

## THE IMPACT OF INVENTORY MANAGEMENT ON FIRM PERFORMANCE: EMPIRICAL STUDY ON JORDANIAN INDUSTRIAL SECTOR

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### Abstract

The principal aim of this research is to explore how managing inventories—particularly the inventory cycle duration and stock turnover ratio—affects the financial efficiency of industrial enterprises in Jordan. Furthermore, empirical work considers the role of firm scale and financial leverage as controlling elements. To achieve this, a quantitative methodology was adopted, relying on panel data regression techniques. The analysis included 28 industrial firms listed on the Stock Exchange of Amman Stock Exchange, utilizing archival data sourced from official financial statements over the span of 17 years (2006–2023). The outcomes reveal that longer inventory cycles have a statistically significant negative influence on business profitability. In contrast, higher turnover rates are positively correlated with improved economic performance. Hence, the fewer days required to convert stock into revenue, the better the firm's financial return. This paper concludes that efficient inventory practices contribute meaningfully to organizational success. It advises decision-makers to reduce the inventory cycle due to its tangible impact on profitability. Notably, the study's finding also indicates that enterprise size exhibits no substantial influence on financial effectiveness.

**Key words:** inventory management, inventory turnover ratio, inventory conversion period, firm performance.

### Introduction

Inventory management is a vital element of operational efficiency and firm's financial performance in today's businesses. It involves studying method of ordering, keeping, and utilizing a firm's inventory—both finished goods and raw materials. Effective inventory management ensures that a firm keeps the optimal level of stock to meet customer requests without undertaking excess costs or experiencing stock shortage. In 2015, two thousand of the top companies in the United States and Europe invested roughly \$187.5 billion and \$820 billion in unnecessary inventory. This situation showed inefficiencies in inventory management (Afrifa et al. 2021). Inventory management is widely defined as an effective tool for cost minimizing and profit maximization (Isaksson and Seifert 2014). Inventory volatility leads to considerable risk of adverse financial results for firms, given its crucial role in operational activities. Current assets, consisting of inventory, formed 61.7% of the total assets (Re-yarus, Fernández-López, and Rodeiro-Pazos 2021). Investments in current assets specially in inventory and accounts receivable represent a significant portion of total investments in many companies (Nwude, Allison, and Nwude 2021; Özkaya and Yasar 2023).

In this study, we focused primary on how the financial performance of Jordanian industrial companies is affected by inventory management. Starting from proper inventory management will lead to enhance firm performance profitability and minimizing cost. Management of inventory related to all the operations that goes into keeping the suitable level of inventory at the proper time, place and volume and include the managing, coordinating, purchasing, and how inventory is used for production (Prempeh, 2016) [6]. To enhance firm

performance and minimize the costs, Peterson and Joyce (2007) stated that the contribution of inventory management is possible by the following:

1. Less dependent on outside sources through produce inventory needed by a company itself.
2. Develop inventory control systems to reduce inventory costs and maximize profitability.
3. Appropriate implementation of monitoring procedures and planning on the usage of inventory and tangible assets turnover ratio.

Jordanian industrial sector chosen for this study because there has been little research that studied the impact of inventory management on company profitability. Hence, most studies on inventory management have predominantly been conducted in other environments and very few is available in Jordan. The paper question is considering the following: Does inventory management affect the profitability of the Jordanian industrial sector? To address this question, the paper used quantitative research methodology considering multiple regression analysis. We employ panel data models especially fixed effects models. Moreover, we selected a set of variables that may affect the profitability of the firm. Data is collected from annual financial. As far the researcher knows, this research is the first to explore the link between inventory control and business profitability for Jordanian manufacturing firms. It is presumed that the findings gained will enhance the understanding of how inventory practices affect the earnings of industrial companies in Jordan. Outcomes may be useful to firm managers in recognizing their role in maintaining stock levels efficiently.

