



## The Impact of Working Capital, Leverage and Liquidity on Profitability: Evidence from Manufacturing Firms in Pakistan

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### ABSTRACT

The research aimed to assess the impact of working capital turnover, liquidity, and leverage on the profitability of the firms. This study used secondary data from the financial statements of 25 manufacturing firms listed on the Pakistan Stock Exchange (PSX) 100 index. The data period consists of 2014 to 2024, and the total number of samples obtained was 275. This study employed causal associative research. Therefore, constructed the panel data technique approach. The regression analytical approach is utilized for hypothesis testing. The Shapiro-Wilk test results demonstrate that all variable distributions are normal. Regression analysis findings show that working capital turnover shows no significant impact on the profitability of the firms. Whereas leverage shows a negative impact on profitability, and liquidity shows a positive significant impact on the profitability of the firms.



## Introduction

To succeed in today's competitive market, companies must be able to consistently compete. To be competitive in domestic and international markets, organizations must prioritize their operational and financial activities. For a business to be profitable, working capital management must be performed well. Effective working capital management is crucial for manufacturing organizations, as current assets such as inventories and trade receivables account for a significant portion of their assets. Profitability may be defined as the rate of return on investment. Overinvestment in current assets can have a detrimental impact on investment returns.

Inrawan et al. (2025) studied the impact of liquidity on profitability, but did not consider capital structure or business size as independent factors. This highlights the need to investigate how liquidity might improve or decrease the link between leverage, company size, and profitability, particularly in the property and real estate sectors. Companies measure their financial performance using basic ratios derived from their financial filings. Kasmir and Revisi (2013) stated that profitability ratios indicate a company's ability to manage assets and are calculated from financial statements. These ratios offer worth to specific features of the financial statements. Profitability refers to a company's increase in sales, assets, and earnings relative to its own capital Satriya and Lestari (2014).

Management is accountable for increasing sales and earnings, financing firm activities, increasing assets, and meeting obligations. Managers' performance is measured by their capacity to generate profits. A manager's primary responsibility is to maximize profits. Managers strive to improve the company's profitability through ongoing innovation. To optimize profits, a company's financial management should understand the key aspects that drive profitability. This allows them to take proactive efforts to address issues and avoid negative repercussions Nugroho et al. (2011). A company's profitability is influenced by several things. Effective asset, cost, and debt management are essential for maximizing these elements. The creditor's faith in the company's assets serves as a guarantee for the cash invested in it. Return on assets (ROA) is a technique for measuring a company's profitability. This ratio is a highly significant among present profitability measures. Top management commonly uses the ROA ratio to evaluate business divisions in multi-divisional corporations. Financial statements provide insight into a company's profitability within its industry Sani and Dinuka (2023).

Leverage is the amount of financial debt that businesses utilize to boost profits. Higher debt levels lead to more leverage and danger for corporations. Companies with a lower debt-to-asset ratio have less leverage, which reduces the danger of bankruptcy and the likelihood that they would cease operations Vuković and Jakšić (2019). Profit is a good indicator of the company's performance. Return on Assets (ROA) is an indication of a company's efficiency in creating profits from each unit of shareholder equity. It explains how much investment is used to generate profits.

### **Importance of the Study**

This study follows a systematic approach to analyze how working capital, leverage, and liquidity impact the profitability of manufacturing firms in Pakistan. Therefore, a panel data technique has been constructed to check its practical implications, especially for the Pakistan context. We developed a data model and tools to assess the effect of procedures for managing capital on profitability.

### **Literature Review**

#### **Agency Theory**

Jensen and Meckling (1976) presented a theory of a company based on conflicts of interest among investors, management of the company, and debtors has led to extensive research on how to resolve these conflicts. According to agency theory, corporations are formed by agreements among commercial owners of resources (the owners') and executives (agents) who manage resource usage and control. Agency theory emerged as a result of the separation of ownership and management in

huge modern corporations, rendering conventional corporate theory obsolete for analyzing these businesses.

### **Working Capital Turnover**

Working capital is important for a company's efficient operations and continuous success. Working capital refers to a business's investment in short-term resources, including cash, securities, trade receivables, and inventory. Net working capital equals current assets minus current debt, which includes bank loans, promissory notes, trade obligations, wages, and tax bills. Bintara et al. (2020) stated when a company is in business, its working capital is active. The working capital turnover period begins with the investment of funds in working capital components and ends with the return of cash. Shorter periods lead to faster or greater turnover rates.

