EXAMINATION OF THE RELATIONSHIP BETWEEN STOCK MANAGEMENT AND PROFITABILITY IN BUSINESSES: AN APPLICATION ON BORSA ISTANBUL MANUFACTURING COMPANIES

İşletmelerde Stok Yönetimi ile Kârlılık İlişkisinin İncelenmesi: BIST İmalat Şirketleri Üzerine Bir Uygulama

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Abstract
This study aims to investigate whether there is a significant relationship between inventory management and the profitability of enterprises operating in the manufacturing sector. The primary purpose of businesses is to maximize firm value. For this purpose, they want to determine the most accurate method to increase profitability by using their assets efficiently. The practical and efficient use of asset stocks with the least liquidity among current assets is thought to affect their profitability positively. The financial ratios of companies in the manufacturing sector traded on the BIST between 2019-2021 have been taken as data, and multiple regression analysis is used as the analysis method. The findings show a significant negative relationship between the stock/current assets ratio and profitability for all three years. A positive relationship is found with the 2019 net sales growth rate and a negative relationship with stock holding time. A positive and significant relationship is found between profitability and net sales rate for 2020. In summary, it can be said that businesses can increase their profitability by reducing their stocks.

Öz
Bu çalışmanın amacı imalat sektöründe faaliyet gösteren işletmelerin stok yönetimi ile karlılıkları arasında anlamlı bir ilişki olup olmadığının araştırılmasıdır. İşletmelerin temel amacı firma değerini maksimize etmektir. Bu hedefler doğrultusunda varlıklarını verimli şekilde kullanmak ve böylece karlılıklarını artırmak için en doğru yöntemi belirlemek isterler. Dönen varlıklar arasında en az likiditeye sahip olan stokların etkin ve verimli kullanımının firma karlılığı üzerinde olumlu yönde etkisi olduğu düşünülmektedir. BİST'te işlem gören imalat sektöründe faaliyet gösteren şirketlerin 2019-2021 yılları arasındaki finansal oranları veri olarak alınmış ve analiz yöntemi olarak çoklu regresyon analizi kullanılmıştır. Elde edilen bulgularda, stok/dönen varlıklar oranı ile karlılık arasında her üç yıl için anlamlı bir negatif ilişki bulunurken, 2019 net satış büyüme oranı ile pozitif, stokta bekleme süresi ile negatif bir ilişki bulunmuştur. 2020 yılı için karlılık ile net satış oranı arasında pozitif ve anlamlı bir ilişki bulunmuştur. Özetle işletmelerin stoklarını azaltarak karlılıklarını artırabilecekleri söylenebilir.

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1. Introduction

With the intense competition conditions, the primary purpose of the enterprises is to maximize the firm's value. One critical sub-component of the value concept is maximizing the firm's profit. Many factors affect profitability in businesses. These factors are much more significant in manufacturing enterprises. From the past to the present, the effective use of the assets of the enterprises can be expressed as an essential factor affecting profitability. Since the current assets of a business can be converted into cash more quickly in the short term, many studies have examined the relationship between profitability and current asset account groups.

In the current asset structure, inventories are minor liquid assets, which can be an essential expense item that can increase the cost, especially for the manufacturing sector. In these respects, the current state of stocks and their weight in current assets have been the subject of many studies affecting profitability. Many institutions and methods meticulously examine inventory management in enterprises have begun to be applied to ensure maximum profit with minimum cost.

There are many cost items related to stocks. These items consist of holding costs, holding costs in stock, ordering costs in order-operated businesses, production costs in self-manufacturing businesses, and fixed costs related to primary storage. The cost of holding and the cost of holding in stock appear as alternative costs to each other. In this respect, the balance between the two cost items is crucial because the problems caused by the lack of a product in stock cause customer losses, while on the other hand, having more than enough products in stock increases the transportation costs, that is, the costs of waiting in stock.

The most commonly used profitability ratio in businesses is the return on assets. The return on assets shows how much profit a business generates using its assets. When assets are classified as current and noncurrent assets, it is seen that current asset items are mostly considered concerning profitability. When we say current asset items, according to the liquidity order, liquid assets, securities, trade receivables, and inventories items and the weights of these items within the group are also heavily evaluated in financial analysis. While excess stocks, which are the least liquid current assets in a business, may increase profitability in the short term and cause long-term liquidity problems. From these perspectives, it can be said that an asset item should be at an optimum level.

