

## EVIDENCE FROM PAKISTAN'S NON-FINANCIAL SECTORS: A BEHAVIOR TESTING OF INVENTORY CONVERSION PERIOD AND FIRM PERFORMANCE

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### ABSTRACT

The principal purpose of this study is to investigate the relationship between inventory performance and a firm's performance. Research like this supports the theory that inventory performance influences business results. Data was retrieved from 102 manufacturing firms on the Pakistan Stock Exchange for 2017–2022. We analysed the panel data using E-Views from Virtual Spaces' statistical software, which includes procedures like regression, correlation, and OLS. The study outcomes revealed that all other variables are positively skewed except the Capital Intensity ratio. A shocking consequence establishes a negative connotation between inventory management and the firm's performance. Moreover, Leverage, Capital intensity ratio and net working capital also disclosed an adverse relationship with profitability. Inventory management has a positive link with Return on Equity. Return on Equity negatively correlated with Leverage and Assets Tangibility. It would be hard to overstate the importance of inventory management in financial management decisions. The administration must move carefully so that goods are not kept for too long unless necessary. Money can be better utilized by allowing it to earn interest or be invested in other ways rather than sitting idle. Researchers in emerging markets like Pakistan might use this study as a springboard to delve deeper into the basics of operations management.

**Keywords:** Return on Assets, Inventory Conversion Period, OLS, Pakistan, Return on Equity

### INTRODUCTION

Every company relies on effective inventory management to keep track of its raw materials, stock, Work in progress and finished goods. Sometimes, a business must purchase extra stock to avoid running out of a particular item; on other occasions, they may be concerned that their cash would be insufficient. Consequently, operation managers have a multi-pronged need to oversee inventory control.

An efficient inventory management system can substantially improve the effectiveness of supply chain activities. Companies can gain efficiencies in their production and distribution processes by enhancing on-time delivery, reducing lead times,

optimising inventory levels, and limiting risks of stock-outs and overstock.

In a manufacturing organisation, keeping tabs on stock levels is the primary function of the inventory control department. Ineffective stock management is still a significant source of financial loss and decreased production for many companies despite several solutions for this problem. In the past twenty to thirty years, several industrialised nations have adopted zero inventory systems, just-in-time (JIT), material requirements planning (MRP), and material requirements planning (MRPII).

The inventory management system determines the organisation's and the country's financial health

(Kwak, 2019). Regarding inventory management, manufacturing companies need more raw materials, products in production, and finished goods. That is why cutting back on raw material spending is so important. The company's top priority is avoiding sales delays due to raw material shortages. Abdul (2018)

Proper inventory management is crucial for any business involved in operations or production. Companies need to deliver orders promptly to retain customers and money. Akolafe, Olusipe, and Kolawole (2019),

Multiple studies have demonstrated that an efficient system for managing inventory has a profound effect on all aspects of a company's operations and validates the primary goal of the business, which is to maximise profits. Nigeria was the site of very few studies, including Deloof (2003), Rehman and Nasr (2007), and Abbas (2016).

For many businesses, keeping track of their inventory is a constant source of stress. Control over stock management relies on effective inventory management at every stage of the supply chain. Because ineffective stock management lowers profitability and increases customer losses, stock management practices are critical to a company's growth. Per Sonko and Akinlabi (2020).

### **Research Objective**

The primary goal of this research is to find out if better inventory management can boost a business's bottom line. To do this, we will analyse how it affects earnings, stock-outs, carrying costs, and cash flow. The study is divided into five parts. The study's background and aims are laid out in Chapter 1. The second chapter delves into the current literature regarding the topic. In Chapter 3, the study's data and methodology are detailed. The fourth chapter delves into the results. Lastly, chapter five discusses the study's shortcomings, draws conclusions, and suggests research topics for future studies.

### **LITERATURE REVIEW**

Nawaz et al. (2016) found that inventory performance affected the earnings of Pakistani enterprises. Secondary data from 46 Pakistan Stock Exchange-listed businesses and secondary data collected from 2010 and 2014 were utilised to achieve the result mentioned earlier. They employed

the following statistical procedures on the panel data: regression, Correlation, OLS Hausman, and GLM. The data showed a weak positive correlation between earnings from equity (ROE) and stock performance. The study found that both fixed and random effects were statistically significant, according to the Hausman test.

