ESJ Social Sciences Peer-reviewed

The Effect of Average Collection Period, The Inventory Turnover Period, and The Average Inventory Period on Return on Assets

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Doi:10.19044/esj.2024.v20n31p61

Submitted: 25 October 2024
Accepted: 25 November 2024
Published: 30 November 2024

Cite As:
Hamad S. (2024). *The Effect of Average Collection Period, The Inventory Turnover Period, and The Average Inventory Period on Return on Assets*. European Scientific Journal, ESJ, 20 (31), 61. https://doi.org/10.19044/esj.2024.v20n31p61

Abstract

The importance of the Cash Conversion Cycle (CCC) emerges in helping to make appropriate financing decisions for different industries. Therefore, the research focuses on the return on assets (ROA) issues and how it is affected by the three components of the cash conversion cycle; Average Collection Period (ACP), Average Inventory Turnover Period (ITP), and Average Payment Period (APP). Since the topic refers to the potential statistical relationship between the three components and the return on assets, the research has been organized to find the validity of the answer to the research questions and hypothesis on how components affect the return on assets. Statistical analysis reveals a positive relationship between APP and ROA, showing that longer payment periods allow companies to retain cash, thereby increasing asset profitability. Conversely, negative correlations between ACP, ITP, and ROA suggest that shorter collection and turnover periods contribute to higher asset returns by minimizing cash tied up in receivables and inventory and reducing holding costs. The research's findings underline the importance of strategic CCC management, encouraging managers to extend APP when possible while reducing ACP and ITP, to enhance liquidity, maximize asset performance, and prevent financial distress.

Keywords: Cash Conversion Cycle, Average Collection Period, Average Turnover Period, and Average Payment Period, Return on Assets

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Introduction

Working capital stands for dynamic business situations. Therefore, careful control of the working capital becomes important because it has a significant effect on the company's financial health and operating performance (Hingurala et al., 2017). A company's working capital is usually interpreted by using a cash conversion cycle calculated as the average number of collection days plus the average number of inventory days minus the average number of payment days. The average number of collection days plus the average number of inventory days interpreted as cash recovered from sales of finished goods while the average number of payment days is interpreted as the days are needed for payments made to raw material suppliers. From a time and credit purchase perspective, when inventory turnover starts, the average payment period starts because when a company uses credit purchase of raw material, both accounts payable and accounts inventory increase with the same amount at the same time. On the other hand, the average collection period starts with sales being recognized.

The three components of APP, ITP, and ACP represent a dynamic business situation. Therefore, careful control of these three components, and thus the cash conversion cycle, becomes important because they have a significant effect on the company's financial health and operating performance (Hingurala et al., 2017). Companies with a more effective cash conversion cycle have an effective liquidity ratio, require fewer debt and/or equity financing, and generate a better return. According to Ebben and Johnson (2011), utilizing a higher level of receivables and inventory compared to payables increases the need to finance these current assets by debt and/or equity, while lowering the average collection period and average inventory period to the average payable period decreases the need to finance these current assets by debt and/or equity and increase a company's opportunity to finance its operations through payables.

The research aims to explore the impact of the three components of the cash conversion cycle on companies' performance to study the optimal level of three components of the cash conversion cycle that may reduce the cost of inventories and creditors, and receivables to optimize the return on asset. To achieve this aim, the research investigates the statistical relationships between the three components of the cash conversion cycle and return on assets. The research leads to three contributions: distinguishing between the role of each component of the cash conversion cycle and extending the concept of the cash conversion cycle by identifying the significant contribution of three components to the return on asset. Finally, the research highlights the importance of the integration of the three components of the cash conversion cycle.

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Literature Review

The cash conversion cycle is a cycle in which the business purchases and keeps goods in its inventory, sells the inventory on a credit sale and records it in its accounts receivable, and finally, collects cash that closes its receivables. The cash conversion cycle specifies the number of days on which the organization should devote new capital beyond its existing obligations to finance its operational activities. The cash conversion cycle considers the time that is tied up to transforming inventory and receivables into cash as well as the period the company is provided to pay its payables without paying extra fines. Chamaazi (2017) investigated the inverse relationship between the cash conversion cycle and economic value added. Chamaazi (2017) suggested that shortening the cash conversion cycle increases companies' economic value added on the Tehran Stock Exchange. Kouaib and Bu Haya (2024) explored how cash conversion cycle components affect companies' performance on the Saudi Stock Exchange from 2018-2022. Their Findings highlight that a shorter cash conversion cycle correlates with improved companies' performance which indicates that efficient liquidity management enhances financial health and value. Alvarez et al. (2021) examined the impact of working capital components on profitability in emerging economies. They showed how components of cash conversion cycles significantly affect financial performance and stability. Ceylan (2021) examined cash conversion cycle impacts on the profitability of small and medium-sized companies were listed on the Istanbul Stock Exchange. The study showed that a shorter cash conversion cycle correlated positively with profitability.