This study aims to examine whether there is a relationship between the stock levels of manufacturing enterprises and their profitability, and if there is, what level of this relationship is. Considering the limited number of studies that test the relationship between inventory management and firm profitability for the manufacturing sector, this study contributes to the previous literature by developing policy recommendations. For this purpose, in the first part, the concept of stock and the methods used in stock management; in the second part, the ratios to be used are introduced; and in the third part, the findings of the research part of the study are given.

2. The Concept of Stock and Stock Management

Meeting customer demands is of great importance for continuity and profit maximization. They must have the materials they will use in production and the final products. These materials that businesses hold are called stocks (Atmaca, 2020).

All organizations hold stocks, and stocks differ according to the structure and types of organizations. According to Turkish Accounting Standards (TAS), the concept of stock is "held for sale in the normal course of business, produced for sale or in the form of first materials and materials to be used in the production process or service delivery" (Kilavuz, 2009). Any material kept until needed is called "stock" (Zorlu, 2018).

A. Ertuğrul & G. Arı, Examination of the Relationship between Stock Management and Profitability in Businesses: An Application on Borsa Istanbul Manufacturing Companies

The concept of stock can sometimes appear as a concrete and abstract element (Kurtlu and Gobi, 2020). For example, stocks are tangible in a supermarket or a warehouse with finished products and can be defined very easily. However, when we think of the service sector, the concept of stock appears as an intangible element. The stock of the trainer working in the education sector is information, an abstract concept that is difficult to classify and evaluate.

Although the concepts of stock and inventory are often used interchangeably, there are fundamental differences between them (Aydin, 2018). The concept of inventory is used to describe all the materials in stock. Every inventory item within the business is defined as business inventory, but not every inventory is defined as stock. The reason for this is that in addition to all stocks, all equipment within the enterprise is included in the inventory lists (Yildirim, 2009).

2.1. Reasons for Keeping Stock in Business

Businesses need to keep stock for several reasons. These reasons are tried to be explained below:

Uncertainty factor: Unpredictability of demands in enterprises, possible worker problems, disruptions that may occur in production, delays in loading and transportation, extraordinary weather conditions, and all kinds of malfunctions that may occur in assembly machines. Due to the circumstances, the necessity of keeping stock in order not to disrupt the process in the enterprises arises (Ulker and Arslan, 2020).

Adapting to changing market conditions: Business managers must take some measures to be prepared and cautious against the situational changes that may occur in market conditions (Kizilboga, 2013). For this purpose, businesses have to keep stocks in order not to experience any difficulties in the face of sudden fluctuations in the prices of the products they need.

Desire to benefit from quantity discount: Suppliers often apply discounts to customers who purchase large quantities of products. Businesses that want to take advantage of this discount application can reduce the number of orders and ownership costs by increasing the number of orders. As a natural result of this situation, the number of stocks in the enterprise increased (Kizilboga, 2013).

Firm Prestige: In case of stocks below a certain level in enterprises, customer losses may occur. In particular, the dissatisfaction of the customers, that is, the inability to respond to customer demands negatively affects the prestige of the companies. As a result, the profitability of the processing decreases. In order to avoid this situation, businesses keep a certain level of stock (Dadzie and Winston, 2007).

2.2. Inventory Costs

One of the most critical objectives of enterprises is to minimize the costs of the stocks they hold while ensuring that the stock value is maximized (Jung et al., 2008). This issue has become even more critical for businesses, especially in recent years when competition is intense, because raw materials, semi-finished products, and finished goods stocks are among the essential cost items in businesses (Mutlu, 2015). For many years, businesses that have worked with high stocks do not experience any production disruption and meet customer demands on time. However, it is also supported by many studies that high stock amounts are an important factor that increases costs in businesses (Brennan and Copeland, 1988). Inventory costs in businesses are generally classified as follows in the literature:

Purchasing Costs: The costs incurred for purchasing all kinds of raw materials, semi-finished products and products ready for direct sale constitute the costs. Taxes, transportation costs, insurance, etc., incurred during the purchase of products are considered within the scope of purchasing costs (Abel et al., 2013). When it comes to benefiting from quantity discounts due to the increase in the order quantity, the purchasing costs decrease, but as a result, the holding cost increases. In this respect, the economic order quantity model, which will be briefly mentioned later, determines the optimum order quantities and tries to minimize the total costs in this way (Arrow et al., 1951).

