

Analyzing the Effect of Working Capital Management on the Profitability of Small Size U.S. Healthcare Companies

Franklin A. Michello* **Tekle O. Wanorie**

Abstract

Our study uses the same methodology as Afeef (2011) to investigate the effect of working capital management on profitability in the U.S. healthcare industry. The study examines small size healthcare companies listed on NASDAQ Stock Exchange between 2009 and 2013. This period was chosen for two reasons: (i) it is post 2008 financial crises in which many companies (including healthcare) witnessed serious liquidity problems, and (ii) changes in reimbursement payments took effect in Medicare and Medicaid provided services as a result of the 2010 Affordable Care Act that affected the healthcare industry in particular. Working capital management has an important effect on the viability and profitability of any healthcare provider such as medical practices, managed care organizations, nursing homes, home care providers, in addition to hospitals. The efficient management of working capital for these small organizations has a profound impact on their survival and profitability than on the performance of larger health care providers since on average 65% of the total assets of small health providers are composed of current assets while on average 59% of the total liabilities are made up of current liabilities. The study obtains two major findings: (i) there is a significant negative relationship between receivables conversion period and profitability (operating profit to sales) which we interpret to mean that the shorter the average number of days accounts receivable remains unpaid, the more profitable are small size healthcare companies. (ii) There is a significant positive relationship between liquidity (Current ratio) and profitability (operating profit to sales). These results suggest that an efficient management of working capital contributes to the profitability of small size healthcare companies.

Key Words: Working Capital Management, Health Care, Liquidity, Profitability, Small Size

I. Introduction

Our study uses the same methodology as Afeef (2011) to investigate the effect of working capital management on profitability in the U.S. healthcare industry. The study examines small size healthcare companies listed on the NASDAQ Stock Exchange between 2009 and 2013. This period was chosen for two reasons: (i) it is post 2008 financial crises in which many companies (including healthcare) witnessed serious liquidity problems, and (ii) changes in reimbursement payments took effect in Medicare and Medicaid provided services as a result of the 2010 Affordable Care Act that affected the healthcare industry in particular. Working capital management has an important effect on the viability and profitability of any healthcare provider such as medical practices, managed care organizations, nursing homes, home care providers, in addition to hospitals. The efficient management of working capital for these small organizations has a profound impact on their survival and profitability than on the performance of larger healthcare providers since on average 65% of the total assets of small health providers are composed of current assets while on average 59% of total liabilities are made up of current liabilities.

Working capital management is a strategy focusing on maintaining an efficient level of both current assets and current liabilities in respect to each other to ensure that a company has

sufficient cash flow in order to meet its short-term debt obligations and operating expenses. The purpose of an efficient working capital management strategy is to oversee the company's liquidity position in order to increase profitability. This study, therefore, aims to examine the potential effects of working capital management on the performance of a set of small size healthcare companies that traded on NASDAQ from 2010 - 2013, a post-recession environment. The study also explores the role unique environmental factors such as changes in payment systems in the healthcare industry contribute to company performance following the passing of the Affordable Care Act in 2010.

Working capital management in the Healthcare industry is different from working capital management in other business undertakings because of the unique nature of the industry in which payments are made by a third party in the form of an insurance company, Medicare or Medicaid. Therefore, healthcare companies face different risk factors that may affect their cash flows. These risks include cost-of-service risk, which results from cost exceeding revenue, risk to reimbursement contract from prospective payment when the bundle of services needed to treat a particular patient is greater than that assumed in the payment amount, risk from an inpatient length of stay that is longer than assumed in the prospective payment amount, risk from prospective payment made on a per diem basis when costs associated with services provided on any day exceed the per diem rate, and risk from capitation whereby a provider is paid a fixed amount per covered life per period regardless of the amount of services provided (Gapenski, 2014). These risks transfer risks from insurers to healthcare companies and hence drastically change their financial landscape and have profound implications for financial decision making. In the past, healthcare providers submitted whatever cost they incurred and were reimbursed for the exact amount. During this time, working capital management was merely a clerical and routine job. Today, however, the industry is witnessing a hostile environment that has forced CFOs in healthcare to rethink how they go about managing their working capital. Therefore, it is crucial that healthcare companies understand the financial risks and their effects on profitability so that they can make every effort to negotiate a level of payment that is consistent with the risks incurred. Another difference relevant to management of working capital of healthcare companies is the different nature of current assets and current liabilities. The largest portion of current assets is accounts and short-term notes receivables from patients less allowance, while the largest current liabilities are accrued salaries payable and accounts payable. Because of this unique feature from other businesses, healthcare companies require special working capital management skills.

