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The impact of working capital management to profitability of chemicals companies listed on the Vietnamese stock market

Dinh The Hung[1] ✉
Ngo Anh Thu[2]

[1]*National Economics University, Vietnam.*
Email: hungdt@neu.edu.vn
[2]*The American School, Vietnam.*
Email: elenango02052007@gmail.com
(✉ Corresponding Author)

Abstract

Working capital plays an important role in ensuring business continuity. Effective management of working capital will directly affect the success of the business. In contrast, poor management will lead to a lack of financial ability, difficulty in payment, reduced sales leads to reduced profits. This paper examines the impact of working capital management on the profitability of chemical companies listed on the Vietnamese stock market. Data sources used in the analysis are from the financial statements of 32 chemical companies listed on Hanoi and Hochiminh City Stock Exchange form 2019 to 2023. Through the results of SPSS 20, the authors assessed the impact of working capital management to profitability and recommendations to improve working capital management of chemical companies listed on the stock market of Vietnam.

Keywords: Chemical companies listed, Profitability, Working capital management, Working capital.
JEL Classification: D40; F21.

1. Introduction

Working capital plays an important role in ensuring the continuity of business operations. Effective management of Working capital resources such as receivables, payables, inventory... will directly impact the success of the business. On the contrary, poor management will lead to financial shortages, making it difficult to pay and can cause sales to decline, leading to reduced profits. Therefore, Working capital management and profits are closely related to each other.

Chemicals are an industry that plays an important role in economic development, providing input materials for many essential industries serving production and consumption such as fertilizers, pesticides, and detergents, paint... The chemical industry in the coming years is likely to increase, this shows that the importance of the chemical industry in Vietnam is increasingly being emphasized. Although we have not encountered many difficulties in capital management because the potential market is being exploited, in the long run it will be inevitable that as the number of businesses in the same industry increases, the market share will increase divided, the cost of differentiation increases.

The article aims to understand and research how the components of Working Capital affect the profitability of chemical enterprises on the Vietnamese stock market. Research data was taken from the financial statements of 32 chemical enterprises listed on the Vietnamese stock market in the period 2019-2023. From there, recommendations for Working Capital management to increase improve business efficiency of chemical enterprises. Thereby contributing to increasing profitability, while promoting the competitiveness of chemical enterprises in the market.

2. Literature Review

Deloof (2003) studied the impact of working capital management on the profits of 1,009 non-financial enterprises in Belgium during the period 1992-1996. The author uses the Gross Profit variable to measure profitability and uses variables to measure Working Capital management such as: Average collection period (ACP), Inventory turnover period (DIH), Average debt payment period (AP) and Cash conversion cycle (CCC). In addition, the author also uses control variables: Revenue size, Revenue growth, Debt ratio (DR). Research shows that there is an inverse relationship between gross profit and ACP and DIH. From there, the author makes recommendations to financial managers to improve profit levels by reducing ACP, DIH and increasing AP.

Safi Ullah Khan et al (2005) studied the impact of Working Capital management on the profitability of listed enterprises in Pakistan. Relevant data are taken from the financial statements of 296 randomly selected listed enterprises from all major sectors of the economy except financial enterprises with 2933 observations over the period 1995-2004 . The linear regression research model uses dependent variables to measure business performance: Gross Profit (GOP) and Net Profit from Business Activities (NOP). The independent variables and control variables are listed the same as in Deloof's (2003) study. Research results show that ACP has a positive relationship; DIH, AP, CCC have negative relationships with GOP and NOP.

Mathias B. Baveld (2012) researched and investigated listed enterprises in the Netherlands, with a sample of 37 enterprises with the goal of analyzing the impact of working capital management on profitability during the financial crisis. The author analyzes the impact of components of Working Capital on profits through two representative factors: Return on total assets (ROA) and Gross profit (GOP). Working Capital management variables: ACP, AP, DIH, CCC; Control variables: Company size (SIZE), Debt ratio (DEBT), Growth rate (GROWTH), Current ratio (CR), Fixed asset structure (FATA). The results of this study indicate that in times of crisis, enterprises do not need to change their Working Capital management policies related to accounts payable and inventory, if the goal is to increase profitability. Accounts receivable need to change because during a crisis accounts receivable have a positive impact on the company's profits in the coming year.