Ordering Costs: While some businesses can produce raw materials and semi-finished products themselves, some businesses procure products from their suppliers by ordering (Kazak, 2016). For manufacturing enterprises, this cost can be expressed as preparation costs (Ulker and Iskender, 2005). In businesses, placing an order is a fixed cost, independent of the order quantity. From this point of view, when the number of orders placed at once increases, the number of orders decreases, and as a result, the ordering cost decreases. However, there is an increase in another cost item here. As the order quantity increases, there is an increase in the transportation cost, also known as the holding cost. When considering cost balance, it becomes clear that the order should be placed at the optimum level, ensuring the balance of the two expense items.

Stock-Keeping (Transportation) Costs: The cost of keeping a unit of an item in stock for a certain period is called the holding cost (Wang et al., 2010). One of the highest costs we encounter here is the alternative cost. When every product waiting in stock is considered money tied to stock, the opportunity to use money in other rentable areas is missed (Park and Simpson, 2005). Apart from this, other costs encountered, such as storage, the cost of particular areas required for the transportation and storage of products, theft of inventory items, and tax expenses related to inventory items, are among the costs of holding.

Stockout Cost: Stockout cost can be defined as the cost that occurs in the form of not meeting the current demand/demands, and that occurs in the time elapsed until it is supplied in the process (Kowalski, 1991). Stockout costs can be considered a decrease in revenues due to the loss of customer confidence and loss of customers. However, the numerical calculation of stockout costs is complicated and far from objective. Stockout situations result in customer losses and sales losses due to the inability to meet customer orders on time. On the other hand, in companies that produce themselves, the inability to meet the domestic demand on time causes the production process to be interrupted or stopped altogether, causing the production not to be made (Arreola-Risa and Keblis, 2013).

3. Financial Analysis and Financial Ratios

Businesses make financial analyses for many reasons. These reasons are explained by classifying them under headings. In this section, the ratios used to measure financial performance are examined.

3.1. Reasons for Performing Financial Analysis

Presenting a Report to the Management: Businesses perform financial analysis to see their place in the sector they operate and make plans for their future. Transactions use many ratios to see their profitability, whether they can use their assets effectively, leverage structure, and liquidity status. The ratios used are used to determine future provisions using past data, thus identifying and solving existing problems (Lee et al., 2009). For example, if the stock turnover rate of the enterprise is lower than other companies in the sector in previous years, solutions can be produced by changing the applied policies. The financial analysis made to present a report to the management of the enterprises can also be described as an internal analysis. Internal analysis can be defined as the analysis made by the people operating in the business (Arabaci and Cavdar, 2009).

For Investment Purpose: Investment analysis in enterprises can be expressed as an external analysis. External analysis is the analysis made by people or organizations outside the business to see the business's financial status (Koseoglu, 2019). Investors who will invest in the business by purchasing stocks and/or corporate bonds or financing bills, mainly publicly traded businesses, subject the business to financial analysis. The points considered are the business's growth potential, profitability, liquidity and indebtedness (Baydas, 2020).

Credit Analysis: It can be defined as an external analysis made when businesses want to outsource (Altunkilic, 2019). Institutions that provide financing to enterprises subject said enterprises to detailed financial analysis to respond to the financing demand. In the credit analysis, which banks generally make, the financial leverage structures, interest coverage strength, liquidity status and operating efficiency ratios of the enterprises are examined in detail, and the loan demand is evaluated (Destereci, 2009). The purpose here is to examine whether the given debt can be paid on time with the help of data.

3.2. Financial Ratios used in Inventory Management and Profitability Relationship Analysis

There are many ratios used for financial analysis in businesses. These rates are; liquidity ratios, activity efficiency ratios, financial situation ratios, and profitability ratios grouped under four headings (Iskenderoglu et al., 2015). The ratios analyzed in this study are briefly explained, and the ratios not used in the analysis are not included. Profitability and operating efficiency ratios to be used in examining the relationship between inventory management and profitability are defined below.

The profitability ratios used in businesses are grouped into two categories: the profitability ratios obtained from the balance sheet and the profitability ratios created using the income statement data. In this study, the profitability ratio obtained from one balance sheet is used according to the data obtained from the literature study.

