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The Nexus Between Inventory Management and Firm Performance: A Saudi Arabian Perspective*

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Abstract

The current study examines the relationship between inventory management efficiency and financial performance in Saudi Arabian companies. The study collected data from the companies listed on Tadawul (a Saudi Arabian stock exchange) during the period starting from 2016 and ending in 2020. The study uses pooled regression model by incorporating Return on Assets (ROA) and Inventory Turnover Ratio (ITR) as a performance measurement variable and inventory conversion period as an inventory management variable to report the results. The results show a positive and significant association between inventory management and firms' financial growth measured in terms of Return on Assets (ROA). Further, the study reports a positive and significant association between the inventory conversion period and inventory turnover (ITR). This shows that managing inventory efficiently shall positively impact the firm's performance. The other variables, such as debt ratio and gross profit, are positively related to ROA and negatively correlated with ITR. The firm growth is positively associated with both the dependent variables. The results suggest that the management of inventory in Saudi Arabian firms is efficient. Further, the firm size is positively associated with ROA and ITR. This shows a nexus between inventory management efficiency and firms' financial growth in Saudi Arabian companies.

Keywords: Inventory Turnover Ratio, Inventory Conversion Period, Return on Assets, Firm Growth, Financial Performance

JEL Classification Code: L25, L66, M40, M41

1. Introduction

Generally, manufacturing and merchandise companies keep raw materials, work-in-process, and finished goods inventory as a hedge against running out of required items. However, hedging these inventories to a large extent leads to higher and implicit costs, after which the companies have changed the approach to managing efficient inventories. The main objective of managing efficient inventories is supplying the inventory in good quality and quantity, and the requirement to achieve this is to maintain order levels. Currently, the management of inventory has become a significant contributing factor for all the companies, hence gaining more prominence. When the management of inventory is poor, it becomes an idle asset which ultimately reduces the liquidity and investment in productive assets, thus leading to meager profits. Therefore, planning and control of inventory bring in equal substitution between benefits and losses of holding inventories.

There is a direct and significant relation between managing efficient inventories and profit. An organization's efficient inventory management allows them to maintain an optimum level of inventory aligned with the objectives. The purpose of maintaining an optimum inventory level by a firm is to meet the orders in time, which reduces the cost of inventory, leading to profits and customer satisfaction. A firm with poor inventory management faces long-term growth problems; hence, the firm's survival becomes difficult. A firm's

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optimum inventory management brings in high inventory turnovers, a decrease in days' sales in inventory, and a low ratio of inventory to sales leading to better financial growth (Shah & Shin 2007). A firm's financial performance depends upon the balance between inventory acquiring costs and the inventory holding period (Muchaendepi et al., 2019). Some firm keeps products as inventory to guarantee uninterrupted sales, whereas inattention decreases profits and affects firms' competitive position (Michalski, 2008; Gołaś, 2020b). Many internal and external factors influence the management of inventory, which in turn impacts the business's profitability.

The past research examining the influence of efficient inventory management on the firms' financial growth is found largely in other parts of the world. But, at the same time, it is meager in the GCC nations, specifically the Kingdom of Saudi Arabia.

2. Literature Review

Koumanakos (2008) studied the role of lean inventory management in enhancing firm growth in large and medium firms in Greece. He found that higher level inventories lower the firm growth, while the opposite is true. Rajeev (2008) examined the practices of inventory management affecting the financial performance of Indian SMEs. He reported that SMEs have limited inventory management practices due to a lack of some factors. He found a positive association between performance indicators and practices of inventory management in SMEs. Aminu (2012) studied the determinants of inventory management as an important component of firms' working capital that directly or indirectly affects the firms' profitability. The study reported that firms with efficient working capital and optimum inventory management practices impact their profitability and liquidity.