Conversely, the level of a company's assets is mostly managed and operated by individuals holding a non-financial position and thus they may not be able to connect their decision to liquidity and profitability (Bolek et al., 2012). For instance, from a management perspective, the inventory is managed by the supply chain department, receivables are determined by sales negotiations and the sales department, while the payable and billing payment cycle is determined because of the engagement and agreement with suppliers with various potentials of discounts conditions and early payment invoices. If the average collection period and average inventory period get longer and the average payable period gets shorter, the more money a company would utilize to finance its operations which may contribute to a decrease in the investment viability and profitability, and the company may not be able to have low-interest incentives (Bolek et al., 2012). Delaying payment to creditors may increase companies' opportunity to access higher quality raw materials and more versatile means of financing (Gull and Arshad, 2013). On the other hand, too much delay in paying creditors' obligations will negatively affect profits and reduce the company's credit scores in the business environment.

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However, the absence of inventory control may require extra financing in this scenario. This financing may arise from existing obligations and short-term debts (Bolek et al., 2012). Lower credit scores restrict access to favorable financing options, thereby increasing the cost of borrowing. Furthermore, strained relationships with creditors may lead to stricter payment terms, disruptions in supply chains, and damage to the company's market position. Without proper inventory management, companies risk overstocking, leading to increased holding costs, or understocking, which can disrupt operations and revenue generation and increase financial risk due to additional financing that may be required to sustain the inflated inventory levels. Empirical studies have highlighted the interconnectedness of inventory control, credit management, and corporate profitability. For instance, Ganesan (2007) emphasized the importance of balancing receivables and payables to maintain financial stability, noting that excessive delays in creditor payments can strain liquidity and profitability. Companies that fail to leverage favorable credit terms or early settlement discounts may find themselves at a competitive disadvantage (Gill et al., 2010). Additionally, inefficient management can lead to liquidity constraints, forcing companies to resort to expensive short-term financing options, thereby reducing return on assets (ROA) and shareholder value (Sharma & Kumar, 2011). Conversely, companies with efficient working capital cycles tend to have higher profitability and lower financing costs (Lazaridis and Tryfonidis, 2006).

Return on Assets (ROA)

Profitability is known as the purpose of business activities. Profitability is seen as a measure of organizational performance because it measures the efficiency of its manufacturing efforts, facilities, equipment, and current assets that are turned into profit (Mohamad and Saad, 2010). Reducing the average collection period may decrease a company's profitability as the company may lose its solid credit customers resulting in lower sales, lower revenue, and thus lower profit (Bolek and Grosicki, 2015). To improve the profitability of the business, the cash conversion cycle should be shortened either by reducing the average collection period or the average inventory period or by extending the average payment period. The research relies on the data obtained periodically for 90 days. Since the research preserves the stability of the data collected over time, the ROA is determined as follows,

$$\text{Return on Assets (ROA)} = \frac{Net\ Income}{Total\ Assets}$$

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Average Collection Period (ACP)

The average collection period is the average time that is needed to collect cash from credit sales. The average collection period involves accounts receivable ages, setting a credit sales policy, and the collection process (Kumaraswamy, 2016). According to Kumaraswamy (2016), a short average collection period reduces investment in accounts receivable but may lower sales and thus profit. Conversely, a longer average collection period increases sales and thus profit but increases accounts receivable investment. Lazaridis and Tryfonidis (2006) noted that more credit sales create a longer collection period and thus capital structure combination. Companies with good receivable financing capability during sales fluctuation may experience low free cash flow that may increase debt levels (Hill et al., 2010). Therefore, credit sales, sometimes, are considered insufficient operating performance. Theoretically, the average collecting period may declaim to zero. According to Lucic (2014), this presents a leading situation. The research relies on the data obtained periodically for 90 days. Since the research preserves the stability of the data collected over time, the ACP is determined as follows,

$$\text{Average Collection Period (ACP)} = \frac{Average\ of\ Accounts\ Receivable}{Sales} * 90$$

H_{01}: there is a negative association between the average collection period and the return on assets.

Inventory Turnover Period (ITP)

Inventory can be interpreted as the level that shall be determined by the production department under engineering decisions (Bolek et al., 2012). There are three types of inventories; raw materials, work in process, and finished goods. The average inventory period is the average time needed to use raw materials the time needed to be converted into finished goods plus the time needed to be sold (Kumaraswamy, 2016). In other words, the raw material inventory level is controlled by the procurement department, while work in process and finished goods inventories are controlled by the production department (Bolek et al., 2012). On the other hand, the sales volume is the product of an agreement with buyers. If the inventory and sales volumes are not synchronized, it can generate liquidity issues. Thus, inventory is considered one of the most important components of the cash conversion cycle because of the significant investments involved.

Companies endeavor an optimal inventory level to increase profitability and reduce potential asset loss. Therefore, the shorter the average inventory period, the higher the return on assets which results in reducing potential obsolescence and price privilege, and reducing short-term financing

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demands (Kumaraswamy, 2016). A long average inventory period can be shown as a company has high liquidity to manufacture more goods without sales. Therefore, inventories are needed to support the company's sales. The research relies on the data obtained periodically for 90 days. Since the research preserves the stability of the data collected over time, the ITP is determined as follows,

$$\text{Inventory turnover period (ITP)} = \frac{Average\ of\ Accounts\ Inventory}{COGS} * 90$$

H_{02}: there is a negative association between the average inventory turnover period and the return on assets.