Return on Assets (ROA): It is a crucial ratio defined as businesses using their current and fixed assets effectively and efficiently and turning them into profits. The return on assets ratio, which is calculated as Net Profit/Total Assets, has been used as a profitability criterion in many studies in the literature (Ertugrul Ayranci, 2019).

The operational efficiency ratios used in businesses can be analyzed by calculating receivables turnover, inventory turnover, average activity period, and current asset turnover (Saldanli, 2012). Since the rates used in the study are for the effective use of stocks, the expansions and definitions of the rates to be used are explained below.

Stock Turnover Rate: As mentioned before, effective and efficient use of stocks is critical in businesses. The inventory turnover ratio is calculated as the Cost of Goods Sold / Average Stocks (Ozolgun, 2017). The higher the stock turnover rate in the enterprises, the higher the meltdown of stocks and their conversion into cash. Businesses increase their opportunity costs due to the decrease in inventory turnover. The money tied to the inventory is thought to be high.

Average Waiting Time in Stock: Waiting time works inversely with the stock turnover rate. The higher the inventory turnover rate, the lower the waiting inventory time is. When the waiting period in stock is evaluated as 365 days in a year, it is calculated as 365 / Stock Turnover Rate (Dincergok, 2019). The longer the products are kept in stock, the longer the cash conversion cycle increases, so the low rate indicates that it increases liquidity in the studies.

Stocks / Current Assets Ratio: The assets with the lowest liquidity among current assets are stocks. A low or high ratio can be interpreted as both good and bad. If the ratio is high, it indicates that the business holds more stock than necessary, and as a result of this, the holding cost decreases. In contrast, a low ratio indicates that the holding (carrying) costs decrease by increasing the liquidity (Kiraci, 2009).

Net Sales Increase Rate: In enterprises, net sales revenues are significant for profit maximization. In this respect, the increase in sales in the enterprises reduces the costs by reducing the stocks and thus increases the profitability (Saygili and Sahin, 2018). The higher the increase rate of the net sales of the enterprises, the less the weight of the stocks in the current assets is expected to decrease.

3.3. Literature Review

Richard and Parrish (1986) analyze the relationship between the stock turnover rates of the US companies registered in the Chamber of Pharmacists and the gross return on investments and profitability. They use correlation and regression methods as analysis methods in their studies. Using net profit as an indicator of profitability, the authors find a significant positive relationship between the gross return on investments and net profit. Their study finds that stock turnover and gross return rate significantly affect profitability.

Shin and Soenen (1998) examine the relationship between profitability and net working capital in their study and for this, they study US businesses between 1975-1994. While their studies use operating profitability and asset profitability ratios, current, leverage, and sales growth rates are also used as working capital indicators. The authors use correlation analysis to analyze whether profitability increases with the improvement of net working capital.

In their study, Kinney and Wempe (2002) analyze the financial performance of 201 businesses using the Full-Time Production System. Return on assets is taken into account as a financial performance measurement criterion. In their findings, it has been determined that the profitability of the enterprises using the full-time production system has increased.

In the study, Deloof (2003) examines the relationship between working capital and profitability of companies operating in sectors other than the financial system in 1009 Belgium. The study aims to conclude whether the profitability of enterprises with good working capital is positively affected or not. Variables such as receivable collection period, average waiting time in stock, stock policy, and commercial debt payment period are used as data. As the profitability variable, the return on assets is evaluated. As a result of the findings, it is found that profitability increases with the decrease in the receivable collection period and the waiting times in the stock.

Sayaduzzaman (2006) examines the relationship between working capital management and profitability by using the financial ratios of a Bangladesh business operating from 1999-2003. While using the variables, such as receivable turnover, stock turnover, receivable collection period, etc., to test the efficiency of working capital, he takes into account the return on assets, gross profit margin, and net profit margin ratios in order to determine profitability. He finds that stock turnover has a negative relationship with profitability, but this is not statistically significant.

In their study, Truel and Martinez (2007) use the financial data of 1996-2002 of 8872 companies operating on the Spanish Stock Exchange to analyze profitability, receivables turnover, inventory turnover, and leverage ratio. They analyze the relations of the ratios by using the regression analysis method. Their findings show that return on assets, leverage ratio, and growth significantly affect working capital.

Koumanakos (2008) examines the relationship between stock management and operating profitability. The author takes the financial data of the manufacturing enterprises operating in Greece from 2000-2002 and uses regression analysis. As a result of the analysis, the author finds that the increase in stocks affects sales revenues negatively. As a result, he concludes that good stock management positively affects business performance.