Robert Nyamao and Patrick (2012) examined the inventory management methods and their impact on the profitability of Kenyan SMEs using primary data. They found a significant positive association between profitability and different methods of inventory management. Further, they reported that inventory budgeting has more impact on profitability. Sahari et al. (2012) examined the effect of efficient inventory management on firm growth in Malaysian firms using correlation and regression analysis. They found a positive effect of efficient inventory management on firm growth and capital intensity. Imeokparia (2013) examined the effect of different techniques of inventory management on the growth of Nigerian food and beverage firms using the multiple regression method. The results reported a significant positive association between firm growth and inventory techniques.

Lwiki et al. (2013) examined different inventory practices the Kenyan sugar manufacturing firms employed and their impact on firm performance using structured and semi-structured questionnaires. The results show a significant positive association between inventory management and firm performance. Sekeroglu and Altan (2014) examined the relationship between inventory management techniques and firm growth of Turkish firms from different sectors. They found a positive association between the two in one sector, while they found no association between the two in other sample sectors. Munyao et al. (2015) examined the significant role of inventory management techniques in assessing the performance of Kenyan manufacturing firms using descriptive research. They found that the Kenyan firms employed different inventory techniques to manage the inventory. Moreover, the material requirement planning method was used largely compared to other methods.

Mbula et al. (2016) investigated the moderation impact of the political environment between profitability and different practices of inventory management in the venture capital firms funded by the Kenyan government using quantitative analysis. They reported that the Kenyan government-funded firms have optimum inventory management practices. Shin et al. (2016) investigated the impact of effective inventory management on firm profitability in U.S. manufacturing companies. They found that the firms that were maintaining lower levels of inventory experience growth in profits. Using qualitative research, Khalid and Lim (2018) examined the association between organizational performance and inventory management methods in the Malaysian manufacturing sector. They found a positive association between different inventory methods and profitability, and further, they reported that an optimum inventory management policy should positively affect profitability.

Muchaendepi et al. (2019) studied the relationship between inventory management and firm performance in Zimbabwean SMEs using qualitative research. They found that most SMEs used the Just-In-Time inventory technique to manage the inventory. In this regard, SMEs face many challenges related to the supply chain. Further, they also faced problems of customer delays due to a lack of technology. Mbah et al. (2019) investigated the significant association between firms' operational performance and inventory management in Nigerian manufacturing firms. In this regard, they examined different techniques of inventory used by these firms through structured questionnaires. The results reported a significant positive association between the firms' operational performance and different inventory management methods. Chebet and Kitheka (2019) studied the SAP system in inventory management and its impact on firms' profitability. They found that the close and continuous assessment of EOQ shall enhance firms' profitability and recommended using SAP in the management of inventory.

Nguyen et al. (2019) examined the firms' productivity policy and foreign ownership and their effect on the firm

growth of Vietnam firms using multiple regression. They found that an increase by one unit in productivity and foreign ownership enhanced firm growth. Gołaś (2020a) studied the causal relationship between inventory management practices and profitability in the Polish food industry. He found a growth in inventory management efficiency. He reported a significant positive correlation between financial performance and inventory management practices. Gołaś (2020a) analyzed the empirical relationship between profitability and different practices of inventory management of Polish manufacturing firms using panel regression. He found a strong association between inventory management and profitability, and this association is negative and significant with the increase in inventory time.

Adekoya and Olumayokun (2020) studied the effect of inventory management techniques on the performance of Nigerian hospitality firms using longitudinal research. They reported a positive effect of inventory management methods on performance, hence reporting an increase in EPS due to good inventory management practice. Nguyen (2020) studied Vietnam's firms' working capital management policy and its influence on firm growth. The study found that a firm with a larger level of inventories reduces the level of firm profits. Risal and Acharya (2021) analyzed the empirical association between profitability and practices of inventory management in Nepal public companies using a quantitative research method. They reported an insignificant negative association between profitability and different methods of inventory management and suggested managing working capital efficiently. Ajayi et al. (2021) studied the association between effective inventory management methods and firm growth in the Nigerian consumable goods companies using the panel regression method. The study reported an increase in firm growth due to effective inventory management practices, suggesting the same for Nigerian firms. Using pooled regression, Rahman (2021) examined the cash conversion cycle and its influence on firm growth in Saudi Arabian firms. He found a positive association between the two. Using panel regression, Rahman (2021) studied the association between supply chain finance in terms of cash conversion cycle and financial growth. He found a negative association between the two.