Following is the formula for determining the current ratio:

$$\text{Working Capital Turnover} = \frac{\text{Sales}}{\text{Current Assets} - \text{Current Liabilities}}$$

### **Liquidity**

Ishak and Isa (2025) examined the liquidity ratio evaluates a business's ability to meet short-term obligations on time. The liquidity ratio is also known as short-term liquidity. Existing debt is a financial obligation due within one year or during a regular business process. Cash sources for meeting commitments can be derived from current assets. Researchers use the current ratio to assess liquidity. Investors will receive lower returns if a company's potential to generate profits is decreased.

Following is the formula for determining the Liquidity ratio:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

### **Leverage**

Miller (1991) highlighted a company's leverage ratio indicates its level of debt financing. Excessive debt can cause extreme leverage, making it hard to discharge the financial strain and putting the organization at risk. The corporation must weigh the benefits of taking on debt and the sources of repayment. To assess researchers' leverage, use the Debt to Equity Ratio (DER). The Debt to equity ratio links debt and equity in business finance, indicating a company's capacity to fulfill its own commitments.

Following is the formula for determining the Leverage ratio:

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Total Shareholder's equity}}$$

### **Profitability**

The company's primary goal is to maximize profits. Profitability is crucial to the company's long-term success. Companies must maintain profitability for long-term success. Profitability is an

essential metric of the company's managerial effectiveness, since it measures the advantages achieved. Researchers estimate profitability using return on assets (ROA). ROA is an indicator of a company's profit. ROA calculates the net profit from a company's activities based on its total wealth. Effective asset management by management is a key factor in determining a company's ROA, which reflects operational efficiency. A higher ROA indicates more efficient operations, whereas a lower ROA may indicate unemployed assets, surplus inventories, excess paper money, underperforming fixed assets, or other stock exchange issues.

Following is the formula for determining the Profitability ratio:

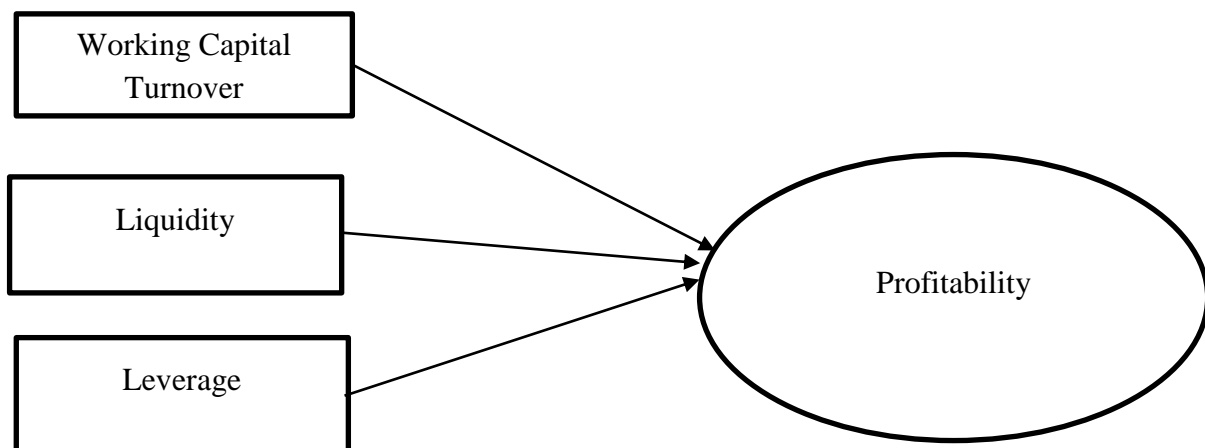
$$ROA = \frac{\text{Earning After Tax}}{\text{Total Assets}}$$

### **Hypothesis Testing**

The research hypotheses suggested are as follows:

- H1: Working Capital Turnover Impact profitability.
- H2: Liquidity Impact Profitability.
- H3: Leverage Impact Profitability.

### **Conceptual Framework:**



**Figure 1: Conceptual Framework**

### **Source of Data Collection**

This research utilizes secondary data from annual financial reports provided on the Pakistan Stock Exchange (PSX). This study uses secondary data from financial statements of 25 manufacturing firms listed on the Pakistan Stock Exchange (PSX) 100 index from 2014 to 2024.

### **Methodology**

The study uses secondary data from financial statements of 25 manufacturing firms listed on the Pakistan Stock Exchange (PSX) 100 index from 2014 to 2024. The total number of samples obtained was 275, which was calculated by multiplying 25 companies by 11 number of years. This data was subsequently utilized in this study. The data normality test, multicollinearity test, Descriptive statistics and Regression model tests were performed.

**Results and Discussion**

This segment summarizes the data normality test, multicollinearity tests, descriptive statistics, and OLS regression model analysis.