In his study, Kiraci (2009) uses the financial data of the companies operating in the manufacturing sector registered in the BIST for 2002-2006 and applied regression and correlation analyses as the analysis method. According to the results, he finds a positive relationship between stock turnover and asset profitability, and net profit rates. In contrast, a negative relationship between stock turnover and gross profit ratio is found. At the same time, he determines a negative relationship between the ratios of stocks to total assets and current assets and profitability ratios.

Nobanee and Al Hajjar (2009) examine the relationship between working capital and profitability using the financial data of 2123 enterprises operating in Japan from 1990-2004. In their results, they found that profitability increases with the increase in the stock turnover and receivables turnover and the extension of the maturity of the debts.

Gill et al. (2010) examine the relationship between working capital and profitability. They found that the gross profit margin decreases with the increase in the receivable collection period, and the profitability increases with the shortening of the cash conversion period.

Alipour (2011) tests the relationship between working capital efficiency and profitability of 1063 enterprises traded on the Tehran Stock Exchange from 2001-2006 with regression and correlation analysis. As a result of his findings, although he finds a negative relationship between

stock turnover and profitability, he finds that the efficiency of working capital is an essential factor that increases profitability.

Akbulut (2011) examines the relationship between working capital and operating profit. In this study, the manufacturing companies operating on Borsa İstanbul between 2000-2008 are taken as data. A negative relationship is found between the cash conversion cycle and the return on assets.

Cakir and Kucukkaplan examine the relationship between working capital and profitability by using the financial ratios of 122 manufacturing enterprises traded in the BIST in 2012, for the years 2000-2009. The authors who preferred the panel regression method for analysis used many ratios. These rates are; the current ratio, acid test ratio, cash ratio, receivables turnover, asset turnover, and asset and equity profitability ratios. In the results obtained, they found that the acid test ratio, the liquidity ratio, the stock turnover ratio, and, the asset turnover ratio, the operating efficiency ratio, have a positive relationship with profitability.

Agha (2014) tests the relationship between working capital and profitability of pharmaceutical companies traded on the Pakistan Stock Exchange between 1996 and 2011. He uses regression and correlation analysis to find a negative relationship between business profitability, receivables turnover, and stock turnover ratios.

Enqvist et al. (2014) determine the relationship between profitability and working capital, and they conclude that there is a negative relationship between the variables of stock turnover, average receivables collection period, payment period of debts, and return on assets, and gross profit margin.

Saglam and Karaca (2015) examine the relationship between working capital management and profitability using the financial data of 17 textile companies traded in BIST between 2000 and 2012. Using stock turnover, asset turnover, cash ratio, acid test ratio, and current ratio as working capital data, the authors find that the variables that have a positive effect on profitability are stock turnover, asset turnover, receivables turnover, acid test ratio, and cash ratio. At the same time, the authors conclude that the increase in total debt negatively affects profitability.

In his study, Ayub (2015) uses the data from 138 textile enterprises traded on the Karachi Stock Exchange from 1999-2007 and examines the relationship between working capital and profitability. The author, who used multiple regression analysis as an analysis method in his study, finds a significant positive relationship between net operating profit margin and gross working capital turnover.

Yildiz and Akkoc try to determine the relationship between working capital and profitability by using the 2000-2013 financial ratios of 2312 observation data traded in BIST in 2016. The neural fuzzy inference system method is used as the analysis method. Their findings conclude that there is no linear relationship between profitability and working capital.

Aygun et al. (2018) examine the relationship between stock management and the financial performance of businesses by using the 2016 financial data of 249 businesses operating in different fields other than the financial sector traded in BIST. In the study, regression and correlation analysis are performed, and they conclude that the profitability decreased with the increase in the financial leverage ratio. However, there is a positive relationship between stocks and profitability.

In their study, Ulker and Arslan (2020) examine the relationship between stock management and profitability by using the data of 140 companies operating in the manufacturing sector in BIST for the years 2013-2018. Using correlation and regression as analysis methods, the authors conclude a positive relationship between stock turnover and return on assets and between return on equity and stock turnover.