The healthcare industry in the U.S. witnessed significant changes in the past few years following the passage of the 2010 Patient Protection and Affordable Care Act, which requires that all citizens purchase health insurance. The act changes provider reimbursements to reward the triple aim: improve quality of care, improve population health outcomes, and lowering costs. In addition, Medicare has specific containment reforms focused at reducing waste and fraud. Thus, payment systems linked to provider accountability and patient outcomes create a new environment for healthcare companies to partner with public health departments on prevention strategies that are demonstrated to reduce costs and improve health outcomes. The specific changes to provider reimbursement include (i) incentivizing primary care (effective January 2013 – December 2014) through payment enhancement for Medicaid primary care providers and 10% bonuses for Medicare primary care providers, (ii) Medicare hospital value-based purchasing program (effective 2013) in which Medicare and Medicaid Services (CMS) reward medical

physicians in eligible acute care hospitals for high quality care for five of the most prevalent conditions – heart failure, pneumonia, surgeries, hospital-related infection, and efficiency and patient satisfaction, (iii) bundled payments for care initiative (effective 1/1/2013) which is a program aimed at developing a more efficient and cost-effective way of paying for healthcare to a growing population of Medicare and Medicaid beneficiaries, (iv) Medicare hospital readmissions reduction program (effective 10/2013) which reduces payments to hospitals that exceed preventable readmissions standards for pneumonia, serious myocardial infarction and heart failure, (v) penalties for hospital-acquired infections (effective 2015) in which the top 25% of hospitals with the highest rates of hospital acquired conditions such as bedsores, complications from extended use of catheters, and injuries caused by falls will face payment penalties of one percent of Medicare payments, and (vi) new models –Center for Medicare and Medicaid Innovation (CMMI) which is funding a range of new models of care that focus on coordination and integration of care and aimed at accomplishing the triple aim of improving quality, population health outcomes and reducing cost of care (Health Resources in Action of Boston, 2014). The effect of these changes in healthcare provider reimbursement is uncertain. While there is a potential benefit to small healthcare companies resulting from the growing pool of insured patients, there is also a possible loss in reimbursements from Medicare and Medicaid stemming from the new payment models. Hence, it is important that small size healthcare companies take into account the impact of these changes in Medicare and Medicaid reimbursements because of their effect on cash flows which in turn affect profitability.

The rest of the study is organized as follows: Section II reviews the literature. Section III presents the objectives of the study. Section IV outlines the testable hypothesis. Section V presents the methodology. Section VI presents the results while section VII concludes the study.

II. Literature Review

Extant literature provides numerous studies that have examined the impact of working capital management on profitability of companies. In this section, we present this work from the most current literature. Pun Thapa (2013) examined the effects of working capital management on profitability in the food and beverages industry from the USA and Canada and found that cash conversion cycle is positively related to profitability and cash flow. However, he also finds that cash conversion cycle is negatively associated with leverage, growth, size, age and fixed assets to total assets ratio. Afeef (2011) analyzed several small and medium-size corporations listed in the Karachi Stock Exchange and concluded that an efficient working capital management does have a substantial impact on their profitability. Sunday (2011) investigated the effectiveness of working capital management in small and medium scale enterprises and found that small firms have weak financial position in that they depend on accounts payable to finance their operations. The dependence on accounts payable as the main source of capital has a negative consequence on their ability to secure funds from financial institutions. In addition, the study revealed that most small businesses in Nigeria face shortage of funds because they hold more current assets than current liabilities. The profound result from this study is that most small businesses in Nigeria last only between two to six years, a condition that may be attributed to poor working capital management. Mohamad and Saad (2010) used Bloomberg's database of 172 listed companies randomly selected from Bursa Malaysia main board for a five-year period from 2003 to 2007. Applying correlations and multiple regression analysis, they found that current assets to total assets ratio showed positive significant relationship with Tobin's Q, ROA and ROI. Cash conversion cycle (CCC), current assets to current liabilities ratio and current liabilities to total