Average Inventory Period (AIP)

The average payment period is the time that is needed by a company to pay its credit suppliers. To reduce the need for instant financing or cash and enhance liquidity, companies prolong the payment period. According to Hill et al. (2010), companies try to delay their payables to increase their ability to finance their sales fluctuation. The short average payment period stands for the average time between a credit purchase and paying for it. Therefore, if a company experiences low cash or liquidity, the average payment period may increase. Bauer (2004) noted that profitability and short-term debt are positively related. The research relies on the data obtained periodically for 90 days. Since the research preserves the stability of the data collected over time, the APP is determined as follows,

$$\text{Average Payment Period (APP)} = \frac{Average\ of\ Accounts\ Payable}{COGS} * 90$$

H_{03}: there is a positive association between the average payment period and the return on assets.

Methodology

Data Collection

The datasets have been downloaded from the U.S. Security and Exchange Commission (SEC) website which mandates the use of eXtensible Business Reporting Language (XBRL) for all registered companies. This standardized format ensures uniformity and accessibility across financial statements, enhancing data consistency for comparative and analytical purposes. This uniformity facilitates consistent analysis across companies and industries, minimizing biases arising from differing regulatory practices. In addition, the uniformity provided by SEC data ensures consistent analysis because companies listed in the U.S. follow the Generally Accepted

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Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS) where applicable, with detailed and structured disclosures. This standardization minimizes potential biases stemming from differences in accounting practices, regulatory frameworks, or reporting formats that could arise in other regions. Moreover, the U.S. market is characterized by its maturity, depth, and transparency, supported by rigorous disclosure rules under the Sarbanes-Oxley Act of 2002. These rules mandate a high level of financial and operational transparency, which facilitates the robust analysis of statistical relationships.

In contrast, while markets in Asia or Europe also provide valuable data, these regions have significant variations in regulatory oversight, reporting frameworks, and market maturity. For example, many Asian countries operate under diverse national accounting standards, while the European Union uses IFRS but still allows for certain local adaptations. These differences can introduce noise into comparative analyses and reduce the reliability of conclusions drawn. Moreover, the U.S. SEC database offers extensive, centralized, and publicly accessible data, making it a uniquely efficient and reliable source for academic and industry research.

Quarterly financial data was collected for the period 2015 to 2017, specifically focusing on seven publicly traded companies. The selection criteria for these companies centered on the construction industry, data availability, and comparability. Choosing companies within similar industries ensures that the financial metrics and cash conversion cycle elements would be comparable across entities. Each company had to have a complete dataset of financials reported consistently over the selected period to allow for dependable statistical analysis. The methodological choices, including the use of quarterly data, were made to capture intra-year financial dynamics, providing more granularity than annual data could offer. This approach enhances the accuracy of our findings and the impact of the three components of the cash conversion cycle on Return on Assets (ROA).

In terms of previously used equations, Table-1 shows the equations that were used by some earlier researchers who investigated the effect of the cash conversion cycle on profitability. These researchers used Return on Assets (ROA) or Return on Equity (ROE) in their models.

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Table 1. Authors versus Regression

	Author	Regression
1	Anser and Malik (2013)	ROA = α + β1 Size + β2 Debt +β3 CCC + ε ROE = α + β1 Size + β2 Debt + β3 CCC + ε
2	Murugesu, (2013) who used regression that been used by Uyar (2009)	ROE = α + β ccc + ε ROA = α + β ccc + ε NP = α + β ccc + ε
3	Deloof (2003)	Ln (sales) = Sales Growth + Financial Debt + Fixed Financial Assets + Variability + No. of Days Accounts Receivables + No. of Days Inventories + No. of Days Accounts Payables + Cash Conversion Cycle

Statistical Model

The research uses the multivariate regression method to investigate the relationship between the three components of the cash conversion cycle and the return of assets because it allows for the simultaneous consideration of multiple independent variables and their combined effect on a dependent variable (ROA). In addition, the components of the CCC are often correlated with one another. Multivariate regression helps capture the combined impact of these correlated factors on ROA, ensuring that the effects are properly attributed to each variable rather than inflating or diminishing the influence due to multicollinearity. Furthermore, multivariate regression enables the quantification of the individual and collective effect of each component of the cash conversion cycle, giving a better understanding of which component has the most influence.

Multivariate linear regression is a linear approach that models the association between a dependent variable and more than one independent variable. This concept predicts multiple associated dependent variables by using the linear equation function. The uncertain equation parameters are calculated from the dataset. The advantage of linear regression is the capability to evaluate the proportional effect of the independent variables on a significant level. The other advantage is the potential to detect outliers or deviations. On the other hand, any defect in using the multiple regression is typically due to the data that was used. The research only uses the Average Collection Period, Average payment Period, and Average Inventory period as independent variables. Thus, no other financial ratio will be used to avoid intercorrelation factors with other ratios that may affect the significant statistical level with the profitability ratio, ROA. In addition, by only using the three components, the research will use the regression that has been used by Murugesu, (2013) after extracting the CCC variable into its three components to more understand the effects of these components on companies' profitability. The proposed regression will be as follows,

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$$ROA = \beta_0 + \beta_1 ACP + \beta_2 ITP + \beta_3 APP + \varepsilon$$

Where:
$\beta_0, \beta_1, \beta_2, and\ \beta_3$: are unknown parameters that will be determined.
ε: the random error of observations
And,

Table 2. Variables

	Initial	Variable	Calculation	Used by
1	ROA	Return on Assets	Net Income / Total Assets	Murugesu, (2013) who used regression that been used by Uyar (2009)
2	ACP	Average Collection Period	(Average Accounts Receivables / Sales) * 90	Deloof (2003)
3	ITP	Average Inventory Period	(Average Accounts Inventory / Cost of Goods Sold) * 90	Deloof (2003)
4	APP	Average Accounts Payable	(Average Accounts payables / Cost of Goods Sold) * 90	Deloof (2003)

Descriptive Statistics

Table-3 shows the statistical figures of the variables used in the research. As seen in table-3 and Figures 1-4, the ROA data is not skewed. While the ACP, ITP, and APP are right-skewed because most of the data are found on the right side. In other words, most of the average days of each independent variable are relatively small. Companies keep low and reasonable levels of the average collection period and inventory period levels and take advantage of increasing the average payment period to provide adequate financing resources for their investments.