**Regression Equation:**

$$Y(\text{Profitability}) = \beta_0 + X1_{(\text{Working Capital Turnover})} + X2_{(\text{Liquidity})} + X3_{(\text{Leverage})} + \epsilon_t \dots \dots (1)$$

Whereas:

$\beta_0$  = Coefficient of intercept (Constant)

Y = Profitability

X1 = Working Capital Turnover

X2 = Liquidity

X3 = Leverage

$\epsilon_t$  = Error term

**Table 1: Summary of Data Normality test**

Variables	W-statistic	P-value	N
Y	0.907213	0.5674	275
X1	0.959811	0.7507	275
X2	0.783638	0.8632	275
X3	0.896752	0.6732	275

**Source:** Authors' own calculation

\*\*Level of Significance: 5%

This table appears to present results from a statistical analysis, possibly a normality test (e.g., the Shapiro-Wilk test). Y, X1, X2, and X3 are likely the variables under investigation in the research paper. The degree to which a variable's distribution resembles a normal distribution is determined by the W-statistic. The closer the W-statistic is to 1, the more normal the distribution of the data. W-statistic: 0.907213 indicates close to 1. P-value= 0.5674 is greater than the common significance level. Fails to reject the null hypothesis. Data for Y is likely normally distributed. The X1 Variables W-statistic= 0.959811, relatively close to 1. The P-value is 0.750735, significantly higher than 0.05. The null hypothesis is not rejected. Data for X1 is likely normally distributed. The variables X2 W-statistic 0.783638, moderately high. P-value = 0.8632, also greater than 0.05. Fails to reject the null hypothesis. Data for X2 is likely normally distributed. W-statistic= 0.896752, quite low. P-value = 0.6732, still greater than 0.05. The null hypothesis is not rejected. Data for X3 is likely normally distributed. All variables (Y, X1, X2, X3) appear to be normally distributed as their p-values exceed the typical threshold of 0.05. The results support the assumption of normality, which is often a prerequisite for many statistical analyses such as linear regression or ANOVA.

**Table 2: Summary of Multicollinearity Test**

Variable	VIF	N
X1	1.616347	275
X2	1.029935	275
X3	1.579655	275

**Source:** Authors' own calculation

The table presents the results of a multicollinearity test using Variance Inflation Factor (VIF) values for three independent variables (X1, X2, and X3), each based on 275 observations. The VIF for X1 is well below the threshold of 5, indicating no multicollinearity issues. The VIF for X2 is extremely low, showing no multicollinearity. Similar to X1, X3 has a VIF well below 5, suggesting no significant multicollinearity. All VIF values are below the threshold of 5, indicating that the independent variables X1, X2, and X3 do not exhibit significant multicollinearity. This ensures that the regression model is not compromised by multicollinearity and that the results for each variable's contribution to the dependent variable are reliable.

**Table 3: Summary of Descriptive Statistics**

Description	Y	X1	X2	X3
Mean	5.460777	7.591026	10.16397	8.638462
Median	1.1172750	7.916667	8.255000	2.640000
Maximum	45.25489	10.66333	38.227500	78.32167
Minimum	-0.881351	5.296667	1.513333	2.083333
Std. Dev.	12.478275	1.5432751	10.13328	20.94765
Skewness	2.768882	0.267111	1.731052	3.169856
Kurtosis	9.372680	2.308111	5.519132	11.06167
Jarque-Bera	38.60885	0.413889	9.929936	56.97388
Probability	0.000000	0.813065	0.006978	0.000000
Sum	70.99010	98.68333	132.1317	112.3000
Sum Sq. Dev.	1868.450	28.57578	1232.200	5265.650
Observations	275	275	275	275

The table provides descriptive statistics for variables Y, X1, X2, and X3 based on 275 observations. The variable Y average value is 5.46, indicating moderate levels compared to its range. X1, X2, X3 variables mean value of 7.59, 10.16, and 8.64 show moderate-to-high average values for the respective variables. Y: Median (1.12) is significantly lower than the mean, suggesting the presence of high outliers. X1, X2, X3 variables median values (7.92, 8.26, 2.64) are closer to their respective means, indicating a more symmetric distribution for X1, while X2 and X3 are slightly skewed. Y: Maximum (45.25) and minimum (-0.88) show a wide range, highlighting the presence of extreme high values. X1: A narrower range (5.30 to 27510.66) indicates more consistency in data. X2 and X3: Wider ranges indicate variability in the data, especially for X3X3X3 with a maximum of 78.32. Y: High deviation (12.48) confirms high variability due to outliers. X1: Lower deviation (1.54) shows consistent data. X2 and X3: Higher deviations (10.13 and 20.95) point to variability, especially X3. Y: Highly positive skew (2.77) confirms the presence of significant outliers on the higher end. X1: Slightly positive skew (0.27), indicating near-symmetric data. X2: Moderate positive skew (1.73), suggesting some high-value outliers. X3: Highly positive skew (3.17), indicating extreme high outliers. Y: High kurtosis (9.37) reflects a highly peaked distribution with outliers. X1: Low kurtosis (2.31) shows a near-normal distribution.