assets ratio illustrate negative significant relations with Tobin's Q, ROA and ROIC. Gill et al., (2010) used a sample of 88 American firms listed on New York Stock Exchange for a period of three years from 2005 to 2007. They found statistically significant relationship between cash conversion cycle and profitability, measured through gross operating profit as in Lazaridis and Tryfonidis's (2006). Uyar (2009) researched the relationship between the cash conversion cycle with firm size and profitability of 166 firms listed on the Istanbul Stock Exchange (ISE) for the year 2007. Firm size measured by total assets and sales revenue, and profitability is measured by return on assets and return on equity. The paper found that Retail/wholesale industry has shorter CCC than manufacturing industry. Another important finding of the study is that the textile industry has the longest CCC. The results showed that there is a significant negative correlation between the length of CCC and firm size. Hence, smaller firms have longer CCC. Lastly, there is a significant negative correlation between the length of CCC and the profitability. Şamiloğlu and Demirgüneş (2008) used a sample consisting of Istanbul Stock Exchange (ISE) listed manufacturing firms for the period 1998-2007. They analyzed 5,843 Firm/quarter data by using a multiple regression model. Their empirical findings show that there is a negative relationship between profitability and accounts receivables period, inventory period, and leverage while there is positive relationship between growth in sales and profitability. Afza and Nazir (2007) found a negative relationship between the profitability measure of firms and degree of aggressiveness of working capital investment and financing policies for 208 public limited companies listed at Karachi Stock Exchange for a period of 1998-2005. They measured Tobin Q and profitability as a firm performance. Tobin Q and profitability produced almost the same results. Lazaridis and Tryfonidis (2006) used a sample of 131 companies listed in the Athens Stock Exchange (ASE) for the period of 2001-2004. They found a significant negative relationship between cash conversion cycle and gross operating profit. The findings reveal that managers can create profit for their companies by handling correctly the cash conversion cycle and keeping each component (accounts receivable, accounts payable and inventory) to an optimal level. Filbeck & Krueger (2005) analyzed working capital management results across industries and found distinct levels of working capital management measures for different industries though such measures tended to significantly change within each industry over time. Among the industries studied, the telecommunications industry and the beverage industry showed the greatest variation on the overall working capital performance measures. Deloof (2003) used a sample of 1009 large Belgian non-financial firms for a period of 1992-1996. He used correlation and regression analysis and found a significant negative relation between gross operating income and the collection period of accounts receivable, average days in inventories and accounts payable of Belgian firms. These results suggest that managers can create value for shareholders by reducing the collection period of accounts receivable and average days in inventories to a reasonable minimum. Jose et al. (2003) tested the corporate returns and cash conversion cycle of 2,718 firms for the period 1974-1993 by using multiple regression analysis. Their results showed that an aggressive liquidity management (lower CCC) is associated with higher profitability for several industries, including natural resources, manufacturing, service, Retail/wholesale, and professional services. Shin and Soenen (1998) studied the relationship between working capital management and profitability of firms. They used Net Trade Cycle (NTC) instead of Cash Conversion Cycle to measure working capital management. The difference is components of CCC are expressed as a percentage of sales in NTC. They found a strong negative relationship between NTC and corporate profitability for a large sample of listed American firms for the periods between 1975 and 1994.

Although the studies above cover many industries and provide ample evidence of the existence of a relationship between working capital management and firm performance, there are few studies focused on the health industry, let alone working capital management in the healthcare industry. Our study extends the work in this important field of finance to the healthcare industry by investigating the relationship between working capital management indicator variables and profitability. To our knowledge, there are no other studies we are aware of that have explored the relationship between working capital management and profitability in the healthcare industry. Two important events provide the background to our study: (i) the 2008 financial crises in which many companies (including those in healthcare) witnessed serious liquidity problems, and (ii) changes in reimbursement payments in Medicare and Medicaid provided services resulting from the 2010 Affordable Care Act that affected the healthcare industry in particular. In the United States, a revenue strapped federal government and many of the states cut the subsidies normally awarded to not-for-profit organizations, of which the majority are healthcare companies. Studies conducted by (Evans, Veach, 2006) addressed the challenges in the healthcare industry. The top and main concerns expressed by two-thirds of hospital chief executive officers were financial challenges followed by personnel shortages. The key financial concern was changes in reimbursements from Medicaid and Medicare and bad debt and losses resulting from their inability to collect amounts owed for services provided. Inevitably, when such sources of revenue on which the healthcare providers depend on are uncertain, they have to figure out how to survive on less. This naturally means cutting costs. It may also mean denying vital services and/or providing a low quality service. Hence, in times like these, the importance of working capital management cannot be overemphasized more so now than ever before. Another important concern for healthcare providers is high rising health care costs. There is ample anecdotal evidence showing that in the United States health care service costs are skyrocketing. In a commentary, Halvorson (2005) pinpointed two issues as healthcare tipping points, cost and quality. This is affecting the employers' bottom lines as well as the beneficiaries in the form of higher deductibles. When costs are rising and the amounts reimbursed are uncertain/reduced this combination only leads to disastrous results unless adequate measures are taken, and shrewd working capital management tools are put in place for healthcare providers to avoid being driven out of business. A third issue healthcare providers have to worry about is that unlike the for-profit companies that sell their services and goods to customers directly at prices set in the competitive marketplace and collect their accounts receivable balances from their customers, healthcare providers have to deal with third-party payers and major health insurers after the services rendered are often determined by a physician, not the customer. As Gapenski (2007) points out, the highly unusual marketplace the healthcare providers deal with has a profound effect on the supply of, and demand for, the services they provide. These not-for-profit companies seek to please multiple stakeholders, such as board of trustees, managers, employees, physicians, creditors, suppliers, patients, potential patients, possibly an entire community. The existence of both private and public insurers complicates the reimbursement system which is the main source of revenue for many small size healthcare companies. These issues imply that effective working capital management is an imperative for these companies to survive.