Research by Nguyen Thi Viet Thuy (2012) on the impact of working capital management on profitability and market value of joint stock enterprises in Vietnam. The research sample includes 173 enterprises in the period 2009 - 2011 with 519 observations. In the research model, the author uses the dependent variables as: Market value of the company (Tobin Q); Return on assets (ROA); Return on invested capital (ROIC). And variables measuring Working Capital management: DSO, DIH, DPO, CCC; Control variables: DTA (liabilities/total assets), CLTAR (current liabilities/total assets), CATAR (current assets/total assets), CR. Research results show that there is a relationship between the component variables of Working Capital and profit indicators: AR, DIH, CCC have a negative relationship with ROA and ROIC. On the contrary, AP has a positive relationship. The study also shows that there is no notable relationship between Working Capital management and market value.

Mhs Anas Husaria (2015) researched and investigated the relationship between Working Capital management and profitability of businesses in the Middle East and Western Europe. The study uses a sample of 54 listed enterprises in the Middle East and Western Europe. The author's purpose is to examine the effectiveness of Working Capital management on profits. The author included in the model the independent variables of Working Capital management: RTD, PTD, ITD, CCC; Controlled variables: SIZE, DEBT, GROWTH. The results of this study show that there is no statistical significance in the relationship between the components of Incoming Working Capital and the profitability of the business (the representative factor is ROA). Furthermore, managers should use other tools and strategies to improve business profitability than effective Working Capital management.

Dinh Thi Hong Tham (2015) conducted in-depth research with a sample of 49 listed construction materials enterprises in the period 2009 - 2013 with 231 observations to evaluate the impact of Working Capital management on profitability. The author analyzes the relationship between Working Capital management and three representative indicators: ROA, ROE and TOBINQ. In addition to the familiar variables that have appeared, here the author adds to the model a control variable: State ownership ratio (STATE). The results show that there is no relationship between ACP, AP and TOBINQ; DIH and ROA, TOBINQ have a negative relationship, but have no relationship with ROE; CCC has a negative impact on TOBINQ. Companies should reduce payment time to suppliers and reduce CCC to increase sustainable competitive advantage and business profitability.

Frederico Robles (2016) studies the impact of Working Capital management on profitability in different types of enterprises in the UK. The author analyzes the impact of each business cycle on Working Capital management on profitability, using a sample of 400 unlisted enterprises in the period 2006 - 2014. The author included in the model the independent variables of Working Capital management: AR, AP, DIH, CCC; Control variables: CR, DEBT, SALES. The results show that the impact of Working Capital management on profitability (the representative factor here is: ROA) is higher, specifically: There is a positive relationship between AP and ROA and a positive relationship between AP and ROA. negative relationship between AR, DIH, CCC and ROA.

Vuong Duc Hoang Quan and Duong Diem Kieu (2016) on the impact of working capital management on the profits of enterprises listed on the Hochiminh City Stock Exchange (HOSE). With a sample of 29 enterprises in 4 industries: pharmaceuticals, food, seafood, and steel in the period 2010 - 2014. The study's multivariate regression model includes 9 independent variables (Working capital variables: ACP, DPO, DIH, CCC; control variables: CA/TA, K, D/A, CL/TA, Ln_S) impact ROA. The results shown through analyzing the regression model separately for each industry is that the impact of Working Capital on profits for the 4 research industries is very different.

3. Theoretical Basis of Working Capital and Working Capital Management

3.1. Working Capital

To ensure that the production and business process is conducted regularly and continuously, enterprises are required to have a certain amount of current assets. Therefore, to form current assets, enterprises must advance a certain amount of monetary capital to invest in that asset. This amount of capital is called the Working Capital of the enterprises.

According to the Corporate Finance Textbook (Academy of Finance, 2014): "A business's working capital is the entire amount of advance money that the enterprises spends to invest in forming frequently needed current assets for production and business activities of the enterprise. In other words, Working Capital is the monetary expression of current assets in an enterprise".

Working capital is a financial measure that represents the current liquidity of a enterprise, measures the financial strength of a enterprise, and it plays an important role in maximizing the wealth of shareholders. . However, it needs to be financed and may entail other operating costs, such as credit losses on accounts receivable, storage costs, and logistics costs for inventory. Along with tangible and intangible assets, Working Capital is also a part of operating capital. If the amount of Working Capital is not guaranteed, it will lead to a shortage and difficulty in daily business operations.