The review of the literature examining the nexus between inventory management and firms' financial growth shows that most of the studies examining this effect are found in the western world, while the studies studying this effect are less in number in Saudi Arabia. Further, the market of Saudi Arabia incorporates distinct features compared to its global peers (Shaik, 2021). Therefore, it becomes significant to examine the influence of inventory management on the firms' financial growth. The study hypothesis is as follows.

H1: *There is a nexus between efficient inventory management and firms' financial performance.*

3. Methodology

The current study examines the nexus between inventory management and firms' financial performance of non-financial sample firms listed on Tadawul, which consists of 100 firms from different sectors. The period of study starts in 2016 and ends in 2020. The data used for empirical analysis was obtained from companies' annual reports. To examine the nexus between the two, the study uses Return on Assets (ROA) and Inventory Turnover Ratio (ITR) as a dependent variable alternatively and inventory conversion period (ICP), debt ratio (D.R.), firm growth (F.G.), gross profit (G.P.) as independent variables. Moreover, firm size (F.S.) is included as a control variable.

To examine the nexus between inventory management and firms' financial growth, the study employs pooled regression model by using the above-mentioned dependent and independent variables. The established empirical model is as follows:

$$\mathrm{ROA}_{i,t} = \alpha_0 + \beta_1 \mathrm{ICP}_{i,t} + \beta_2 \mathrm{DR}_{i,t} + \beta_3 \mathrm{FG}_{i,t} + \beta_4 \mathrm{GP}_{i,t} + \beta_5 \mathrm{FS}_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$\mathrm{ITR}_{i,t} = \alpha_0 + \beta_1 \mathrm{ICP}_{i,t} + \beta_2 \mathrm{DR}_{i,t} + \beta_3 \mathrm{FG}_{i,t} + \beta_4 \mathrm{GP}_{i,t} + \beta_5 \mathrm{FS}_{i,t} + \varepsilon_{i,t} \quad (2)$$

where α_0 is the constant in Eq. 1 and 2, β_1 to β_5 are the coefficients of ICP, D.R., F.G., G.P., and F.S. $\varepsilon_{i,t}$ is the model's error term. The robustness and fitness of the study model are tested with the help of Adjusted R^2 and F-test.

4. Results

The current section presents the study results using descriptive statistics, correlation analysis, and pooled regression analysis. Table 1 shows the results of descriptive statistics, such as mean, standard deviation, minimum and maximum.

The descriptive statistics present a mean ROA of 2.91 and a standard deviation of 7.38. Similarly, the mean ITR is 3.94, with a standard deviation of 3.53. The positive values of dependent variables show that the Saudi Arabian companies are good in their operations and maintaining their inventories. The mean ICP of 33.88 is a very high and alarming period, where the companies are unable to dispose of their inventories. The F.G., which is related to sales, is also negative. The firm size is positive, with a mean of 6.27 and a standard deviation of 1017.

Table 2 presents the correlation analysis results. The results show that the independent variable ICP is positively related to ROA and ITR, while the other independent variables are positively and negatively associated with the dependent variables. In addition, firm size is positively related to the dependent variables.