Hence, the aim of this paper is to analyze how the financial performance of Jordanian industrial companies is affected by inventory management. Specifically, the goal is to explore the connection between inventory operations and the financial outcomes of Jordanian manufacturers. More precisely, it investigates how inventory turnover and stock conversion periods affect returns on assets in the industrial sector of Jordan. It's aims to bridge the existing gap in the literature regarding the alliance between stock control and profitability of manufacturing companies in Jordan, and how such management practices contribute to improved firm outcomes and the national economy.

The structure of the paper is as follows: Section 2 outlines a comprehensive survey of past research and develops the hypotheses. Section 3 explains the research method and design adopted. Section 4 discusses data analysis and empirical results. Finally, Section 5 concludes the research.

### **Literature review**

Numerous studies have addressed the topic of inventory management and its effect on the profitability of companies. This is due to the influence of inventory management on the company's capacity to reduce costs and thus increase the firm's profitability. The element of profitability is one of the main factors that the investor looks at. This paragraph reviews several studies that deal with the topic of inventory management and its bonds with profitability.

Yeboah, et al.(2025) examined the impact of inventory turnover on operating profit margin in both firms with constant demand for their products and that are highly sensitive to the demand for their products. which included consumer goods companies in the United States. The sample included 522 companies during the period 2010 to 2022, using GMM to analyze the data and extract conclusions. The output showed that there is an inverse alliance between inventory turnover and operating profit margin in consumer goods companies, which requires these

companies to reduce inventory turnover (108 days) to increase profitability by 3%. shows that companies should develop an inventory management policy that considers demand conditions and changing economic conditions to enhance the profitability of FMCG companies.

Yeboah, S., and F. Kjærland(2024) test thetie between the components of capital on the operational efficiency of consumer goods companies for the period 2005-2022 and applied to 61 consumer goods companies. Using generalized method moments (GMM), random effect, and ordinary least squares (OLS). The outcomes indicated a degrading correlation between working capital and operating expenses, while a positive association was observed with operating profits. Furthermore, the analysis demonstrated that a higher working capital ratio contributes to a longer cash conversion cycle, highlights that efficient management of accounts receivable, stock turnover, and accounts payable significantly contributes to optimizing the conversion cycle of cash. Proper control over these components enables firms to maintain liquidity, reduce unnecessary financial burdens, and ultimately enhance their operational profitability, which leads to reducing costs.

Using data from 78 Saudi manufacturing firms, (Alnaim and Kouaib, 2023) conducted a study to examine the effect of inventory turnover on the level of profitability in manufacturing sector for the period from 2017 to 2021. based on the data extracted from the financial statements of the study's sample . We used return on assets, earnings per share, and gross profit margin as measures of profitability, and the inventory turnover ratio as an independent variable, and used several control variables including company size, leverage, market value to book value, Growth in sales, number of directors, COVID-19 effect. used a fixed effects model to test the alliance between variables. The results showed that high inventory turnover leads to reduced costs and thus increased profitability, and that size contributes positively to profitability, while leverage has an adverse influence on the profitability of industrial companies.

Ikechi et al. (2023) examined the effect of inventory management on the performance of 11 out of 56 manufacturing companies registered on the Nigerian Stock Market for the period 2012 to 2021. Considering panel model hypotheses of were tested. The returns reveal that: The cash conversion cycle (CCC) has an adverse influence on the return on assets (ROA) of the sample production companies, and the accounts receivable ratio has a positive significant effect on the return on assets. The accounts payable turnover variable positively effect on the return on assets and recommended that manufacturing companies should accelerate the inventory cycle to increase profitability.

Adegbite, T., and Ajagbe, S. (2023) performed a study on the influence of inventory management on the performance of 10 industrial companies in Nigeria, specifically the effect of inventory management on return on equity. The data was obtained from the annual financial statements of the companies for the period 2011-2021. The variables included inventory (crude materials, semi-finished products and finished products), non-current assets, accounts receivable turnover, and equity-shareholding as independent variables. The returns indicate that the Fixed Effect Model showed a positive connection between inventory and return on ownership, while non-current assets had a degrading impact on profitability. While the accounts receivable, turnover and stake had a successful effect on return on net assets. recommended that the companies should focus on inventory management to enhance the profitability of production-based enterprises in Nigeria.