Working capital is determined as follows: Working capital = Current assets – Short-term liabilities

Current assets here are specifically understood as: cash, cash equivalents; short-term receivables; inventory; other current assets. Short-term debts are debts with a term of 1 year or less (payables to suppliers, due debts to financial institutions). If current assets are less than current liabilities, the business will lack Working Capital, also known as a Working Capital deficit.

3.2. Working Capital Management

Decisions related to Working Capital and short-term finance are called Working Capital management. In other words, Working Capital management includes all aspects of current assets and short-term liabilities. The focus of Working Capital management is to optimize the levels of inventory, accounts receivable, cash and other current assets held by the business enterprise at a point in time. It shows the relationship between a business's current assets and current liabilities. The goal of Working Capital management is to ensure that a business can continue its operations and has sufficient cash flow to meet both short-term debt due and upcoming expenses.

Working Capital Management needs to answer several important questions that affect a company's sustainability and shape its financial strategy, both in the short and long term: How much cash and inventory should we hold? Inventory on hand? Should the credit period be extended to customers? Is the same case with the payment period to suppliers? Is it necessary to mobilize short-term finance from any sources and what is the debt repayment plan?

4. Research Methods

4.1. Research Sample

To determine the impact of Working Capital management on the profitability of chemical enterprises, the authors collected secondary data taken from the annual financial reports of listed chemical enterprises on the Vietnamese stock market. The research sample includes 32 enterprises out of a total of 107 joint stock enterprises operating in the chemical manufacturing industry, including 16 enterprises listed on HNX; 16 businesses listed on HOSE. The study period is 5 years (2019 - 2023) with a total of 160 observations.

4.2. Building Models and Research Hypotheses

4.2.1. Research Framework

Based on an overview of previous studies, the authors selected the variables to measure Working Capital management as: Average collection period (ACP), Inventory turnover period (DIH), Debt average payment period (DPO), Cash conversion cycle (CCC) to consider the impact of these variables on the dependent variable which is the profitability of the enterprise.

The chemical industry in Vietnam is in the process of development, investment in building production lines, factories, and warehouses is top priority, fixed assets are increasing rapidly, leading to an increase in loans finance. The question here is whether enterprises can balance working capital to meet business needs? How does working capital management impact profitability on total assets because chemical enterprises have to use many assets in their operations? For this reason, the authors decided to choose the variable Return on Assets (ROA) as the variable reflecting profitability. Furthermore, the chemical industry still has many potential markets, so the authors ignore the variable Return on Equity (ROE). The authors decided to include in the analysis control variables: Current Ratio (CR), Debt Ratio (DR) and Enterprise Size (SIZE). Below is a Figure showing the impact of variables on profitability:

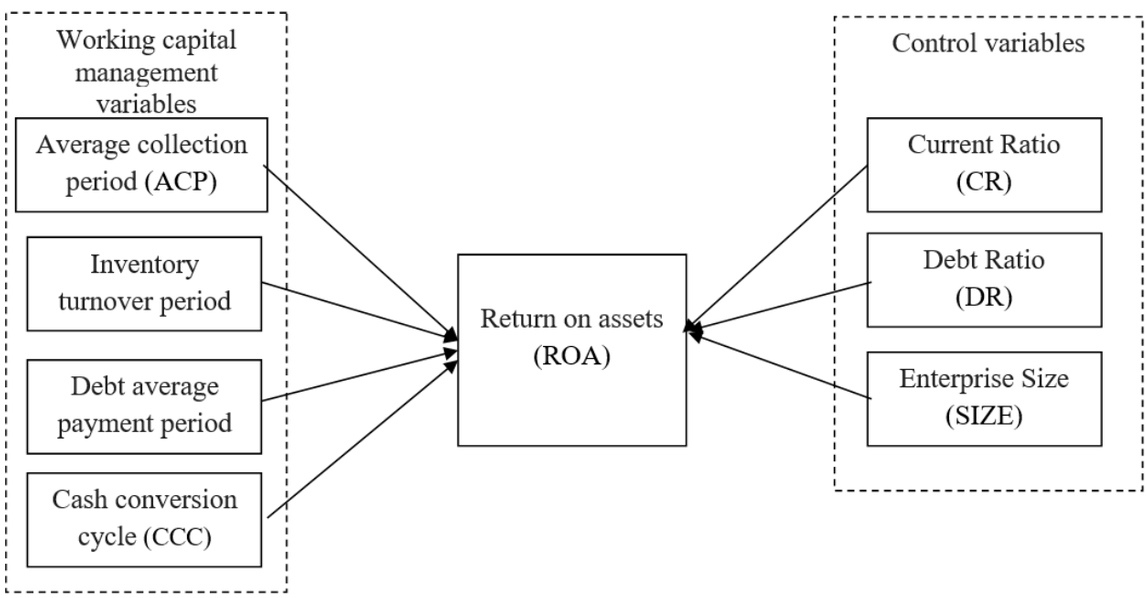

Figure1. Model to study the impact of factors on working capital.

4.2.2. The Content Describes the Variables, Measurement Methods and Research Hypotheses

a. Dependent Variable:

Return on Assets (ROA): This indicator shows the efficiency of using assets in business activities, it shows how much profit each dong of assets used brings. The higher the ratio shows the more efficient the enterprises is operating. Case studies: Wang (2002); Padachi et al (2006); Garcia-Teruel & Martinez-Solano (2007); Samiloglu & Demirgunes (2008); Nazir & Afza (2009) and Shama & Kumar (2011)... used this ratio as a variable to study the impact of Working Capital management.

Calculation formula: ROA = Profit after tax/Total Assets

b. Independent Variable

- Average collection period (ACP): is an index indicating the average number of days to collect a enterprise's receivables. If this ratio is low, the company only needs a few days to recover money from customers and vice versa. Therefore, a negative sign is expected between ACP and ROA. Studies on this variable include: Deloof (2003), Mkhululi Ncube (2011) and Jião Serrasqueiro (2014)... have shown that it has an impact on the Return on Assets.

Calculation formula: Average collection period = (Receivables / Budget) * 365

Research hypothesis: Ho1: There is a relationship between ACP and ROA.

- Inventory turnover period (DIH): This indicator reflects the number of days to perform an inventory turnover during the year. The lower the inventory turnover period, the better the enterprise is. Expectations for the relationship between DIH and ROA are inverse. Previous studies: Deloof (2003); Padachi et al. (2006); Mhd Anas Husaria (2015) and Nguyen Thi Viet Thuy (2012)... have shown that there is an impact on the ROA.

Calculation formula: Inventory turnover period = (Inventory / Cost price) * 365

Research hypothesis: Ho2: There is a relationship between DIH and ROA.

- Average payables payment period (DPO): This index shows the average number of days it takes a enterprises to pay the seller. A high coefficient shows a good relationship between the enterprise and the seller. A low coefficient shows that enterprises have to pay sellers in a short time, leading to an imbalance in working capital management. The expected sign in the relationship between DPO and ROA is negative. Previous studies: Frederico Robles (2016); Mhd Anas Husaria (2015); Dinh Thi Hong Tham (2015)... have shown an impact on the ROA.

Calculation formula: Liabilities payment period = (Average liabilities/Cost price) *365

Research hypothesis: Ho3: There is a relationship between DPO and ROA.

- Cash conversion cycle (CCC): This index measures the time it takes to invest in Working Capital until cash is recovered from sales revenue. The higher this index shows the time capital resources are invested in high working capital, leading to scarcity of payment resources. If this number is small, it can be assessed as good working capital management ability. The expected sign for the relationship between CCC and ROA is negative. Previous studies: Safi Ullah Khan et al (2005); Mathias B. Baveld (2012) and Jião Serrasqueiro (2014),... have shown an impact on the ROA.

Calculation formula: CCC = ACP + DIH – DPO

Research hypothesis: Ho4: There is a relationship between CCC and ROA.

c. Control variable

- Current ratio (CR): This index shows the solvency of a enterprise in the short term, reflecting whether the enterprise has enough ability to pay short-term debts with short-term assets. This index is greater than 1, indicating good short-term solvency of the enterprise. On the contrary, if this index is less than 1, it shows that the enterprise cannot ensure its solvency. Previous studies: Frederico Robles (2016) and Mathias B. Baveld (2012)

Calculation formula: Current ratio = Current assets / Short-term liabilities

- Debt ratio (DR): This ratio shows what percentage of a business's assets are from debt. If a business has a low ratio, it has a high ability to repay debt; on the contrary, a high ratio is an alarming point in managing the enterprise's business capital because of the higher level of risk. Previous studies: Nguyen Thi Viet Thuy (2012), Vuong Duc Hoang Quan and Duong Diem Kieu (2016)...