Table 3. Descriptive Statistics

		ACP	APP	ITP	ROA
1	Min.	0.3361	1.353	0.1561	0.006952
2	1st Qu.	1.3275	5.568	5.5831	0.027655
3	Median	3.8528	7.939	45.2169	0.042603
4	Mean	8.3127	8.391	81.1539	0.042498
5	3rd Qu.	14.6699	11.043	149.9614	0.057526
6	Max.	28.3375	18.209	243.2271	0.079022

Table 3 provides a summary of the descriptive statistics for ACP, APP, ITP, and ROA variables. The ACP ranges from a minimum of 0.3361 to a maximum of 28.3375, with a mean of 8.3127 and a median of 3.8528. This wide range indicates variability in how efficiently companies collect receivables while the mean indicates that, on average, companies take approximately 8 days to collect receivables, though the skewness toward higher suggests the presence of companies with particularly long collection periods. In addition, the lower quartile value (1.3275) suggests that a significant portion of companies manage to collect payments relatively

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quickly, while the higher quartile value (14.6699) highlights challenges faced by some firms in receivables management.

The APP has a minimum value of 1.353 and a maximum of 18.209, with a mean of 8.391 and a median of 7.939. The proximity of the mean and median suggests a relatively symmetric distribution of payment periods. This suggests that companies, on average, take a similar duration to settle their payables as they do to collect receivables. Companies in the first quartile (5.568) settle payables faster, benefiting from early payment discounts or better supplier terms, while those in the upper quartile (11.043) take longer, which may indicate liquidity constraints or strategic use of trade credit.

ITP shows the most significant variation, with a minimum of 0.1561 and a maximum of 243.2271. The mean (81.1539) far exceeds the median (45.2169), indicating a right-skewed distribution where some companies have exceptionally high inventory turnover periods. This variation might stem from differences in project timelines, inventory management practices, and the nature of materials used in construction projects. Companies in the lower quartile (5.5831) demonstrate efficient inventory management, while those in the upper quartile (149.9614) might face inefficiencies or project-specific inventory accumulation.

ROA values range from 0.006952 to 0.079022, with a mean of 0.042498 and a median of 0.042603. The close alignment of the mean and median suggests a balanced distribution of profitability. Companies in the lower quartile (0.027655) may struggle with asset utilization or profitability, while those in the upper quartile (0.057526) exhibit better financial performance. This metric underscores the importance of operational efficiency and its impact on profitability.

In conclusion, table 3 reveals significant variability in operational and financial performance metrics within the construction industry. This variability may be influenced by factors such as company size, project complexity, and market conditions. High ITP values highlight potential inefficiencies in inventory management, while the broad range in ACP and APP reflects diverse working capital strategies. ROA's narrow range underscores its utility as a standardized measure of profitability across companies. Finally, the skewed distributions in ACP and ITP emphasize the importance of improving receivables and inventory management to enhance overall performance and profitability.

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Figure 1. Return on Assets (ROA)

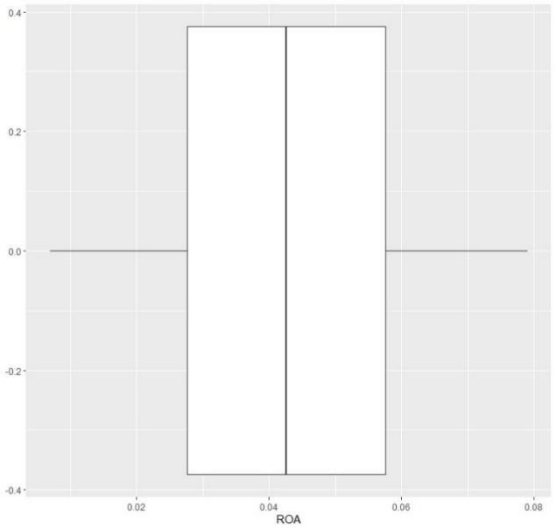


Figure 2. Average Collection Period (ACP)

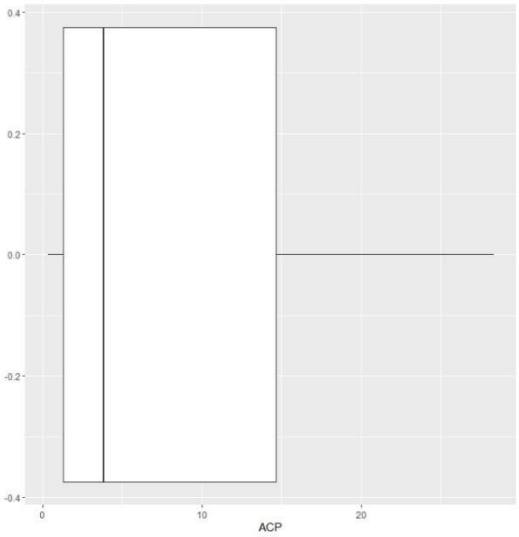


Figure 3. Average Inventory Turnover Period (ITP)