Kisakurek and Erdogan (2021) use the data of 101 companies in the manufacturing sector traded in BIST from 2005-2017. In their studies, the authors who wanted to determine the relationship between stock management and profitability used regression and correlation analysis. Considering the ratios they use, stock turnover ratio, stock to assets ratio, stock to net working capital ratio, net profit ratio, stock to current assets ratio, stock growth rates, and relative to profitability, gross profit margin, net profit margin, return on assets, return on equity rates are used. As a result of the study, they find that there is a negative relationship between stock turnover and gross sales profit rate.

4. Research

4.1. Purpose and Importance of the Research

This research investigates whether there is a relationship between stock management and the profitability of enterprises. For this purpose, it is revealed whether the profitability of the enterprises is affected by the stock management policies and whether their profitability increases with the effective and efficient management of the stock management policies. Considering that the most fundamental purpose in enterprises is sustainability and value maximization, this aim can be supported by applying a valid management policy in stocks to increase profitability. In this respect, determining the relationship between stock management and profitability is vital in guiding businesses and new studies.

4.2. Data Set and Method of the Research

The research covers 194 manufacturing companies traded on the Borsa Istanbul (BIST) from 2019–2021. The sample period is intentionally short to observe the effect of the pandemic period. Firms whose data could not be reached in the mentioned years were not included in the analysis. Multiple regression analysis is applied as a research method; thus, the variables that affect the profitability the most and their degree of impact are determined. Due to the short data timeframe, the study preferred multiple linear regression analysis instead of panel regression analysis. The dependent and independent variables included in the study are indicated in Table 1.

Table 1. Dependent and Independent Variables Related to Inventory Management and Their Codes

Variables	Calculation Method	Code
Dependent Variable		
Return on Asset	Net income$_t$/Total asset$_t$	ROA
Independent Variables		
Stock Turnover Rate	Cost of goods sold$_t$/Average stock$_t$	STR
Waiting Time in Stock	365/Stock turnover rate$_t$	WTIS
Net Sales Increase Rate	(Net sales$_t$-Net sales$_{t-1}$)/Net sales$_{t-1}$	NSIR
Stock / Current Asset Rate	Total stock$_t$/Total Current Asset$_t$	SCAR

The financial ratios in Table 1 are the ratios obtained from the literature review. The financial ratios of the enterprises are taken from FINNET, and the SPSS 24 package program is used in the analysis.

The descriptive statistics for the variables are presented in Table 2, separately for each period. The average return on assets of the manufacturing companies included in the sample in 2019 is 4.47. This value increased to an average of 10.99 in 2021. The average net sales rate has steadily increased throughout the research period. There is a decrease in average waiting time in stock as comes to 2021. The rate of stock to current assets has been around approximate values on average over the three years. In 2021, the average stock-to-current assets rate was 32.30, and the maximum value was 91.81.

Table 2. Descriptive Statistics

Variables	Obs.	Mean	Median	Std. Dev.	Min.	Max.
Panel A: 2019						
Return on Asset- ROA	194	4.475	3.355	10.562	-41.590	48.295
Stock Turnover Rate - STR	194	8.183	4.114	32.783	0.000	450.481
Waiting Time in Stock - WTIS	194	893.89	87.659	10,877.70	0.000	151,614.3
Net Sales Increase Rate - NSIR	194	16.738	8.840	77.147	-86.859	995.667
Stock/Current Asset Rate - SCAR	194	32.940	30.371	16.489	0.000	88.142
Panel B: 2020						
Return on Asset- ROA	194	7.502	5.775	14.985	-77.519	136.481
Stock Turnover Rate - STR	194	7.003	4.013	20.361	0.000	262.470
Waiting Time in Stock - WTIS	194	127.148	88.227	195.362	0,000	2,157.945
Net Sales Increase Rate - NSIR	194	41.489	21.900	166.361	-45.478	1,922.295
Stock/Current Asset Rate - SCAR	194	30.160	28.340	15.126	0.000	81.030
Panel C: 2021						
Return on Asset- ROA	194	10.998	10.054	16.489	-65.567	72.141
Stock Turnover Rate - STR	194	15.973	4.250	102.746	0.000	1,140.164
Waiting Time in Stock - WTIS	194	113.701	85.501	195.362	0.000	1,303.258
Net Sales Increase Rate - NSIR	194	78.095	63.517	117.162	-46.926	1,582.131
Stock/Current Asset Rate - SCAR	194	32.307	31.180	14.646	0.000	91.808

4.3. Research Hypotheses, Findings, and Comments

As mentioned before, multiple regression analyses are used in the study. The regression analysis assumptions are made separately for each model, and the findings obtained based on years are presented in a table for a clear explanation. For the regression application, every three years has been examined separately. In this way, it is possible to examine the relationship between stock management and profitability by years.