III. Objectives of the Study

The primary objectives of this study are:

1. To determine whether an empirical relationship between working capital management and profitability of small size healthcare companies listed on the Nasdaq Stock Exchange exists.

2. To analyze the effects of different components of working capital management such as liquidity on profitability of small size healthcare companies listed on the Nasdaq Stock Exchange.
3. To identify and evaluate environmental factors related to the healthcare industry that contributes to profitability of small size health care companies.

IV. Testable Hypothesis

The hypothesis developed for the study is:

H₀: Working capital management has no relevance in determining profitability of small size healthcare companies listed on the Nasdaq Stock Exchange.

H₁: An efficient management of working capital may have a positive and significant relationship with profitability of small size healthcare companies listed on the Nasdaq Stock Exchange.

V. Methodology

This study investigates the relationship between working capital management and profitability of small size healthcare companies listed on the Nasdaq Stock Exchange for a period of four years from 2009 to 2013. The data for the study were obtained from the NASDAQ website (www.nasdaq.com) and from SEC Edgar website (www.sec.gov/edgar/searchadgar/companysearch.html). The data comprises of balance sheet and income statement variables listed in the company annual reports.

a. Sample Size

The size of the final sample used in the study was determined by the availability of complete data on each variable over the entire four-year period. There are 936 small size companies listed on the Nasdaq Stock Exchange of which 181 are health care companies. However, only 53 of the health care companies had complete usable data set for the study, i.e., data for each of year from 2009 to 2013. Hence our final sample was comprised of 212 firm-year observations.

b. Variables Used in the Study

The following variables were used in the study to determine the relationship between working capital management, and profitability and liquidity for firms in the sample:

- Profitability as measured by two variables:
 1. Return on Assets (ROA) = Earnings Before Interest and Taxes / Total Assets
 2. Operating Profit (OPS) = Operating Profit / Net Sales
- Receivables Collection Period (RCP) as measured by the average number of days accounts receivable remains unpaid. It is calculated as $RCP = (\text{Accounts Receivable} / \text{Sales}) \times 365$
- Inventory Conversion Period (ICP) as measured by the average number of days inventory remains unsold. It is calculated as $ICP = (\text{Inventory} / \text{Cost of Revenue}) \times 365$.
- Payables Deferral Period (PDP) as measured by the average number of days it takes the company to pay off its credit purchases. It is calculated as $PCP = (\text{Accounts Payable} / \text{Cost of Revenue}) \times 365$
- Cash Conversion Cycle (CCC) is used to measure the efficiency of working capital management of the health care companies. It is calculated as $CCC = RCP + ICP - PCP$.

To measure the liquidity of health care companies, we use the Current Ratio (CR) which measures the degree to which a company can repay its short-term liabilities. It is calculated as $CR = \text{Current Assets} / \text{Current Liabilities}$.

In our model, we also include the following three control variables that are likely to affect working capital management. The first is the Natural Logarithm of sales, $\text{Ln}(\text{Sales})$ which we use to determine company size. Second is Sales Growth Rate, $SGR = (S_1/S_0) - 1$ which we use to determine the growth in sales from one year to the next. Third and last variable is Financial Leverage, $FL = \text{Total Liabilities} / \text{Total Assets}$ which we use to measure the proportion of total debt obligations.

c. Statistical Tools used in the Study

We utilize SPSS 20 statistical package to carry out our descriptive and quantitative analysis of the data. We use descriptive statistics to determine the mean, standard deviation, minimum, and maximum value of each variable. We also use *Correlation analysis* to assess the relationship between efficient working capital management and profitability and between liquidity and profitability. We use the *Pearson Product Moment Correlation* throughout our study. Our model also includes *Multiple Regression* analyses which we use to help us shed more light on our understanding of the relationship between working capital and profitability and between liquidity and profitability.