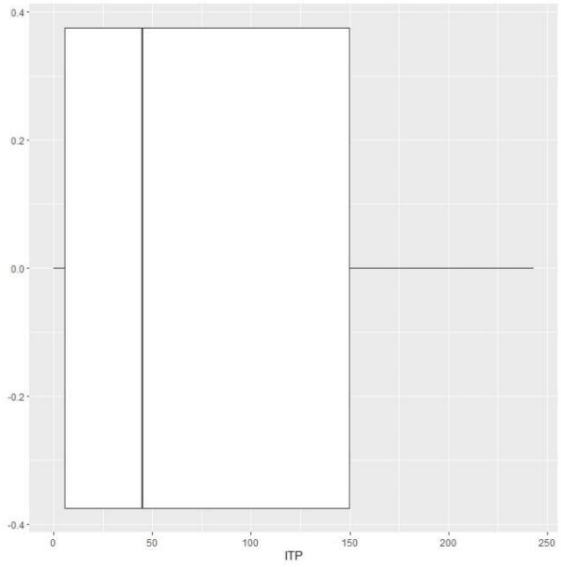
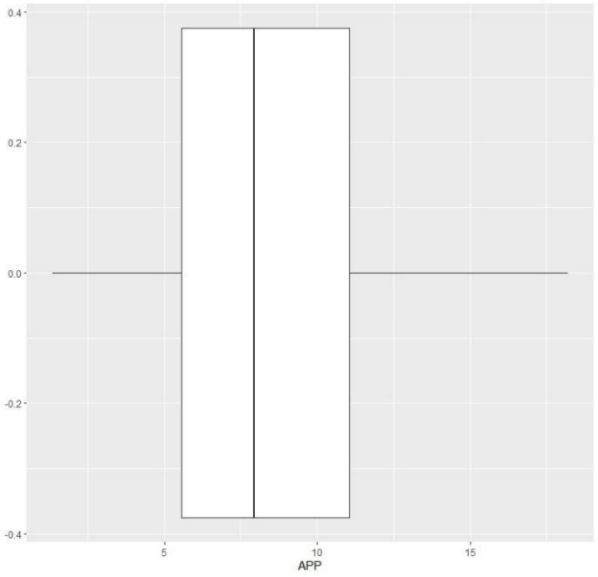


Figure 4. Average Payment Period (APP)



The boxplot of ROA, Figure 1, shows narrow range between the lower and upper quartiles and thus low variability in ROA across the dataset. The median is positioned near the center of the interquartile range, reflecting a symmetric distribution of ROA values. On the other hand, the boxplot of the ACP, Figure 2, shows a wider interquartile range which indicates higher variability in ACP. The presence of an elongated range (whiskers) suggests some dispersion of values. The narrowness of the box itself points to a concentration of ACP values near the median.

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The boxplot for ITP, Figure 3, suggests a highly skewed distribution with a median close to the lower quartile. The larger range of data above the IQR indicates the presence of extreme values in the upper end of the dataset. The APP boxplot, Figure 4, exhibits a more concentrated distribution. The narrower IQR and absence of extreme deviations suggest a more consistent behavior in average payables among companies in the dataset. The median, located closer to the center of the IQR, reflects a symmetric distribution of data for APP.

Regression Model

From table-4, the ACP is significantly statistically negative with ROA, and thus the null hypothesis H01 cannot be rejected at a significant level of 0.001. The ITP is significantly statistically negative with ROA and thus the null hypothesis H02 cannot be rejected at a significant level of 0.001. The APP is significantly statistically positive with ROA and thus the null hypothesis H03 can't be rejected at a significant level of 0.1. In addition, Figure 5 shows the regression analysis. The graph shows that values among ACP, ITP, and APP suggest a balanced performance across the metrics, because the near-zero values imply either marginal changes over time or that these variables are close to an equilibrium.

Table 4. Regression model results

Variables	Coefficients	Std. Error	t value	p-value
Intercept	7.589e-02	2.242e-03	33.857	2e-16 ***
ACP	-1.845e-03	1.407e-04	-13.114	2e-16 ***
ITP	-2.743e-04	1.256e-05	-21.840	2e-16 ***
APP	5.010e-04	2.392e-04	2.094	0.0394 *
No. of Observations	84			
R-Squared	0.8578			
Adjusted-R^2	0.8524			
F-statistic	160.8, p-value = 2.2e-16			
Durbin-Watson	DW = 1.8224, p-value = 0.1547			

Notes: The dependent variable includes *Return on Assets (ROA)* equals to the Net Income divided by the Total Assets.
The independent variables include *the Average Collection Period (ACP)*, which is equal to the Average Accounts Receivables divided by Sales. *The Average Payment Period (APP)* equals the Average Accounts Payables divided by the Costs of Goods Sold. *The Average Inventory Turnover Period (ITP)* equals the Average of Accounts Inventory divided by Costs of Goods Sold.

T-statistics are in parentheses beneath coefficient estimates.