The independent variables affecting the return on assets from the data of 194 companies in 2019 are subjected to regression analysis. First, the basic assumptions of the regression analysis are tested, and the model equation is established after the assumption tests.

H_0: There is no significant relationship between ROA and stock management variables.

H_1: There is a significant relationship between ROA and stock management variables.

Before performing the regression analysis, the Kolmogorov-Smirnov normality test is applied, and the H_0 hypothesis is not rejected, which supports that the normality assumption is provided for the dependent variable return on assets for each independent variable.

Table 3. Results of Regression Analysis for the Dependent Variable of Return on Assets for 2019

Constant	Parameters	p value	VIF
	7.686	**0.000**	
Waiting Time in Stock- WTIS	0.122	0.036	1.096
Stock Turnover-STO	-0.026	0.646	1.061
Net Sales Increase Rate- NSIR	0.255	0.000	1.026
Stock / Current Asset Rate - SCAR	-0.171	0.004	1.107
F: 28.254			
p: 0.000			
R-square: 0.430			
Durbin Watson: 1.926			

Model equation:

$$Return\ on\ Assets= 7.686+ 0.122*Waiting\ Time\ in\ Stock+ 0.255* Net\ Sales \\ Increase\ Rate- 0.171*Stock/Current\ Assets \tag{1}$$

In order to interpret the model, first of all, assumptions must be provided. The assumption of normality, one of the assumptions, is provided, and then we test whether there is a multicollinearity problem. When the VIF values for the model are examined, it is seen that there is no multicollinearity problem, as the VIF values are below the critical value of 10. Another assumption is that there is no autocorrelation. When we look at the Durbin-Watson value, it can be said that the value of 1.926 indicates no autocorrelation problem (du≤1.926<4-du; du:1.81). Another assumption that must be provided for the model is the covariance assumption. In order to test the covariance, the spearman rank correlation test is applied, and the H_0 hypothesis, which advocates the existence of covariance, is not rejected at the 5% significance level (pwtis = 0.405; psto =0.527; pnsir =0.629; psca =0.089). Thus, all assumptions are provided, and the model equation is established. When the significance of the model is tested, it is found to be significant at the 5% significance level (p=0.000< 0.05). The R-square value of the independent variables, which gives the explanatory power of the dependent variable, is found to be 43%, and it can be interpreted as low explanatory power. When the model equation is examined, while it is seen that there is a positive relationship between the stock holding time and the rate of increase in net sales and profitability, there is a negative relationship between the ratio of stocks to current assets. When the model is examined, it is seen that the variable that affects profitability the most is the increase rate in net sales. In contrast, the variable with the lowest impact power is the waiting time in the stock.

Table 4. Results of Regression Analysis for the Dependent Variable of Return on Assets for 2020

Constant	Parameters	p value	VIF
	11.243	**0.000**	
Waiting Time in Stock- WTIS	-0.012	0.862	1.405
Stock Turnover-STO	-0.082	0.170	1.079
Net Sales Increase Rate- NSIR	0.572	0.000	1.045
Stock / Current Asset Rate - SCAR	-0.179	0.011	1.478
F: 28.654			
p: 0.000			
R-square: 0.378			
Durbin Watson: 1.857			

Model equation:

$$Return\ on\ Assets = 11.243 + 0.572*Net\ Sales\ Increase\ Rate - 0.179*Stock/CurrentAssets \tag{2}$$

In Table 4, the regression analysis results of the enterprises for the year 2020 are written. When Table 4 is examined, it is seen that the coefficients of the variables of stock turnover and waiting time in stock are insignificant at the 5% significance level (pwtıs= 0.862>0.05; psto=0.170>0.05). Since the model assumptions have been explained in detail, they are stated more briefly here. Assumptions are tested for 2020 and all assumptions are found to be met (VIF values less than 10; du≤1.857<4-du; du:1.81; pnsir = 0.183; pscar =0.059).