Prempeh, K.B. (2016) conducted a study to examine how inventory turnover affected business productivity. They looked at a cross-section of Ghanaian industrial businesses using secondary data gathered between 2004 and 2014. Regression models were used to evaluate the results of the inquiry. The findings showed that the firm's raw materials inventory had a strong and statistically significant correlation with its profitability.

Atnafu and Balda (2018) looked at how inventory performance approaches affected company efficiency and productivity in their 2018 study. The study used secondary sources and data from 188 micro and small-scale enterprises in Ethiopia. According to the findings, improved inventory management methods enhance organisational performance and competitive advantage.

Using data from the Saudi oil sector, Aljaaidi and Bagais (2020) explored the association between days of inventory remaining (DIO) and corporate success. From 2013 through 2019, data was gathered from energy companies that traded on the Saudi Stock Exchange. Findings were produced employing the Linear Regression models. The authors discovered an inverse relationship between DIO and energy businesses' efficiency.

In 2020, Nasution's finding out how the inventory turnover ratio affects the bottom line of automobile firms traded on the Jakarta Stock Exchange was the main goal of the research. Information was obtained from 18 separate producers between 2015 and 2017. The expected outcomes were produced by implementing fundamental linear regression analysis. Findings indicated a negative correlation between the inventory turnover ratio and return on assets.

Srouf and Azmy published it in 2021. The analysts examined the data to define the effect of inventory revenues on the firm's financial line. We used secondary sources such as the Egyptian Stock Exchange for our research. E-Views software's descriptive statistics and multiple regression models

were used to estimate the needed findings. A positive and statistically significant correlation between Inventory Turnover and ROA was found in the data. Researchers Afrifa, G. A. et al. (2021) investigated the correlation between an out-of-the-ordinary inventory and the stock market's performance. The UK industrial sector's data set spanning 2006–2015 is the basis of this study. Statistics for GMM regression were utilised. Based on the findings, accounts payable and receivable can help businesses manage inventory.

In 2023, Olaide and Omodero found out how the company's inventory management techniques have affected their efficiency and production, which is the main objective of this inquiry. From 2015 to 2019, the data was supplied by listed companies on the Nigerian Stock Exchange. We used the OLS method, descriptive statistics, and correlation to examine the data. The study found that inventory management significantly affected business performance.

The effectiveness of logistic management on Ghanaian roof steel companies was studied by Adelwini, B. B. et al. (2023). The study's primary data was mainly gathered through the use of questionnaires. The responses of ninety-seven members of management were studied using intentional sampling. Using multiple linear regression, the researchers determined that logistics management enhanced both organisational performance and the inventory management system.

Altaf and Ali (2023) set out to determine whether there was a connection between efficient inventory management and monetary results for companies. A cross-sectional survey was used to gather responses from prominent Pakistani textile industry professionals. To get a sense of things, we sent out 150 questionnaires. The results of the investigation were assessed using a regression model. According to the research, textile companies' bottom lines improved when their inventory management systems were more efficient.

Chebete, E., and Kithaka, S. (2019) are among the numerous experts who carried out the research. Lwika, Ojera, Muganda, Wachira (2013), Sitienei and Memba (2016), and beyond. In 2003, Deloof.

**METHODOLOGY**

Determining the influence of inventory management proxies on profit and the relationship between inventory management and a company's bottom line were the key goals of this research. This analysis used a secondary data set that included 102 companies listed on the Pakistan Stock Exchange and covered 2017–2022. The six industries that were the focus of this investigation were automobile, technology, textiles, cement, chemicals, and industry. Panels uniformly received 624 observations. Virtual Space Perspectives Several statistical tests were applied to the panel data, such as descriptive correlational analysis and OLS.