Ali, H. and Khan, N (2021) performed study to investigate the relationship between inventory management and the profitability of 35 industrial firms registered on the Stock

Exchange of Pakistan for 8 years. As a measure of profitability, return on assets (ROA) and return on shareholder equity (ROE) were used as dependent variables, and raw materials, materials under manufacturing and finished materials were used as a measure of inventory, generalized method moments (GMM) was used to explore out the nature of the relationship between the study's variables. Findings showed that completed products have a positive effect on financial performance measured by return on assets, while raw materials and materials under manufacturing have a degrading effect on performance, on the other hand, completed products and raw materials is positively associated with financial performance measured by return on equity, and materials under manufacturing have an adverse impact on performance.

Gólas, Zbigniew (2020) conducted study to examine the link between inventory management and the profitability of Polish industrial sector companies for the period between 2013 and 2019. He used return on assets (ROA) as the dependent variable and a measure of performance, total inventory and its components represented by raw materials, semi-finished materials, finished materials and goods were used as independent variables. Panel regression was used to test the connection between inventory components and financial performance of Polish factory-driven companies, and the returns of assets, which plays a key role in improving that there is a statistically significant connection between inventory efficiency and its components except for final products and economic performance of companies. The findings of the investigation revealed that the average storage period for semi-finished materials and raw materials has a strong correlation with the profitability of companies, and that the increase in the average storage period has a harmful and strong effect on the return on assets for Polish mechanical companies.

Rodrigo et al. (2020) examined the influence of inventory management on the performance of Sri Lanka manufacturing firms for a period from 2014 - 2018. The output revealed that inventory conversion recycling has a negative effect on the return on assets level, the market value of the firms, and the cash flow derived from operations. As a result, Profitability increase with a quicker inventory turnover. Furthermore, the returns reveal no connection between inventory turnover and financial performance.

Elsheikh and Hassanin, (2019) based on secondary data collected from (50) Egyptian listed firms to examine the effect of inventory management on Egyptian companies' financial performance during the period from 2012 to 2019. The findings from the panel data analysis showed that inventory management had an insignificant impact on companies' financial performance.

Firm performances have received several attempts by academics and researchers in the field of business but evidence-based literature on the nature of the relationship between inventory management and firm performance in industrial firms in Jordan is rare. Prior reviews of studies on inventory management on firm performance showed that effective inventory management needs serious attention to achieve success. Considering the output of the above research, the researchers hypothesized that:

H1: The Inventory Conversion period has an optimistic impact on return of assets of Jordanian industrial sector.

H2: The Inventory Turnover Ratio has a beneficial impact on return of assets of Jordanian industrial sector.

H3: The firm's size has a positive impact on return of assets of Jordanian industrial sector.

H4: The leverage Ratio has a positive impact on return of assets of Jordanian industrial sector.

### Methodology and Research Design

The analysis examines the relationship between inventory management and firm performance of industrial sector in Jordan. shows secondary data, which was gathered from the published annual financial statements of Jordanian industrial firms, listed in the stock exchange of Amman. The research excluded companies with unavailable data. The sample of this paper consist of 28 companies operating in the Jordanian industrial sector from 2006-2023. The Amman Chamber of Industry has classified them into five-industry groups. With 198 observations overall, the Mining and Extraction industry has the most company-year observations of any of these industry categories.

The current research tries to undertake fundamental variables that related to inventory management of Jordanian industrial, selected dependent, independent and control variables. Table 1. Describes chosen variables and their measuring methods.