When the model equation is examined, it is seen that the dependent variable of return on assets in 2020 is affected by the net sales increase rate and the stock/current asset ratio. While it is seen that there is a positive relationship between profitability and net sales increase rate, it has been found that there is a negative relationship between total stock/current assets. It has been observed that the variable that affects profitability the most for 2020 is the rate of increase in net sales. At the same time, the net sales increase rate and the total stock/current assets explain 37.8% of the return on assets. The unexplained part arises from the variables not included in the other model.

Table 5. Results of Regression Analysis for the Dependent Variable of Return on Assets for 2021

Constant	Parameters	p value	VIF
	18.914	0.000	
Waiting Time in Stock- WTIS	-0.047	0.545	1.405
Stock Turnover-STO	0.034	0.641	1.079
Net Sales Increase Rate- NSIR	0.020	0.774	1.045
Stock / Current Asset Rate - SCAR	-0.206	0.010	1.478
F: 2.935			
p: 0.022			
R-square: 0.058			
Durbin Watson: 1.993			

Model equation:

$$Return\ on\ Assets = 18.914 - 0.206*Stock/CurrentAssets \tag{3}$$

In Table 5, the regression analysis results of the companies for 2021 are written. When Table 5 is examined, it is seen that the coefficients of the variables of stock turnover, waiting time in stock, and increase in net sales are insignificant at the 5% significance level (pwtis= 0.545>0.05; psto=0.641>0.05; pnsir=0.774>0.05). Assumptions are tested for 2021, and all assumptions are found to be satisfied (VIF values are less than 10; du≤1.993<4-du; du:1.81; pscar =0.871>0.05).

When the model equation is examined, it is seen that the dependent variable of return on assets in 2021 is only affected by the stock/current assets ratio, and it has been found that there is a negative relationship between the total stock/current assets. The total stock/current assets explain 5.8% of the return on assets. Although the explanatory power is relatively low, it is seen that the model as a whole is significant (F=2.934; p= 0.022<0.05).

5. Conclusion, Comments and Suggestions

In line with the goal of value maximization, a concrete concept, businesses may adopt maximizing their profits as a goal, in addition to all other goals, to increase the firm's value. Since stocks are the asset group with the lowest liquidity among current assets in businesses, the high amount of money tied to stocks can be considered a factor that may reduce their profitability. In this respect, it is thought that good management of stocks could be an essential factor that would increase profitability. Within the scope of the study, the data of manufacturing enterprises traded in BIST for 2019-2021 are analyzed with the help of the regression analysis method. As mentioned before, the pre-pandemic period data are excluded from the analysis, and the last three years are evaluated. The results show that the return on assets is affected by the ratio of stocks to current assets in all three years. The result that the increase in the total stocks/current assets ratio decreases the profitability follows Kiraci (2009) 's study. In the study conducted for the year 2019, it was found that the variable that negatively affects the return on assets is the stock/current asset total variable, while the variables that affect it positively are the rate of increase in net sales and the waiting period in stock. Again in the same year, it is seen that the variable that affects profitability the most is the rate of increase in net sales. It is not surprising that with the increase in net sales of enterprises, profitability also increases. An important conclusion that can be drawn from this is that by increasing net sales, the products kept in stock decrease, and the money tied to the stock decreases. It has been observed that the variables affecting profitability in 2020 are the net sales rate and the waiting time in stock. While the relationship between the stock/current asset ratio and profitability is negative, similar to the studies of Shin and Soenen (1998), and Deloof (2003), it is seen that there is a positive and significant relationship between the rate of increase in net sales and profitability.

Considering the pandemic conditions, it is typical for the study's findings to give different results in 2019-2020 and 2021. The negative relationship between profitability and the increase in the share of stocks in current assets, which has a significant relationship for each period, was an expected result. Because the asset with the least liquidity in businesses is the stocks, when the money tied to the stocks has a high weight in the current asset, the liquidity will decrease, and the idle money in the hands of the enterprise cannot be converted into productive investments. For these reasons, it is seen that businesses can increase their profitability by reducing the money they attach to stocks. With an appropriate stock management policy, businesses can eliminate customer losses due to out-of-stock and transportation costs due to keeping too many products in stock and thus increase profitability.

In the later stages of the study, analyses can be made by adding variables such as receivables turnover rate, liquid value ratio, current ratio, and acid test ratio from working capital variables to the model and taking the years before and after the pandemic separately. In this way, the model can be expanded by seeing the degree of influence and power of other variables that affect the inventory policies of the enterprises.

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