Calculation formula: Debt Ratio = Total debt/Total assets

- Enterprise size (SIZE): This index shows the scale of the enterprise. Larger scale shows that business operations are favorable, increasing revenue, thereby increasing profits. This variable has been studied by Dinh Thi Hong Tham (2015).

Calculation formula: Enterprise size = Ln (Total assets)

4.3. Build A Research Model

The authors use a multivariate regression research model to study the impact of Working Capital management on profitability. The authors built 2 separate research regression models because the CCC variable is formed from 3 variables ACP, DIH, DPO (CCC = ACP + DIH – DPO) so that when putting data through analysis software variables were not removed from the model for multicollinearity reasons. In addition, analyzing the impact on the two models helps managers make decisions and policies that will not be too misleading. Businesses can adjust the ACP, DIH, and DPO indexes, but the CCC index remains at the allowable level.

Model 1:

$$ROA = \beta_{01} + \beta_{11}.ACP + \beta_{21}.DIH + \beta_{31}.DPO + \beta_{41}.CR + \beta_{51}.DR + \beta_{61}.SIZE + \varepsilon_1$$

Model 2:

$$ROA = \beta_{02} + \beta_{12}.CCC + \beta_{22}.CR + \beta_{32}.DR + \beta_{42}.SIZE + \varepsilon_2$$

5. Analyze and Discuss Research Results

5.1. Statistical Analysis Describes the Variables

The authors put the data set collected from 32 chemical enterprises in the period 2019 – 2023 with a total of 160 observations into SPSS analysis software to run descriptive statistics and obtain results as shown in the table below:

Table 1. Descriptive statistics of variables in the regression model.

Descriptive statistics					
	N	Min.	Max.	Average	Standard deviation
ROA	160	-0.046	0.266	0.110	0.057
ACP	160	1.605	539.056	64.340	71.994
DIH	160	3.992	308.291	99.687	56.082
DPO	160	6.451	382.536	139.218	68.022
CCC	160	-260.371	241.751	24.809	79.149
CR	160	0.512	6.897	2.246	1.181
DR	160	0.109	0.758	0.407	0.161
SIZE	160	10.888	16.622	13.430	1.286
Valid N (Listwise)	160				

From the data table above, it can be seen that:

- Average collection period (ACP) has an average of 64,340 days with a standard deviation of 71,994 days. The above average value is appropriate because normally invoices for sales of goods and services will have a payment term of 15 to 60 days.
- The average Inventory turnover period (DIH) is 99,687 days with a standard deviation of 56,082 days. The above average period corresponds to one quarter (3 months), which is a suitable period for chemical-related products.
- The average Debt payment period (DPO) is 139,218 days on average, ranging from 6,451 days to 382,536 days. Fast or slow payment will depend on the financial situation and management policy of the business.
- The average Cash Conversion Cycle (CCC) is 24,809 days, meaning the time period from investment in Working Capital to the time of cash recovery from sales revenue is short. This also demonstrates good Working Capital management ability, because this index is calculated from the 3 aforementioned indexes: ACP, DIH and DPO.
- The average Current ratio (CR) is 2.246, this index is greater than 1, showing that the short-term solvency of businesses is in good condition.
- The average Debt ratio (DR) is 0.407 (40.7%), in the capital structure of the enterprise, 40.7% is borrowed capital and 59.3% is total assets. This means that businesses can still utilize their assets to invest in other areas to earn higher profits.
- The average Enterprise size (SIZE) is 13,430, suitable for enterprises in developing countries like Vietnam.

5.2. Analyze Correlations Between Variables

The correlation coefficient between variables shows the relationship between variables. We will evaluate the correlation through the Pearson coefficient (r) with a significance level of 5% (sig≤0.05).

Table 2. Correlation coefficients between variables in the model.