**Table: 1**  
*Variables Calculations:*

Variables	Definitions	Source
ROA	Net Income/ Total Assets	(Mappanyuki & Sari, 2017 (Sari and Mappanyuki, 2017)
ROE	Net Income/ Capital	Farooq, U. (2019)
ICP	Average Inventory/ Sales	Ibrahim, A. K. et al. (2022)
LEV	Total Debts / Total Assets	Kroes et al. (2018)
AT	LN of Assets	Ballou, R. H. (1981)
CIR	Total Assets/ Total Sales	Sitienei and Memba (2016)
NWC	LN (Current Assets - Current Liability)	

**Model Specifications**

The subsequent equations delineate the models that illustrate the influence of inventory management on the performance of an organisation. Regression analysis is based on linear equations tested by Sitienei and Memba (2016).

**Equation: 1**

$$ROA_{it} = \alpha + \beta_1 ICP_{it} + \beta_2 LEV_{it} + \beta_3 AT_{it} + \beta_4 CIR_{it} + \beta_5 NWC_{it} + \epsilon_{it} \dots \dots \dots (1)$$

Whereas:

- ROA: Return on Assets
- ICP: Inventory Conversion Period
- LEV: Leverage
- Total Assets: Total Assets
- CIR: Capital Intensity Ratio
- NWC: Net Working Capital

Where:  $\beta$  used for coefficient  
 $\epsilon_{it}$  = Error term

**Equation: 2**

$$ROE_{it} = \alpha + \beta_1 ICP_{it} + \beta_2 LEV_{it} + \beta_3 AT_{it} + \beta_4 CIR_{it} + \beta_5 NWC_{it} + \epsilon_{it} \dots \dots \dots (1)$$

Whereas:

- ROE: Return on Equity
- ICP: Inventory Conversion Period
- LEV: Leverage
- Total Assets: Total Assets
- CIR: Capital Intensity Ratio
- NWC: Net Working Capital
- Where:  $\beta$  used for coefficient
- $\epsilon_{it}$  = Error term

**Results and Discussions**

This study examines how inventory management impacts the success of Pakistan's manufacturing sectors. ROA and ROE are selected dependent variables, while Inventory Conversion Period (ICP), Leverage (LEV), Assets Tangibility (AT), Capital Intensity Ratio (CIR), and Net Working Capital (NWC) are independent variables. The relationship between dependent and independent variables is checked using two econometric Equations.

**Table 2**  
 Regression Analysis

	ROA	ROE	ICP	LEV	AT	CIR	NWC
Mean	0.067	0.454	0.096	0.271	16.804	0.503	14.826
Median	0.061	0.449	0.088	0.262	16.812	0.497	14.746
Maximum	0.471	0.928	0.389	1.202	20.845	0.934	20.276
Minimum	0.007	0.002	0.000	0.000	13.705	0.022	9.398
Std. Dev.	0.101	0.208	0.067	0.185	1.279	0.187	1.584
Skewness	0.290	0.983	1.466	0.586	0.129	-0.011	0.256
Kurtosis	6.110	8.693	6.729	4.193	2.989	2.490	4.105
Jarque-Bera	255.195	925.131	573.813	71.291	1.694	6.644	37.840
Probability	0.000	0.000	0.000	0.000	0.429	0.036	0.000
Observations	612	612	612	612	612	612	612

Important statistical details about the selected variables are available in Table 1. The average value of ROA is 0.067, and the standard deviation is 0.101. ROE shows a mean of 0.454; the standard deviation is 0.208. The mean value of ICP is 0.096, and the standard deviation is 0.067. The skewness of all the variables is positive except for CIR.

also shows a positive link between AT and ROA. Inventory management has a positive link with ROE. ROE negatively correlated with LEV and AT.