All results are presented with a consistent significance level of 0.1 for comparability. Additional significance notation indicates stronger significance levels: ***p < 0.001, **p < 0.05, *p < 0.1

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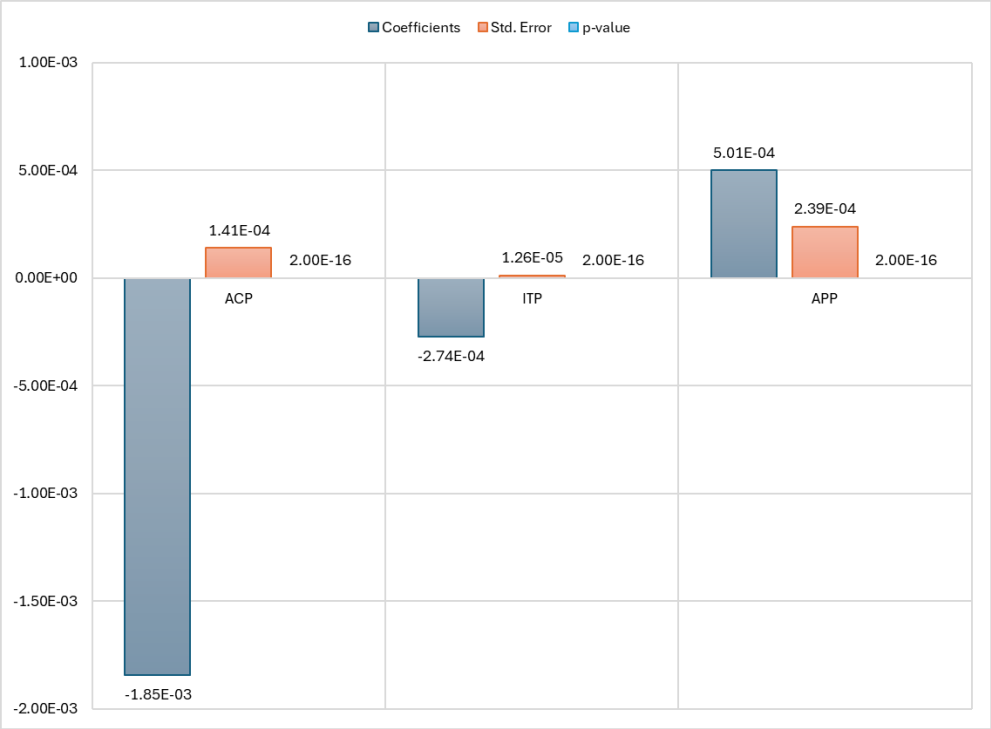

Figure 5: Bar Chart shows the results of regression analysis

Evaluation of Linear Regression Assumptions

The linear regression assumes that the linear relationship between the independent variable and dependent variables, homoscedasticity, independence (no autocorrelation), and the dependent variable and independent variables are normally distributed for any fixed value. Linearity assumes that the mean of the residuals equals zero. The meaning of the residuals is equal to 5.286393e-20 which is close to zero. In addition, to check the homoscedasticity, the research uses the studentized Breusch-Pagan test. The test result was BP = 3.9922, df = 3, p-value = 0.2623. Therefore, the null hypotheses cannot be rejected and there is a constant variance of residual for any value of dependent variables. Furthermore, to check the independence, the research uses the ACF plot. From figure-6, the horizontal axis stands for the lags of the residuals that increase by one step as an interval. The first vertical line always equals one because it stands for the correlation of residual with itself. The next vertical lines are within the two dashed lines that stand for the upper and lower significant levels. This means that the residuals were not autocorrelated. In addition, the research uses Pearson's correlation matrix to assess any intercedence between the independent variables that may exceed 0.7, as shown in table-5 and figure-7. Finally, to check the normality assumption, the research uses the Shapiro-Wilk normality test. The test result

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was W = 0.9723, p-value = 0.06687. Therefore, the null hypotheses cannot be rejected and thus the data is normally distributed.

Table 5. Pearson's Correlation Matrix

		ACP	APP	ITP
1	AC P	1	0.594001589	-0.658071279
2	AP P	0.594001589	1	-0.26955209
3	ITP	-0.658071279	-0.26955209	1

Figure 6: ACF Graph

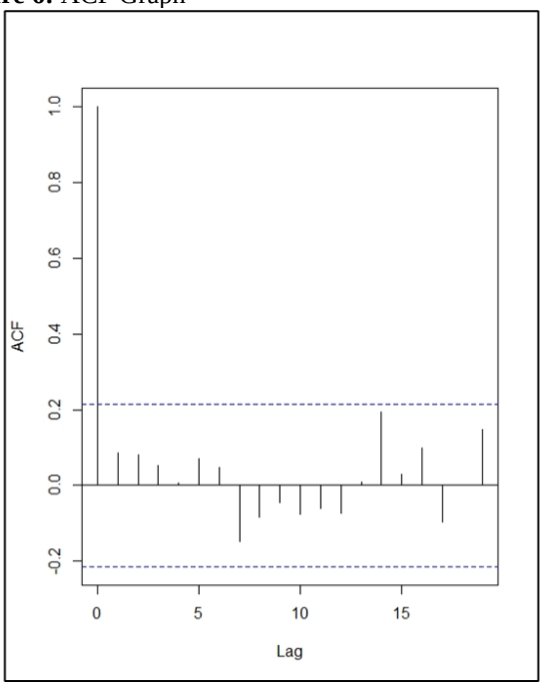
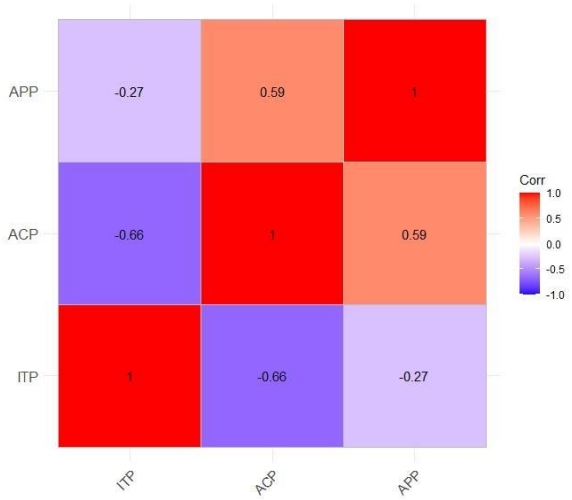