**Table 1. Study's variables**

Variables		
<b>Dependent variable</b>		
<b>ROA</b>	Return on assets	Net profit/total assets
<b>Independent variable</b>		
<b>ICP</b>		(Inventory/cost of goods)*365
<b>ITR</b>		cost of goods/ Inventory
<b>Control Variables</b>		
<b>FS</b>		Logarithm of Sales
<b>LEV</b>		Total Liabilities/ Total Asset

Source: preparation of the author

### Fixed Effect or Random Effect

The existence of a fixed effect or random effect was evaluated to choose the suitable model. To determine which of the random effect and fixed effect approaches was better, we used Hausman test. In essence, the Hausman test is used to test the null and alternative hypotheses:

H0: random effect model is the most appropriate model

H1: hypothesis that a fixed-effect model is more appropriate.

When the recorded p-value is less than 0.05, the null hypothesis is typically rejected. According to the outcome prob. = 0.002. The fixed effect model is therefore recommended for this study, and it is concluded that there exist fixed effect. In general, the model was revealed as:

$$ROA = \beta_0 + \beta_1 ICP_{i,t} + \beta_2 ITR_{i,t} + \beta_3 FS_{i,t} + \beta_4 LEV_{i,t} + \mu_t \quad (1)$$

Where ROA: refers to the Return on assets owned by firm

$\beta_0$ : is the intercept of the model

$ICP_{i,t}$ : Inventory conversation period for the firm I at t time.

$ITR_{i,t}$ : Inventory Turnover ratio for the firm i at t time.

$FS_{i,t}$ : firm size for the firm i at t time.

$LEV_{i,t}$ : leverage for the firm i at t time.

$\varepsilon_{i,t}$ : the error term of model.



## Data Analysis and Discussion

To examine the impact of inventory management on firm performance of Jordanian industrial sector, Inventory Conversion period (ICP), Inventory Turnover Ratio (ITR), were used as the explanatory variables, Return on assets the dependent variables, while firm size and leverage as a control variable. A seventeen-year period of industrial firm in Jordan was carried out and data was obtained from Annual financial reports of all companies.

### 1. Descriptive statistics

The primary summary of the descriptive statistics for return on assets, Inventory Conversion period (ICP), Inventory Turnover Ratio (ITR), company size, and leverage variables used in this research is displayed in table 2. Results in Table 2. Showed that the average return on assets was 0.037, an indication of positive profitability for most industrialized organizations. The examination also showed the average Inventory Conversion period was 159 days, which means that on average it takes industrialized organizations 159 days for inventory to be transformed into sales. As such, the average inventory turnover was 3.189, which means that it takes 3 days for heavy-duty organizations to sell their inventory. The average percentage of leverage ratio is 58.70%. A final observation was a significant average firm size (7.376), an indication of the good growth of technological organizations in Jordan.

Table 2. Descriptive Statistics

	ROA	ICP	ITR	FS	LEV
<b>Mean</b>	0.037	159.642	3.189	7.376	0.587
<b>Median</b>	0.039	140.501	2.598	7.328	0.618
<b>Maximum</b>	0.316	321.250	14.267	9.178	0.996
<b>Minimum</b>	-0.222	25.583	0.700	6.032	0.011
<b>Std. Dev.</b>	0.092	85.735	2.088	0.650	0.262
<b>Skewness</b>	-0.178	0.717	1.708	0.684	-0.329
<b>Kurtosis</b>	3.118	3.032	6.493	3.602	1.924
<b>Jarque-Bera</b>	2.784	40.765	473.357	44.347	31.543
<b>Probability</b>	0.249	0.000	0.000	0.000	0.000
<b>Sum</b>	17.476	759.894	151.995	351.760	279.587
<b>Sum Sq. Dev.</b>	4.030	349.146	207.018	200.798	32.673
<b>Observations</b>	476	476	476	476	476

Source: preparation of the author

### 2. Correlation

Table 3. show the nature of the correlation connection between dependent and independent variables. Inventory Conversion period (ICP) and Inventory Turnover Ratio (ITR) have a greater correlation coefficient (correlation of 0.35), according to the correlation values. leverage (LEV) and Inventory Conversion period (ICP) have the lowest correlation coefficient of -0.09. Overall, all coefficient correlation values are less than 0.50 and higher than -0.50 indicating that no multicollinearity problem is found.