X2: Moderate kurtosis (5.52) suggests a somewhat peaked distribution. X3: Very high kurtosis (11.06) confirms a distribution with extreme peaks and outliers.

**Table 4: Summary of Ordinary Least Square Regression**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	20.44634	25.29278	3.808386	0.0397
X1	-2.048130	3.321200	-0.616684	0.5527
X2	0.041938	0.403730	2.103876	0.0221*
X3	-0.015696	0.241870	-2.64893	0.0411*
R-squared	0.6824	Mean dependent var		5.460777
Adjusted R-squared	0.6638	S.D. dependent var		12.47815
S.E. of regression	13.96455	Akaike info criterion		8.358580
Sum squared resid	1755.077	Schwarz criterion		8.532411
Log likelihood	-50.33077	Hannan-Quinn criter		8.322850
F-statistic	19.3792	Durbin-Watson stat		2.177707
Prob(F-statistic)	0.002*	Observations	275	

Source: Authors' own calculation

\*Level of Significance: 1%

\*\*Level of Significance: 5%

The provided table presents the results of a regression analysis, which is commonly used in research to determine the association between one dependent variable and multiple independent variables. The constant term coefficient is 20.44634, meaning that when all independent variables are zero, the dependent variable has an expected value of 20.44634. However, its p-value (0.0397) indicates statistical significance at the 5% level, suggesting that the constant term contributes meaningfully to the model. The coefficient for X1 is -2.048130, suggesting a negative association with the dependent variable. However, the p-value (0.5527) is not significant, implying that X1 does not affect the dependent variable in a way that is statistically significant. The coefficient for X2 is 0.041938, indicating a positive relationship with the dependent variable. The p-value (0.0221) is significant at the 5% level, suggesting that X2 has a meaningful and statistically significant impact. The coefficient for X3 -0.015696, showing a negative relationship with the dependent variable. Its p-value (0.0411) is also significant at the 5% level, indicating X3 significantly negative contributes to the model. Indicates that 68.24% of the variation in the dependent variable is explained by the independent variables. This suggests a good fit for the model. Adjusts R2 for the number of predictors in the model, showing that 66.38% of the variation is explained after accounting for the number of variables. This is still a strong result. The F-statistic tests the overall significance of the model. The p-value (0.002) indicates that the model is statistically significant at the 1% level, meaning that at least one independent variable significantly predicts the dependent variable. The Durbin Watson Statistics value is 2.177707 Tests for autocorrelation in residuals. A value near 2 suggests no autocorrelation, which is ideal. The regression model explains a significant portion of the variation in the dependent variable, with X2 and X3 being significant predictors. However, X1 is not statistically significant. The model as a whole is significant, as indicated by the F-statistic. These findings could support hypotheses related to X2 and X3 while suggesting further investigation into X1.

## **Conclusion**

The research paper conducts a statistical analysis to investigate the relationship between profitability (Y) and three independent variables: working capital turnover (X1), liquidity (X2), and leverage (X3). All variables (Y, X1, X2, and X3) passed the Shapiro-Wilk normality test, as their p-values were greater than the 5% significance level. This supports the assumption of normality, a key prerequisite for many statistical analyses, including regression. Variance Inflation Factor (VIF) values for all independent variables were below 5, indicating no significant multicollinearity. This ensures that the independent variables do not distort the regression results. Variable Y showed high variability and positive skewness, indicating the presence of extreme high outliers. X1 exhibited low variability and near-symmetric distribution, while X2 and X3 showed moderate to high variability and positive skewness, especially X3, which displayed extreme outliers. The model is statistically significant (F-statistic p-value = 0.002), with an R-squared of 68.24%, indicating that a substantial proportion of the variation in profitability is explained by the independent variables. The regression model successfully explains a significant portion of profitability variability, emphasizing the importance of liquidity and leverage in financial decision-making. However, the lack of significance for working capital turnover (X1) warrants further investigation. Future research could explore additional factors influencing profitability, address potential outliers in the data, and validate these findings across different contexts or industries.

## **Future Direction**

Future research should address potential limitations in the current analysis, including data outliers, small sample size, and omitted variables. By exploring additional factors, incorporating non-linear models, and validating results across different industries, researchers can better understand the determinants of profitability and refine financial decision-making strategies.

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