Figure 7: Pearson's Correlation Graph



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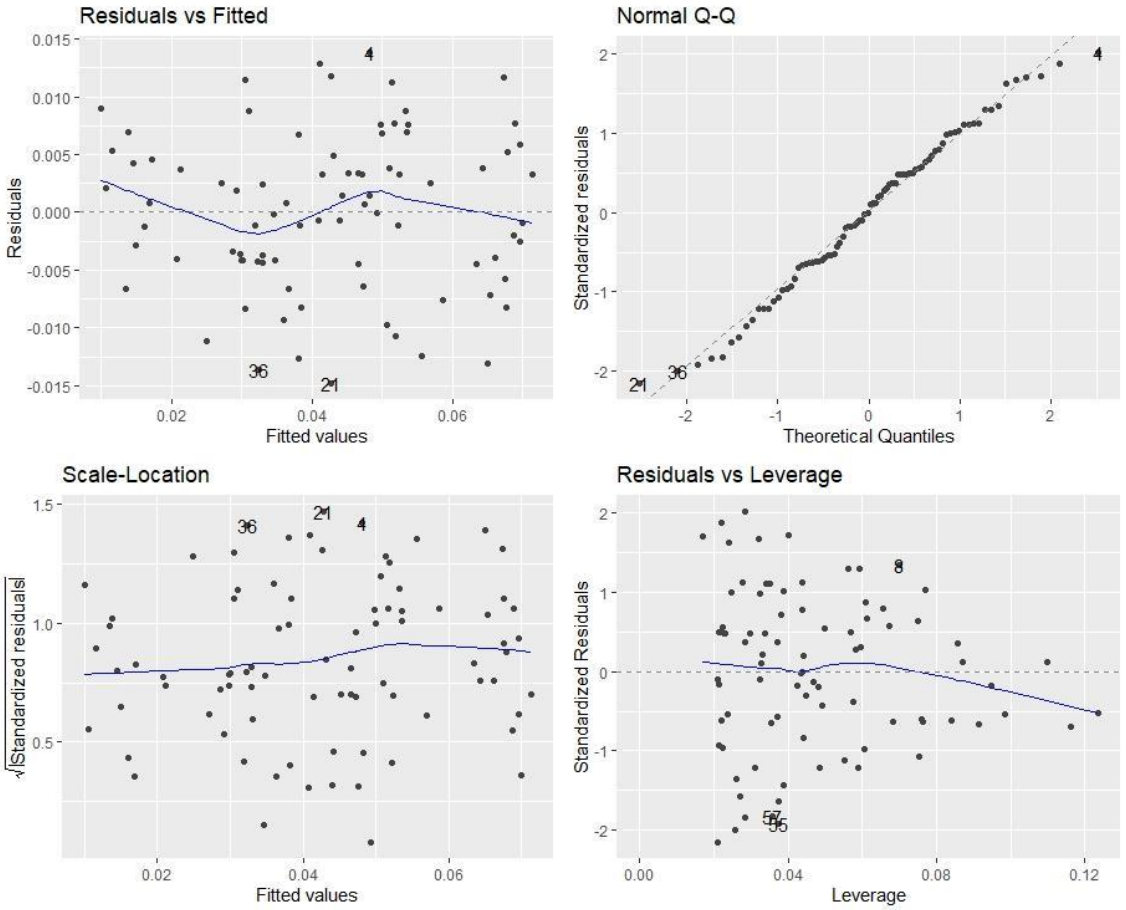

Figure 8. Multilinear Regression Tests Graphs

In addition, figure represents four diagnostic plots for evaluating model assumption. The diagnostic plots indicate that the results are acceptable for proceeding with statistical analysis. The Residuals vs Fitted plot shows only minor curvature, suggesting that the linearity assumption is not severely violated. While slight non-linearity is present, the deviations are not substantial enough to warrant rejecting the model. The relationship captured by the regression appears sufficiently linear for the purposes of further analysis. The Normal Q-Q plot demonstrates that the residuals follow a normal distribution, with only minor deviations at the extremes. This level of non-normality is typical in empirical data, particularly in the construction industry, and is unlikely to meaningfully impact the validity of hypothesis testing or confidence intervals, given the robustness of statistical methods to small departures from normality.