d. Regression Model

We use the following multiple regression equation to examine the effect of the working capital management variables on profitability:

$$ROA_{it} = \beta_0 + \beta_1(RCP_{it}) + \beta_2(ICP_{it}) + \beta_3(PDP_{it}) + \beta_4(CCC_{it}) + \beta_5(CR_{it}) + \beta_6(LNS_{it}) + \beta_7(SGR_{it}) + \beta_8(FL_{it}) + \varepsilon$$

where:

ROA_{it} = Return on Assets of firm i at time t ; $i = 1, 2, 3, \dots, 53$ small size health care companies listed on Nasdaq Stock Exchange, and $t = \text{time} = 1, 2, 3, 4$ years

β_0 = Intercept term

RCP = Receivable Collection Period

ICP = Inventory Conversion Period

PDP = Payable Deferral Period

CCC = Cash Conversion Cycle

CR = Current Ratio

LNS = Natural Logarithm of sales

SGR = Sales Growth Rate

FL = Financial Leverage

ε = Error Term

VI. Results

a. Descriptive Statistics

Table 1 provides the descriptive statistics of the pooled data of all the firms in the sample. The statistics include the mean, standard deviation, and maximum and minimum values for each variable.

Table 1: 53 Small Size Health Care Companies Listed on NASDAQ: (2009 – 2013) 212 Firm Year observations

Variables	# of observations	Mean	Std. deviation	Maximum	Minimum
Return On Assets	212	0.0538	0.5424	4.42	-1.47
Operating Profit to Sales	212	-.2499	1.326	.91	-13.35
Receivable Conversion Period	212	84.49	73.13	843	5
Inventory Conversion Period	212	204.42	263.98	3002	10
Payable Deferral Period	212	621.35	2686.94	32785	42
Cash Conversion Cycle	212	-332.43	2483.91	859	-29740
Current Ratio	212	4.47	2.70	23	0
Size (measured by LN Sales)	212	11.91	1.2	15	7
Sales Growth rate	212	.7478	4.30	5.78	-1
Financial Leverage	212	0.43	.58	5.88	.07

The return on assets has a mean value of 5.38% for all the small size health care companies and a standard deviation of 54.24%. The minimum value of return on assets is -147% and the maximum value is 442%.

The mean value of operating profits to sales is -24.99% for all small size health care companies and a standard deviation of 132.6%. The minimum value of operating profit to sales is -1335% and the maximum value is 91%.

Health care companies in the sample on average receive payment from third-party payers such as insurance companies, Medicare and Medicaid in 84.49 days with a standard deviation of 73.13 days. This means that many health care companies deviate to a large extent from their mean value. The minimum number of days in which health care companies receive payment is five days but the maximum is 843 which may mean that companies write off these payments as bad debts and uncollectable.

Health care companies in the sample on average take 204.42 days to sell inventory with a standard deviation of 263.98 days. The minimum period is 10 days, while the maximum is 3002 days.

Health care companies, in the sample, on average take 621.35 to pay their bills with a standard deviation of 2,686.94 days. The minimum period for a health care company to pay back its creditors is 42 days and the maximum is 32,785 days.

The mean value on the cash conversion cycle is -332.43 days with a standard deviation of 2,483.91 days. The minimum value is -29,740 days and a maximum value of 859 days. The average current ratio for the sample is 4.47 with a standard deviation of 2.70. The minimum current ratio is 0 while the maximum current ratio is 23.

To measure the effect of size on profitability, we used the natural logarithm of sales for each health care company as an indicator of firm size. The average mean value of size for all companies is 11.91 with a standard deviation of 1.2. The smallest company in the sample has a natural log of 7 for a year and the largest has a natural log 15.

To analyze the effect of growth in sales on profitability of any company, we computed sales growth as a control variable for each year of the study. The average growth in sales for all the

companies is 74.78% with a standard deviation of 4.30%. The minimum sales growth for any firm during the sample period is -100% with a maximum sales growth of 578%.