Correlation coefficient								
	ROA	ACP	DIH	DPO	CCC	CR	DR	SIZE
ROA	1	-0.313**	-0.022	-0.410**	0.052	0.297**	-0.466**	0.133
ACP		1	-0.068	0.493**	0.437**	0.101	-0.109	0.041
DIH			1	0.172*	0.499**	0.221**	-0.250**	-0.009
DPO				1	-0.289**	-0.342**	0.307**	0.143
CCC					1	0.543**	-0.540**	-0.091
CR						1	-0.818**	0.214**
DR							1	-0.122
SIZE								1

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

From the table above, we see that ROA is positively correlated with CCC, CR, and SIZE, but this relationship is not statistically significant at the 5% level, because CCC has P-value = 0.51 and SIZE has P-value. = 0.09; As for CR, the correlation is statistically significant at the 1% level. ROA is negatively correlated with ACP, DPO, and DR with statistical significance at the 1% level; with DIH is not statistically significant at the 5% level, because P-value = 0.78.

ACP is positively correlated with the DPO and CCC at the 1% significance level and increasing ACP will increase DPO and CCC; Other variables are not statistically significant because P-value>0.05.

DIH is positively correlated with DPO and CR at the 5% significance level; with CCC at the 1% significance level; Increasing the number of days of inventory will increase DPO and CCC. DIH is negatively correlated with the DR at the 1% significance level.

DPO is positively correlated with ACP, DR at the 1% significance level, with DIH at the 5% level, and with SIZE at the 10% significance level; Increasing DPO will increase ACP and DIH. DPO is negatively correlated with CCC and CR at the 1% level; CCC decreases with increasing DPO.

CCC is positively correlated with ACP, DIH, CR at the 1% level; Increased CCC increases ACP and DIH. CCC is negatively correlated with DPO, DR at the 1% level, with SIZE at the 10% level.

CR is positively correlated with ACP, DIH, CCC, SIZE with the corresponding P-value: 0.20; 0.01; 0.00; 0.01. CR is negatively correlated with DPO, DR with P-value respectively: 0.00; 0.00.

DR is positively correlated with DPO at the 1% level. DR is negatively correlated with ACP, DIH, CCC, CR, SIZE with the corresponding P-value: 0.17; 0.00; 0.00; 0.00; 0.13.

SIZE is positively correlated with ACP, DPO, and CR with P-values of: 0.60; 0.07; 0.01. SIZE is negatively correlated with DIH, CCC, DR with P-value respectively: 0.91; 0.25; 0.13.

5.3. Analyze Regression Models

The authors conducted regression analysis according to the two proposed models to test the relationship.

5.3.1. Model 1

$$ROA = \beta_{01} + \beta_{11}.ACP + \beta_{21}.DIH + \beta_{31}.DPO + \beta_{51}.CR + \beta_{61}.DR + \beta_{71}.SIZE + \varepsilon_1$$

Table 3. Results of running model 1.

Model summary[b]					
Model	**R**	**R squared**	**Adjusted R squared**	**Random errors**	**Durbin-Watson**
1	0.650[a]	0.423	0.400	0.0443935	1.105

Note: a. Predictors: (Constant), SIZE, DIH, ACP, DR, DPO, CR
b. Dependent variable: ROA

Table 4. Model 1 regression results.

Coefficients[a]								
Model		**Unstandardized regression coefficient**		**Standardized regression coefficient**	**T**	**Sig.**	**Collinearity Statistics**	
		B	**Std. error**	**Beta**			**Tolerance**	**VIF**
1	(Constant)	0.211	0.044		4.744	0.000		
	ACP	0.000	0.000	-0.304	-3.760	0.000	0.577	1.732
	DIH	0.000	0.000	-0.129	-1.812	0.072	0.748	1.337
	DPO	0.000	0.000	-0.145	-1.586	0.115	0.449	2.229
	CR	-0.016	0.006	-0.328	-2.855	0.005	0.286	3.491
	DR	-0.262	0.039	-0.737	-6.746	0.000	0.316	3.161
	SIZE	0.006	0.003	0.145	2.184	0.030	0.852	1.173

Note: a. Dependent Variable: ROA

From Table 3, we see that the Durbin Watson index is 1.105 (1<d<3), so there is no autocorrelation phenomenon in model 1. The model can explain 40% of the variation in ROA (due to The adjusted R squared is 0.400) so the 6 independent and control variables influence 40% of the change in the dependent variable, the remaining 60% is due to other factors and random errors.