**Table: 3**  
 Correlation Model

	ROA	ROE	ICP	LEV	AT	CIR	NWC
ROA	1.000						
ROE	0.442	1.000					
ICP	-0.141	0.026	1.000				
LEV	-0.471	-0.646	0.245	1.000			
AT	0.181	-0.152	-0.226	-0.052	1.000		
CIR	-0.356	0.022	-0.105	0.082	0.062	1.000	
NWC	-0.041	0.025	-0.131	-0.045	0.255	0.206	1.000

Table 3 demonstrates the relationship of independent variables with dependent variables. A surprising outcome found a negative association between inventory management and the firm's performance. Moreover, LEV, CIR and NWC also reveal an adverse relationship with profitability. The study

**Table: 4**  
 Panel Least Squares  
 ROA as Dependent Var

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.157	0.052	-3.043	0.002
ROE	0.193	0.021	9.312	0.000
ICP	-0.160	0.051	-3.163	0.002
LEV	-0.081	0.024	-3.402	0.001
AT	0.020	0.003	7.503	0.000
CIR	-0.199	0.017	-11.559	0.000
NWC	-0.004	0.002	-1.802	0.072
R2		0.438	MDV	0.067
Adjusted R2		0.432	S.D. dependent var	0.101
SER		0.076	AIC	-2.293
SSR		3.537	SIC	-2.242
LL		708.594	H-Q	-2.273

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



As a result of the above OLS model, return on Assets is used as a dependent variable, which indicates that the t-value ICP is -3.163, and the inventory system significantly negatively affects the firm's performance. Furthermore, leverage has a significant negative impact on profitability; it is noted that ROE has a significant positive effect on firm performance, which means that the firm may flourish in its business while using equity rather than debt. Moreover, the t-value of Assets tangibility shows that a firm may perform well while using the assets correctly. A company having more assets may get more debt from financial institutions. NWC has an insignificant negative impact on profitability. Lastly, the value of R2 indicates that 43% of the independent variable explains the dependent variable.

**Table: 5**  
*Panel Least Squares*  
*ROE as Dependent Var*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.920	0.088	10.500	0.000
ROA	0.648	0.070	9.312	0.000
ICP	0.586	0.090	6.486	0.000
LEV	-0.639	0.036	-17.907	0.000
AT	-0.036	0.005	-7.551	0.000
CIR	0.227	0.034	6.765	0.000
NWC	0.007	0.004	1.768	0.078
	R2	0.552	MDV	0.139
			S.D. dependent	
	Adjusted R2	0.432	var	0.454
	SER	0.140	AIC	-1.084
	SSR	11.850	SIC	-1.033
	LL	338.594	H-Q	-1.064

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The above table indicates the significance and insignificance of the variables. The t-value of ICP reveals a significant positive effect on the firm performance; it demonstrates that the company should stock the inventory, which has more demand to increase sales. Moreover, leverage and asset tangibility have a negative significant effect on the equity of the firm. CIR has a significant positive relationship with equity. The more the capital intensity, the more capital an investor will need to commit to the business. NWC has also shown a positive but insignificant impact on the company's equity. Lastly, the value of R2 indicates that 43% of

the independent variable explains the dependent variable.

**CONCLUSIONS**

This study primarily aims to examine the effects of inventory management on business results. Data was collected from 102 Pakistan Stock Exchange businesses between 2017 and 2022. We looked at inventory performance, ROA, asset tangibility, capital intensity ratio, leverage ratio, net working capital, and return on assets, besides return on equity, to see how these variables affected the company's Performance. The skewness of all the variables is positive except for CIR.

A surprising outcome found a negative association between inventory management and the firm's performance. Moreover, LEV, CIR and NWC also reveal an adverse relationship with the company's profitability. There is a weak but favourable relationship between inventory performance and return on equity (ROE).

Since a positive and statistically significant relationship exists between inventory management and performance in sports events, our working hypothesis is that improved inventory management leads to higher performance levels.

According to the results, successful inventory management is critical to Pakistani companies' success. A more optimistic outlook on healthy performance is favourably associated with inventory performance among Pakistani manufacturing businesses. Our research indicates that operational management should make inventory performance a top priority. Since the findings are consistent throughout our tests, we can trust them.

**Limitation of Study**

According to the study's limitations, research facilities in developing countries like Pakistan could be much better. More extended data sets provide more reliable conclusions, but collecting data over such long periods is a real challenge. You can also break down inventory into its parts and assess things like work in progress, fixed objects in transit, and receivables.


### Recommendation

The study's authors state that using an inventory control management system can help businesses enhance their storage system and control management.

Future research in poor economies, such as Pakistan's, should pay more attention to the central issue in operations management studies, and this study lays the groundwork for it.

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