We used financial leverage as a control variable to measure the effect of financial leverage on profitability. The average debt ratio or financial leverage is 43% with a standard deviation of 58%. The minimum debt ratio is 7% while the maximum debt ratio is 588%.

b. Correlation Analysis

Table 2 below reports the significance of correlation results between the profitability variables (Return on Assets and Operating Profit to Sales) and the indicators of working capital management and liquidity. Results of the correlation analysis between Receivable Conversion Period and Operating Profit to Sales show a significant negative coefficient of -.312. The p-value is (0.000) which means that the result is significant at 0.01 level. Therefore, we reject the null hypothesis and conclude that working capital management has relevance in determining profitability of small size healthcare companies listed on the NASDAQ stock exchange. The result suggests that in order for small size health care companies to be profitable, they must collect their receivables from insurance companies, Medicare and Medicaid as quickly as possible. However, there is no significant relationship between Receivable Conversion Period and Return on Assets.

We do not find any evidence of a relationship between any profitability indicator variable and Inventory Conversion Period, Payable Deferral Period, and Cash Conversion Cycle and Current Ratio.

c. Regression Analysis

We also run regression analysis to provide further insight into the relationship between variables of working capital management and profitability. We provide these results in Table 3. In Regression Analysis “A”, the working capital management and liquidity indicator variables are regressed against Return on Assets. We run a total of five regression equations to investigate the determinants of ROA for all 212 company-year observations.

Regression 1 explores the relationship between ROA and Inventory Conversion Period. Results show an insignificant negative correlation coefficient of (-0.004).

Regression 2 explores the relationship between ROA and Receivable Conversion Period. Results show an insignificant negative correlation coefficient of (-0.017).

Regression 3 explores the relationship between ROA and Payable Deferral Period. Results show that there is no relationship. The correlation coefficient is (0.000).

Regression 4 explores the relationship between ROA and Cash Conversion Cycle. Results show that there is no relationship. The Correlation coefficient is (0.000).

In regression 5, we exclude all the working capital management indicator variables in order to separately measure the effect of Current Ratio (liquidity) on ROA. The results show an insignificant negative correlation coefficient of (-0.579) between Current Ratio and Return on Assets.

In Regression Analysis B, we regress the indicators of working capital management and liquidity against Operating Profit to Sales. We run a total of five regressions to investigate the determinants of Operating Profit to Sales for all 212 company-year observations. Results of the regressions are shown in Table 4.

Regression 6 explores the relationship between Operating Profit to Sales and Inventory Conversion Period. Results show a positive significant relationship of (0.050). However, the significance level is low as the p-value is (0.075). This means that the result is significant at $\alpha = .01$ level.

Regression 7 explores the relationship between Operating Profit to Sales and Receivable Conversion Period. Results show a significant negative relationship of (-0.2570).

Regression 8 explores the relationship between Operating Profit to Sales and Payable Deferral Period. Results show an insignificant positive relationship of (0.004).

Regression 9 explores the relationship between Operating Profit to Sales and Payable Deferral Period. Results show an insignificant negative relationship of (-0.004).

In regression 10, we exclude all working capital management indicator variables in order to separately measure the effect of liquidity (Current Ratio) on Operating Profit to Sales. The result shows a significant positive relationship (6.571) between liquidity and Operating Profit to Sales. Therefore, we reject the null hypothesis and conclude that liquidity which is an outcome of an efficient working capital management process has relevance in determining profitability of small size healthcare companies listed on the NASDAQ stock exchange

VII. Conclusion and Extensions

The study uses the same methodology as Afeef (2011) to investigate the effect of working capital management on profitability in the U.S. healthcare industry. The study examines small size healthcare companies listed on NASDAQ Stock Exchange between 2009 and 2013. This period was chosen for two reasons: (i) it is post 2008 financial crises in which many companies (including healthcare) witnessed serious liquidity problems, and (ii) changes in reimbursement payments took effect in Medicare and Medicaid provided services as a result of the 2010 Affordable Care Act that affected the healthcare industry in particular. Working capital management has an important effect on the viability and profitability of any healthcare provider such as medical practices, managed care organizations, nursing homes, home care providers, in addition to hospitals. The efficient management of working capital for these small organizations has a profound impact on their survival and profitability than on the performance of larger health care providers since on average 65% of the total assets of small health providers are composed of current assets while on average 59% of the total liabilities are made up of current liabilities. The study obtains two major findings: (i) there is a significant negative relationship between receivables conversion period and profitability (operating profit to sales) which we interpret to mean that the shorter the average number of days accounts receivable remain unpaid, the more profitable are small size healthcare companies. (ii) There is a significant positive relationship between liquidity (Current ratio) and profitability (operating profit to sales). These results

suggest that an efficient management of working capital contributes to the profitability of small size healthcare companies and is vital to their survival.