From Table 4, the VIF values of the variables ACP, DIH, DPO, CR, DR, SIZE are all less than 10. In addition, the research data does not contain questionnaires using the Likert scale, so in regression model 1 Multicollinearity does not occur. With a significance level of 5%, corresponding to Sig values. of the variables in the model ACP, DIH, DPO, CR, DR, SIZE are: 0.000; 0.072 (>0.05); 0.115 (>0.05); 0.005; 0.000; 0.030. From there, we eliminate from the regression model the variables with Sig. >5% are: DIH, DPO. Based on the unstandardized regression coefficient (β) in the table above, we can rewrite regression model 1 in unstandardized form as follows:

$$ROA = 0.211 + 0.000\ ACP - 0.016\ CR - 0.262\ DR + 0.006\ SIZE$$

The β coefficient of the ACP variable has a small value, the DIH and DPO indices are eliminated because they are not meaningful at the 5% significance level. In the above equation, the variables retain their original units. The unstandardized regression equation has more mathematical meaning than economic meaning as it only reflects the change in the dependent variable when each independent variable changes under the condition that the remaining independent variables must be fixed.

If considered at the 10% significance level, the variables DIH and DPO also have the same impact on profitability (βDIH = 0.000; βDPO = 0.000) with an insignificant level of influence.

Model 1, after regression analysis, has one remaining variable, ACP, which has a relationship with ROA at the 1% significance level. ACP affects ROA in the same direction, meaning that under the condition that other variables do not change, increasing the average number of days of collection will increase profitability. The β coefficient of ACP according to the table above is 0.000. When ACP increases by 1 day, ROA increases by 0.000 (or 0.0%). Thus, it can be said that the impact of the number of days of collection does not have too great an impact on profitability.

If we consider the standardized regression coefficient (βeta), we have the following standardized regression equation:

$$ROA = -0.304\ ACP - 0.328\ CR - 0.737\ DR + 0.145\ SIZE$$

In the standardized regression equation, the variables have been regressed to the same unit. Furthermore, the standardized regression model is more economic than mathematical. Here, the impact of the variables on ROA is listed in descending order as: DR (0.737); CR (0.328); ACP (0.304); SIZE (0.145).

Table 5. Results of running model 2.

Model summary[b]					
Model	**R**	**R squared**	**Adjusted R squared**	**Random errors**	**Durbin-Watson**
1	0.535[a]	0.286	0.268	0.0490483	1.058

Note: a. Predictors: (Constant), SIZE, CCC, DR, CR
b. Dependent variable: ROA

Table 6. Model 2 regression results.

Coefficients[a]						
Model		Unstandardized regression coefficient		Standardized regression coefficient	t	Sig.
		B	Std. error	Beta		
1	(Constant)	0.208	0.049		4.263	0.000
	CCC	0.000	0.000	-0.239	-2.816	0.005
	CR	-0.010	0.006	-0.203	-1.633	0.104
	DR	-0.268	0.043	-0.753	-6.253	0.000
	SIZE	0.003	0.003	0.063	0.873	0.384

Note: a. Dependent variable: ROA.

5.3.2. Model 2

From Table 5, it shows that the Durbin Watson index is 1.058 (1<d<3), so there is no autocorrelation phenomenon in model 2. The model can explain 26.8% of the variation in ROA (due to the adjusted R-squared index of 0.268), that is, with 4 independent variables, the included control affects 26.8% of the change in the dependent variable, the remaining 73.2% is due to other variables. outside the model and random error.

From Table 6, the VIF values of the variables CCC, CR, DR, SIZE are all less than 10, so multicollinearity does not occur in regression model 2. With a significance level of 5%, corresponding to Sig values. of the variables in the model CCC, CR, DR, SIZE are: 0.005; 0.104 (>0.05); 0.000; 0.384 (>0.05). From there, we eliminate from the regression model the variables with Sig. >5% are: CR, SIZE. We have an unstandardized regression equation rewritten as follows:

$$ROA = 0.208 + 0.000\ CCC - 0.268\ DR$$

Through the equation, it shows that the CCC variable has a positive impact on ROA at the 1% significance level, but with a small impact on profitability. βCCC = 0.000, meaning that under the condition that other variables do not change, when increasing CCC by 1 day, ROA increases by 0.000 (or 0.0%). In addition, the DR variable has a negative impact on ROA, βDR = -0.268, meaning that under the condition that other variables do not change, when DR increases by 1 unit, ROA decreases by 0.268 (or 26.8%). . The impact of DR on ROA is quite large, requiring timely adjustments.