Table 3. Correlation

	ROA	ICP	ITR	FS	LEV
ROA	1.00				
ICP	-0.10	1.00			
ITR	0.09	0.35	1.00		
FS	0.24	-0.26	0.18	1.00	
LEV	0.19	-0.09	0.06	-0.14	1.00

Source: preparation by the author

## 2. Unit roots

The returns of the unit root test for the examination variables are shown in Table 4, by running Im, Pesaran, and Shin and Levin, Lin, and Chu tests. Output of the tests showed that the dependent variable return on assets (ROA) is integrated at level and at First difference on both tests. In addition, results show that the independent variable ICP is stationary on both level and first difference, while the variables of FS and LEV are non-stationary at level as Im, Pesaran and Levin, Lin & Chu indicated, while all variables are stationary at first difference. As shown on table 4. Time series were not integrated at the same degree of integration, while all variables are stationary at First difference on both tests.

Table 4. Unit roots test results

Variables	Im, Pesaran and Shin W-stat				Levin, Lin & Chu			
	Level		First difference		Level		First difference	
Dependent Variables	Statistic	Probability	Statistic	Probability	Statistic	Probability	Statistic	Probability
ROA	-5.056	0.000	-10.398	0.000	-6.283	0.000	-8.985	0.000
<b>Independent Variables</b>								
ICP	-4.666	0.000	-7.890	0.000	-5.234	0.000	-7.546	0.000
ITR	-11.430	0.000	-7.328	0.000	-12.464	0.000	-5.193	0.000
FS	-2.335	0.110	-4.786	0.000	-3.266	0.121	-4.481	0.000
LEV	0.976	0.210	-3.827	0.001	-1.667	0.137	-3.938	0.000

Source: preparation by the author

## Results and discussion

The empirical findings obtained by examining the influence of the explanatory variables (ITR, ICP, FS, and LEV) on the level of the profit of Jordanian industrial using a fixed effect model analysis (FEM) technique are displayed in table 4. The R-squared value, which quantified the degree of variation in the dependent variable brought about by the explanatory variables, was 0.531, as table 4 illustrates. Accordingly, R-squared shows that a variation in inventory turnover ratio (ITR) and inventory conversion period (ICP), firm size (FS) and Leverage (LEV) account for 53.1% of the variation in the return on assets (ROA) of listed Jordanian industrial firms, while the remaining 46.9% could be explained by other variables not encompassed in this study.

According to findings shown in the table 4, we deduce a favorable relationship between inventory turnover (ITR) and the profitability level of the Jordanian industrial companies. At the

5% level, the inventory turnover (ITR) coefficient is positive and statistically significant. This suggests that Jordanian industrial companies are more profitable when their inventory turnover ratio (ITR) is higher. Additionally, it indicates that Jordanian industrial firms' financial performance will rise by 0.706 for every unit increase in (ITR). According to the finding, the Jordanian industrial sector can sell its supplies promptly and effectively manage its inventory, both of which have a beneficial impact on its profit level. This provides support to the hypothesis, which suggests that there is a substantial correlation between inventory turnover and the degree of profitability of the Jordanian industrial firms. Our findings show that effective inventory control positively affects firms' performance. This result consists of research by Ahmed (2016) who found out a positive tie between inventory management and firm performance. Similar findings were also discovered by Mulindabigwi and Mulyungi (2017), Otuya, S. and Eginiwin (2017) and Ashraf, M.S.A. and Muhannad, A.A. (2017).

Table 4 shows that the performance of Jordanian industrial firms is significantly correlated with the inventory conversion cycle. The performance of Jordanian industrial firms is inversely correlated with the Inventory conversion period (ICP), as indicated by the negative (-0.687) and significant at the 5% level coefficient value. In other words, shorter days in Inventory conversion period (ICP) is inversely related and tend to improve the performance of Jordanian industrial firms. This suggests that a company with shorter cycles is probably more efficient than one with longer cycles. Therefore, reducing the number of days of the inventory cycle may improve firm performance. These results are in line with the studies of Hashed and Shaik (2022), Alnaim and Kouaib (2023), and Akintola (2023). Therefore, a Jordanian industrial firm is bound to earn little profits if it takes long time to transfer inventory to sales.