The findings above have encouraged us to pursue a follow-up or extension of this study with a focus on NASDAQ listed large healthcare companies. We feel that large healthcare companies are better positioned to manage the impact of the 2008 financial crises and the effects of changes in reimbursement payments from Medicare and Medicaid resulting from the 2010 Affordable Care Act. The follow-up study will enable us to document the evidence and allow us to examine the specific methods and techniques they use to manage their working capital.

Table 2: Correlation Matrix

		ROA	OPS	RCP	ICP	PDP	CCC	CR	LNS	SG	FL
ROA	Pearson Correlation	1	.278**	-.060	-.054	-.044	.040	-.024	.177**	-.049	-.126
	Sig. (2-tailed)		.000	.381	.436	.528	.566	.727	.010	.476	.067
	N		212	212	212	212	212	212	212	212	212
OPS	Pearson Correlation		1	-.312**	.006	-.043	.038	.037	.602**	.023	-.079
	Sig. (2-tailed)			.000	.934	.530	.579	.595	.000	.742	.253
	N			212	212	212	212	212	212	212	212
RCP	Pearson Correlation			1	.078	-.009	.048	.093	-.314**	-.037	-.107
	Sig. (2-tailed)				.257	.892	.488	.177	.000	.593	.120
	N				212	212	212	212	212	212	212
ICP	Pearson Correlation				1	.798**	-.754**	-.021	-.145*	-.025	.122
	Sig. (2-tailed)					.000	.000	.758	.035	.716	.077
	N					212	212	212	212	212	212
PDP	Pearson Correlation					1	-.997**	-.088	-.170*	-.002	.111
	Sig. (2-tailed)						.000	.202	.013	.971	.108
	N						212	212	212	212	212
CCC	Pearson Correlation						1	.096	.159*	-.001	-.110
	Sig. (2-tailed)							.165	.020	.988	.111
	N							212	212	212	212
CR	Pearson Correlation							1	-.144*	-.073	-.231**
	Sig. (2-tailed)								.036	.289	.001
	N								212	212	212
LNS	Pearson Correlation								1	.026	-.123
	Sig. (2-tailed)									.708	.074
	N									212	212
SG	Pearson Correlation									1	.138*
	Sig. (2-tailed)										.045
	N										212
FL	Pearson Correlation										1
	Sig. (2-tailed)										
	N										

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 3: Linear Regressions for Sample of Firms with “Return on Assets” as dependent Variable

Regression Analysis A: Linear Regressions for sample Firms						
Dependent Variable: Return on Assets						
53 Small Size Health Care Companies Listed on NASDAQ (2009 – 2013), 212 Firm-Year Observations						
Variables		Regress 1	Regress 2	Regress 3	Regress 4	Regress 5
Intercept	B0	-.7188	-.6848	-.7326	-.7356	-.7408
	p-value	(0.079)	(0.120)	(0.074)	(0.072)	(0.065)
CR	B5	-.586	-.573	-.593	-.589	-.579
	p-value	(0.683)	(0.689)	(0.680)	(0.682)	(0.686)
FL	B8	-.099	-.104	-.100	-.100	-.101
	p-value	(0.145)	(0.127)	(0.137)	(0.137)	(0.134)

LNS	B6	7.164	6.942	7.266	7.245	7.283
	p-value	(0.025)	(0.039)	(0.025)	(0.024)	(0.022)
SG	B7	-.005	-.005	-.005	-.005	-.005
	p-value	(0.549)	(0.554)	(0.555)	(0.555)	(0.555)
ICP	B2	-.004	-	-	-	-
	p-value	(0.776)	-	-	-	-
RCP	B1	-	-.017	-	-	-
	p-value	-	(0.753)	-	-	-
PDP	B3	-	-	0.000	-	-
	p-value	-	-	(0.917)	-	-
CCC	B4	-	-	-	0.000	-
	p-value	-	-	-	(0.942)	-
Adjusted R- Square		0.022	0.022	0.022	0.022	0.026
F – Statistic		1.951	1.938	1.936	1.935	2.429

Table 4: Linear Regressions for Sample of Firms with “Operating Profits to Sales” as dependent Variable