If we consider the standardized regression coefficient (βeta), we have the following standardized regression equation:

$$ROA = -0.239\ CCC - 0.203\ CR - 0.753\ DR + 0.063\ SIZE$$

5.4. Discuss Research Results

The study found a positive relationship between the ACP variable and ROA. Therefore, accept the first hypothesis (Ho1: There is a relationship between ACP and ROA). Analytical data extracted from the software shows that the impact here is insignificant. This means that when increasing the number of receivable days by 1 unit, the profit does not increase much. However, based on this result, we can make the conclusion that: increasing the number of receivable days means increasing the payment term. customers, this policy helps build lasting relationships with partners, increasing revenue means increasing profits. This conclusion is similar to the studies of Safi Ullah Khan and Colleagues (2005) and Mathias B. Baveld (2012).

The second hypothesis (Ho2: There is a relationship between DIH and ROA) is rejected. Because the DIH variable was removed from the regression model (sig.>0.05). This result is similar to the study of Mhd Anas Husaria (2015).

The third hypothesis (Ho3: There is a relationship between DPO and ROA) is rejected for the same reason as the DIH variable in the second hypothesis. This result is similar to the research of Mkhululi Ncube (2011) and Mhd. Anas Husaria (2015).

The study also found a positive relationship between CCC and the ROA variable. Therefore, we accept the fourth hypothesis (Ho4: There is a relationship between CCC and ROA). The impact of CCC on profits is insignificant, similar to the results obtained from hypothesis 1. The increase (decrease) in time from investment in inputs to recovery of money from sales revenue will affect profit increase (decrease) but very little. The results of this study are not similar to any of the studies mentioned by the author.

6. Propose Recommendations

Research results show that the impact of Working Capital management on the profitability of chemical enterprises listed on the Vietnamese stock market is not large. The analyzed data is from a period when the economy is stable and the chemical industry in Vietnam is still in a strong development cycle, so there is no clear impact on working capital management on profitability. However, with the goal of maximizing profits and benefits for the business, changes should still be applied, even if they have a small impact on the overall goal. The authors make some recommendations as follows:

- Increase Average collection days (ACP), to increase business profitability. However, it is necessary to adjust to a reasonable and controllable level. That means, enterprises create conditions for customers to extend payment time but to an acceptable level.
- Increase the number of days of the Cash Conversion Cycle (CCC). Increasing this index has many adjustment options when: CCC = ACP + DIH – DPO. Changing one of the variables in the formula will not only affect the CCC variable but also directly affect the internal margins. It is recommended that when businesses want to influence the CCC variable to increase profitability, they should be careful with the component variables. However, this result may change in the long term, when enterprises must make trade-offs and choose the balance between elements of Working Capital. Therefore, enterprises will need more specific and practical preparation measures.

The above work is only temporary and lacks much basis, so to better prepare for long-term situations. Enterprises need to take the following preparation measures:

- Send management staff to in-depth training and knowledge preparation;
- Set hypothetical situations related to negative changes in working capital management, and find solutions;
- Strictly implementing the terms signed in the sales contract will create good habits for businesses.
- Need to direct the development of methods to calculate the need for Working Capital, on that basis to compare and evaluate the effectiveness of each unit and synthesize the Working Capital needs of the entire enterprise.
- Build an effective information system and regularly analyze and evaluate the efficiency of using working capital of the enterprise. Take into account the implementation of an appropriate business management system - synchronous ERP in the enterprise, thereby providing timely information for the process of regularly evaluating the effectiveness of Working Capital use.

7. Conclusion

The study analyzed and evaluated the impact of Working Capital management on the profitability of chemical enterprises listed on the Vietnamese stock market. The authors have made their recommendations objectively. The contributions of the research will help Working Capital managers in the chemical industry make correct, beneficial decisions that optimize the organization's goals. However, the study cannot avoid shortcomings such as: the number of research samples is small (32 chemical enterprises with a total number of observations of 160). Furthermore, listed chemical enterprises only account for a small portion of the total number of enterprises in the industry, so the research results are still limited and need to expand the research sample to all enterprises in the industry.

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