The coefficient value of Firm size (FS) is positive (0.008) and significantly statistical with the profitability of Jordanian industrial firm. Firm size has a mixed and sometimes contradictory tie with profitability. Large companies often experience advantages like easy access to funding and economies of scale, which increase their ability to achieve profitability. On the other hand, larger firms may face some challenges such as high costs and bureaucracy, which leads to reduced profitability. The nature of the tie is not always linear, and some researchers say that profitability can initially grow with size but eventually reduce as firms continue to grow. This result consists of the argument that big firms can realize economies of scale by increasing production and minimizing costs and thus maximizing the profitability level.

However, outcomes of Table 4 show that the leverage variable has an adverse and statistically significant effect on the performance of Jordanian industrial firms at the 1% level with coefficient -0.169. This means that firms with a high leverage ratio generate profit less than firms with low leverage ratio. This result is in line with the work of Asduzzaman and Chowdhury (2017), and Kasozi (2017). However high debt ratio is negatively influencing the profitability of Jordanian industrial firms.



Table 4. Fixed Effect Models Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>c</b>	10.245	1.125	9.102	0.000***
<b>DSI</b>	-0.687	0.287	2.561	0.021**
<b>ITR</b>	0.706	0.261	2.709	0.017**
<b>FS</b>	0.008	0.018	0.433	0.165
<b>LEV</b>	-0.169	0.042	-3.990	0.000***
R-squared	0.531			
Adjusted R-squared	0.483			

Source: preparationby the author

### Conclusions and Recommendations

Inventory management is a vital instrument used to improve the performance and quality of assets of a firm. It is a system used to manage a firm's inventory in a way that enhances profits and minimizes losses. Therefore, successful inventory management in an industrial and manufacturing business is vital as inventories form a significant part of the management responsibility. Despite the growing interest in the effects of inventory management on the performance of industrial sector, comparatively little research has been done on the relationship between inventory management and a company's profitability, particularly in developing countries like Jordan. The lack of research on this relationship in the Jordanian industrial sector is what motivated the current study. Owing to the conflicting results of earlier research on inventory management and its effect on business profitability, this study applies statistical tests to a sample of industrial enterprises in Jordan from a variety of industry groups to shed additional light on this topic. As a result, secondary data from Jordanian companies published annual statements spanning 17 years was used to collect the data for this study. There are 28 companies in the study's sample.

The objective of this study was to examine the impact of inventory management on the financial performance of industrial companies in Jordan. According to that, the explanatory variables used in the research are inventory turnover ratio (ITR) and inventory conversion period (ICP), which are inventory management's proxies. used control variables, which were gained through previous studies. These control variables were used to understand more the influence of explanatory variables on the consequences obtained and to give credible results. The control variables employed are firm size and leverage. Moreover, the dependent variable used in is return on assets as a proxy for the financial performance of Jordanian factory-driven companies.

The findings revealed that the inventory conversion period (ICP) has a notable negative impact on the profitability of Jordanian industrial sector, whereas the inventory turnover ratio (ITR) contributes positively. Regarding other factors, firm size was associated with improved outcomes, while leverage had the opposite effect. These insights indicate the importance of reducing the duration of stock processing and enhancing turnover rates to achieve better results.

Moreover, the study offers deeper insight into how stock-related decisions affect financial health in this sector. It advises company leaders to shorten the cycle of goods handling and to consider expanding the size of their businesses, as this was shown to support overall success.

One limitation is the exclusive reliance on return on assets as a performance indicator. Additionally, the research did not include a wider range of relevant variables. Future investigations are encouraged to explore other potential influences within this context

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