Regression Analysis b: Linear Regressions for sample Firms						
Dependent Variable: Operating Profits to sales						
53 Small Size Health Care Companies Listed on NASDAQ (2009 – 2013), 212 Firm Year Observations						
Variables		Regress 6	Regress 7	Regress 8	Regress 9	Regress 10
Intercept	B0	-9.057	-7.938	-8.995	-8.974	-8.787
	p-value	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CR	B5	6.662	6.653	6.934	6.954	6.571
	p-value	(0.018)	(0.018)	(0.015)	(0.015)	(0.021)
FL	B8	0.038	0.015	0.050	0.051	0.062
	p-value	(0.774)	(0.907)	(0.703)	(0.701)	(0.638)
LNS	B6	70.41	63.787	70.406	70.311	68.952
	p-value	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SG	B7	0.005	0.004	-.004	0.004	0.004
	p-value	(0.767)	(0.833)	(0.805)	(0.808)	(0.820)
ICP	B2	0.050	-	-	-	-
	p-value	(0.075)	-	-	-	-
RCP	B1	-	-.257	-	-	-
	p-value	-	(0.015)	-	-	-
PDP	B3	-	-	0.004	-	-
	p-value	-	-	(0.182)	-	-
CCC	B4	-	-	-	-0.004	-
	p-value	-	-	-	(0.186)	-
Adjusted R- Square		0.388	0.382	0.369	0.369	0.367
F – Statistic		26.126	27.036	25.675	25.663	31.524

References

- Afeef, M. (2011). “Analyzing the Impact of Working Capital Management on the Profitability of SME’s in Pakistan”. *International Journal of Business and Social Science*, Vol. 2, No. 22, 173-183.
- Afza, T & Nazir, M. (2007). “Working Capital Management Policies of Firms: Empirical Evidence from Pakistan”. Presented at 9th South Asian Management Forum (SAMF) on February 24-25, North South University, Dhaka, Bangladesh.
- Deloof, M. (2003). “Does Working Capital Affect Profitability of Belgium Firms?” *Journal of Business, Finance and Accounting*, Vol. 30, No. 3:573-587.
- Evans, M. (2006). “What Really Matters Most.” *Modern Healthcare*, January, 2006 (<http://www.modernhealthcare.com/article/20060109/NEWS/601090310>).

- Filbeck, G & Krueger, T. (2005). “An Analysis of Working Capital Management Results Across Industries”. *Mid-American Journal of Business*. Vol. 20, No. 2:11-18.
- Gapenski, L. C. (2007). *Understanding Healthcare Financial Management*. Chicago: Health Administration Press.
- Gill, A., Nahum, B., Mathur, N. (2010). "The Relationship between Working Capital Management and Profitability: Evidence from the United States," *Business and Economics Journal*, Vol. 2010: BEJ – 10: 1-9.
- Halvorson, G. (2005). “Healthcare Tipping Points.” *Healthcare Financial Management* (March): 74-80.
- Jose, M, Lancaster, C, & Stevens, J. (1996). “Corporate Returns and Cash Conversion Cycles.” *Journal of Economics and Finance*, Vol. 20, No. 1: 33-46.
- Lazaridis, I. & Tryfonidis, D. (January-June 2006). “The Relationship between Working Capital Management and Profitability of Listed Companies in the Athens Stock Exchange.” *Journal of Financial Management Analysis*, Vol. 19, No. 1: 26-35.
- Mohamad, N. & Saad, N. (2010). “Working Capital Management: The Effect of Market Valuation and Profitability in Malaysia. *International Journal of Business Management*, Vol. 5, No. 11: 140-147.
- Pun Thapa. Priya Darshini (2013). “How Does Profitability Get Affected by Working Capital Management in Food and Beverages Industry?” *Journal of Advanced Research in Management*. Vol. 2, No. 8:79-88.
- Samiloglu, F. & Demirgunes, K. (2008). “The Effect of Working Capital Management on Firm Profitability: Evidence from Turkey.” *The International Journal of Applied Economics and Finance*, 2: 44-50.
- Shin, H. and Soenen, L. (1998). “Efficiency of Working Capital Management and Corporate Profitability.” *Financial Practice and Education*, 8:37-45.
- Sunday, K. J. (2011). “Effective Working Capital Management in Small and Medium Scale Enterprises (SMEs)”. *International Journal of Business and Management*, Vol. 6, No. 9:271-279.
- Uyar, A. (2009). “The Relationship of Cash Conversion Cycle with Firm Size and Profitability: an Empirical Investigation in Turkey.” *International Research Journal of Finance and Economics*, ISSN 1450-2887, Issue 24, Euro Journals Publishing, Inc., 186-193.
- Veach, M., (2006). “What is on Your Plate? Ten Top Issues for 2006.” *Healthcare Financial Management*, January 2006.

Authors

Prof. Franklin A. Michello*

Professor, Department of Economics & Finance, Middle Tennessee State University, Murfreesboro, Tennessee, U.S.A., frank.michello@mtsu.edu

Tekle O. Wanorie

Associate Professor, Department of Business, Northwest Missouri State University, tekleow@nwmissouri.edu

*Corresponding author