Table 1: Descriptive Statistics

Variables	Obs	Mean	SD	Min	Max
ROA	540	2.91	7.38	–24.82	30.16
ITR	540	3.94	3.53	0.01	18.28
ICP	540	33.88	26.38	0.01	99.65
DR	540	3.61	3.09	0.01	21.79
GP	540	23.49	18.91	–95.37	94.39
FG	540	–0.03	0.28	–1	1.29
FS	540	6.27	1.17	0.01	8.68

Table 2: Correlation Analysis

Variables	ROA	ITR	ICP	DR	GP	FG	FS
ROA	1.000						
ITR	0.169	1.000					
ICP	0.107	0.142	1.000				
DR	0.213	–0.119	0.113	1.000			
GP	0.406	–0.051	0.009	0.165	1.000		
FG	0.202	0.121	0.047	–0.057	0.259	1.000	
FS	0.159	0.242	0.234	–0.024	0.269	0.249	1.000

Table 3 presents the pooled regression results for models one and 2. The reported effects of model 1 show that the inventory conversion period, which is the inventory management measurement variable, is positive and significant at the less than 10% level of significance. The other independent variables, such as debt ratio, firm growth, and gross profit, are positively associated with the ROA at less than a 1% significance level. The firm size is insignificant. The model fitness result shows an adjusted R^2 of 20 percent and an F-statistic of 27.90 significant at less than 1 percent. Moreover, the results of model 2 show that the inventory conversion period is positive and significant at the less than 5 percent level of significance. The other independent variables, such as D.R. and G.P., are negative and significant at less than 5 percent and 1% significance level.

In comparison, F.G. is positive and significant at the 5 percent significance level. The firm size is positive and significant at less than a 1% significance level. The model fitness result shows an adjusted R^2 of 9 percent and an *F*-statistic of 11.46 significant at less than 1 percent.

5. Discussion

The study examines the nexus between inventory management and firms' financial performance. The results mentioned in section 4 show that the inventory conversion period (ICP), the inventory management variable is positive and significant with the financial growth variable, i.e., the ROA. Similarly, the ICP is also positive and significant with inventory turnover, i.e., the ITR. This shows that efficient inventory management has a positive impact on the firms' financial growth. This indicates that there is efficient management of inventory in Saudi Arabian firms. The results of the current study support the past research of Rajeev (2008), Robert Nyamao and Patrick (2012), Sekeroglu and Altan (2014), and Gołaś (2020b). The other explanatory variables, such as debt ratio and gross profit, positively influence the firms' financial growth, while they negatively influence the inventory turnover. Therefore, financial growth is positively related to financial growth and inventory turnover.

Table 3: Empirical Results of Pooled Regression

Model-1: ROA (Dependent Variables)				
	α	***β***	***t*-statistic**	***p*-value**
ICP		0.021	1.89*	0.059
DR		0.368	3.88***	0.000
GP		0.134	8.23***	0.000
FG		2.916	2.72***	0.007
FS		0.162	0.61	0.542
Constant	–3.216		1.96	0.051
Adjusted-R^2	0.20			
F-statistic	27.90***			0.000
Model-2: ITR (Dependent Variables)				
ICP		0.013	2.27**	0.023
DR		–0.114	2.35**	0.019
GP		–0.022	2.65***	0.008
FG		1.057	1.93**	0.054
FS		0.685	5.07***	0.000
Constant	0.168		0.20	0.841
Adjusted-R^2	0.09			
F-statistic	11.46***			0.000

Note: *p-value < 0.1; **p-value < 0.05; ***p-value < 0.001.

6. Conclusion

The study examined the nexus between the inventory and firms' financial growth in the Saudi Arabian companies listed on Tadawul. The data was taken from the firms' financial reports. To empirically analyze the results, the study used pooled regression. The Return on Assets (ROA) and Inventory Turnover Ratio (ITR) were dependent variables. The results show that the inventory management variable, the inventory conversion period (ICP), is positively associated with the firms' financial growth and inventory management. The results suggest that the Saudi Arabian firms maintain an efficient inventory management system. The study supports the hypothesis that there is a nexus between the firms' financial growth and firms' efficient inventory management. The study results are helpful to the production managers of manufacturing companies, firms' policymakers, and stock market investors. The study has some limitations, such as it is limited to Saudi Arabian firms. Future research can address the problem by including the firms of GCC nations in comparison.

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