The Scale-Location plot indicates that the variance of residuals is constant across fitted values, with only minor heteroscedasticity. In applied

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settings, particularly in financial and business data, slight heteroscedasticity is common and does not necessarily invalidate the results. Weighted least squares or robust standard errors can mitigate any potential effects if needed. The Residuals vs Leverage plot highlights a few observations with higher influence. However, these points do not display excessive leverage or residual values that would suggest they are highly problematic. Their impact can be further evaluated, but they do not appear to compromise the overall integrity of the model. Considering these factors, the assumptions underlying regression analysis are sufficiently met, and the model is robust enough to proceed. Minor deviations are expected in real-world data, and the results remain valid for interpretation and further statistical analysis.

Empirical review

The findings reveal several key insights into the statistical and practical significance of the variables under investigation. The negative coefficient for ACP (-1.845e-03, $p < 0.001$) indicates that a shorter collection period increases ROA, enhances liquidity, and reduces financing costs. This finding supports existing literature emphasizing the importance of minimizing receivables to enhance profitability (Deloof, 2003; Raheman and Nasr, 2007). In addition, Lazaridis and Tryfonidis (2006) highlighted that firms maintaining a shorter ACP can allocate resources more efficiently to generate returns. As a result, companies should aim to reduce ACP to free up cash flow and reduce opportunity costs associated with delayed payments. Similarly, the negative coefficient for ITP (-2.743e-04, $p < 0.001$) indicates that reducing inventory turnover time enhances performance due to decreasing holding costs or obsolescence risk. This finding is consistent with studies like Deloof (2003), which demonstrated that lower inventory levels decrease holding costs and thus enhance profitability. Also, the findings are consistent with Lazaridis and Tryfonidis (2006) and Gill et al. (2010) which advocated efficient inventory management to minimize costs and improve performance.

In contrast, the positive coefficient for APP (5.010e-04, $p = 0.0394$) suggests that extending payment periods improves ROA. Sharma and Kumar (2011) noted that delayed payments allow companies to leverage trade credit as a low-cost financing source. However, excessively long APP may harm supplier relationships or incur penalties which indicates that companies should balance trade credit to avoid diminishing returns. Finally, the model's R-squared value (0.8578) demonstrates a strong explanatory power, with the independent variables accounting for approximately 86% of the variation in ROA. The F-statistic (160.8, $p < 0.001$) confirms the overall significance of the model, supporting the validity of the findings. Additionally, the Durbin-Watson statistic (1.8224, $p = 0.1547$) indicates no significant autocorrelation in the residuals, ensuring the robustness of the regression results.

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Conclusion

The results are consistent with Bolek et al. (2012) and García-Teruel and Martínez-Solano (2007). García-Teruel and Martínez-Solano (2007) noted that the shorter the cash conversion cycle, the more profitable for the companies. The longer the cash conversion cycle, the more use in current assets, thus the higher the requirement for financing the current asset. In addition, the results are consistent with Deloof (2003). The results show that managers can add value by reducing the days of both the average collection period and the average inventory turnover period. In addition, according to Nobanee et al. (2011), the shorter the cash conversion cycle, the more efficient it is to use a company's working capital as well as daily operations. The research found that a more average payment period leads to more return on assets. Therefore, the results propose that managers can produce value for their owners by minimizing the average collection period and inventories to a fare minimum figure. The findings show that attention should be paid to the value of managing the components of the cash conversion cycle to avoid periods of potential financial distress.

The results show that profitable companies have shorter days of average collection period and average inventory period as well as longer average payment period. The results prove the importance of balancing the needs for three components of the cash conversion cycle to achieve an increase in a company's performance. Furthermore, companies could integrate these components into their operational targets to streamline cash flows, minimize holding costs, and leverage supplier credit terms effectively. These practices could also aid in mitigating potential financial risks, particularly in industries with high inventory turnover or extended receivables cycles. Additionally, these three components could be part of the strategic and financial planning of the company to function effectively, consistently, and successfully. The findings could be used to establish guidelines that encourage efficient working capital management practices among construction firms. For instance, policies could promote transparency in credit terms, encourage fair payment practices across the supply chain, and provide incentives for adopting advanced cash flow management systems. Additionally, companies might consider offering training programs and resources to help optimize their cash conversion cycles and enhance profitability. Such policies could strengthen the financial stability of the construction sector, support companies' growth, and mitigate risks associated with financial distress in the industry.

On the other hand, this research focuses exclusively on the construction industry, which has its unique cash conversion patterns and inventory management challenges compared to other sectors. As a result, the findings may not be fully generalizable to industries with different cash conversion cycles, such as manufacturing or retail. Additionally, external

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

economic factors, such as fluctuations in material costs, labor availability, and project financing conditions, could further influence the relationship between cash conversion cycle components and profitability in construction. Future research could compare these findings across various industries and consider incorporating economic factors specific to construction, such as regulatory impacts or supply chain constraints, to improve the robustness of the conclusions. Therefore, for future research, examining industry-specific variations in the cash conversion cycle's impact on profitability could provide deeper insights while investigating external factors such as macroeconomic conditions, supply chain disruptions, or credit terms that might reveal moderating effects on these relationships. Analyzing longitudinal data could further clarify how changes in the cash conversion cycle affect long-term performance across economic cycles.

Conflict of Interest: The author reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

Funding Statement: The author did not obtain any funding for this research.

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