A STUDY ON RELATIONSHIP BETWEEN INVENTORY LEVEL AND SALES QUANTITY AND AN APPLICATION FROM SPORTSWEAR-RETAILING INDUSTRY

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INTRODUCTION

Businesses of all kinds and scope need customers and achieving their goals of growth is possible, only as long as they efficiently respond to customer needs and keep their customers satisfied. Assuming that the main purpose of a commercial enterprise is creating sustainable profit,then,sustainable profitability is thought to be related to a stable customer structure.Since profitability margins are increasingly being reduced in today's competitive conditions, businesses should re-evaluate their cost structures and related cost items in order to sustain their profits and assets and eventually, to improve them.

Depending on the above-mentioned evaluation, it is necessary to create customer

continuity by maintaining customer satisfaction in order to maintain profitability, while at the same time, reductionary approaches in some cost items are required. Thus, the problem that leads to this study is to present a method that provides both customer loyalty and cost reduction at the same time.

Cost Management is a complicated discipline and venue ,so determining which costs can be linked to customer loyalty is the starting point in the study. As well known, there are a wide range of costs faced by firms: investment costs, operating costs, operation costs, personnel costs, stock costs, quality costs, finance costs, etc. As it is directly related to customer demand, inventories and inventory costs are selected as the major point of interest of the study. Furthermore, inventory costs constitute a very important item for many businesses .

The goods that a retailer holds to be sold to customers are called "stocks"and,or "inventory" . The inventories which can be kept in a production facility are composed of raw materials, semi-finished products, finished products, ready-made parts and auxiliary materials. Stocks are measured by the amount of goods held by the retailer in the aisles for a certain period of time and by their monetary cost. Retail businesses can only achieve their objectives by supplying the appropriate amount of products and meeting the consumer needs,in a timely manner. Keeping a large amount of stock, product width and profitability, as well as a small amount of stock holding, also affect sales and customer retention.

Retail stock management is the planning, implementation and control of activities such as placing orders to ensure profitability with appropriate product range, transportation, storage, presentation on shelf and sales costs.

In a retail business, it is possible to see the distribution of inventories within the activities by looking at the structure of stocks, the dynamics of sales and supply. Inventory management involves a certain level of risk and may vary depending on the nature of the distribution channel in which the firm is located. Main success factors related to inventory management are to be named as; the length / shortness of the supply time, the type of product to be stocked and the depth of the product to be stocked. Not only for retail businesses, but also for other businesses, stock-related decisions is a risk factor in the long run. Stock decisions in manufacturing enterprises are directly related to raw materials,

intermediates, business processes and final products, while in retailers only with products to be sold to final consumers. İn a relative manner, it can be said that the stock risk in retail enterprises is lower than production enterprises.

The retail business applies inventory management by keeping the product in warehouses and shelves in accordance to the consumer demand. Manufacturers benefit from wholesalers' and retailers' input to take decisions in relation to stocks management. Wholesalers buy large quantities of products and sell them to smaller retailers. Wholesalers are capable of supplying different quantities of products from different manufacturers to retailers. In the case of periodicity of product sales, wholesalers and retailers as distribution channel members increase the amount of stock for the period they expect to be intense. As the variety / quantity increased, the product depth and time risk may also rise for the retailer. Effective inventory management for a retailer is related to the "speed of trading". Stock transfer rate for retailer; annual sales amount / value is measured by the ratio of the average stock amount / value. The inventory turnover ratio also shows how many times the retailer stocks have been re-newed within the period. A possible fact that the inventory turnover ratio increases compared to the previous periods and is above the sector average indicates the retailer's competitiveness. The retailer with a high stock turnover rate quickly converts its stock into cash. It can carry out its activities with high liquidity. The cost of holding stock of a retailer with low inventory turnover increases. We can talk about some elements that should be considered in relation to the inventory turnover ratio. The inventory turnover ratio for each product must be calculated,in a systematic manner.

The possible causes of changes in the inventory turnover rate should be determined and necessary arrangements should be made. The inventory turnover rates of products with seasonal fluctuation should also be taken in consideration. The stock management decision is made in an average-sized market with more than 30,000 products. This rate is made in a discount store with more than 25,000 products, while in large markets this figure reaches to the 50,000. Retailers are pressuring manufacturers and wholesalers to asssume more responsibility and contribution in their efforts to reduce stocks risks along with the increasing product range. In this study, the relationship between the increase in stocks and the sales are examined.

CHAPTER 1

1. GENERAL CONCEPTS OF STOCK DEFINITION AND STOCK

1.1. Inventory Management

As we all know, people want to constantly improve and acquire new knowledge as one of their basic needs. Every second the human brain is exposed to new messages. Due to the constant change of needs, the message sent to the brain is undergoing a change. Every new data learned causes the previous one to lose value. Thanks to these new acquisitions, perhaps people make a lot of decisions that can change their lives. The information transmitted to the brain is stored in a depot there, and those that are worthless are forgotten and deleted. Newly acquired information saves them from time to time when they arrive, while information that is forgotten and worthless is often left in a difficult situation. If we consider this situation for an enterprise, it will cost extra to operate as long as the stores are kept in depot history or no longer demanded. However, if we follow the innovations and respond to customer orders in a timely manner and have stock according to the students who are planned in the warehouse, it means that the costs decrease and profit increases.

Today, with the rapid development of technology, consumer preferences are changing rapidly. Large-scale enterprises and small and medium-sized enterprises will want to respond to consumer needs as soon as possible in global economic conditions. In such an environment where there is such competition, businesses need a stocks management system that can reduce profits by reducing costs. So, what is inventory and how should it be managed?

One of the general definitions in this regard is “stockpiling”; measures taken against the pauses in the production process, as well as, waiting for a certain period of time in the presence of uncertainties in demand during the final product phase. In other words, it is all values that have not been sold yet, or are ready for production and can be turned into cash at any time. (Kaya, 2004: 4)

Inventory as an asset on the balance sheet of companies has taken on increased importance because many companies are applying the strategy of reducing their investment in fixed assets, like plants, warehouses, equipment and machinery, and so on, which even

highlights the significance of reducing inventory (Coyle et al., 2003).

Inventory according to the definition of SME; all physical entities and products that participate directly or indirectly in the production of a product in a production system can be considered in the concept of stock. According to another definition; every stored value is considered stock. Stocks are measured in terms of the amount of assets or monetary value. (Kobu, 2008: 327)

Stocks is the amount of finished goods, raw materials and intermediate goods that a firm has at hand at any time in order to meet the sudden needs that may arise and to maintain the production without interruption. (Seyidoğlu, 1992: 794-795)

The concept of stock, which is defined differently in commercial and industrial enterprises, varies according to the sectors and characteristics of the enterprises. In terms of industrial enterprises, stock is the amount of finished goods, materials, raw materials and semi-finished products that are kept at hand any time in order to meet the sudden needs that the companies can put forth and to ensure that the production can be continued without interruption. In terms of commercial enterprises; is defined as the amount in a specific date of goods held for sale. (Kaya, 2004: 4-5)

Inventories vary and depend on the type and size of the business. While stocks of industrial enterprises are composed of raw materials and materials, semi-finished goods and finished goods, stocks of commercial enterprises usually consist of commercial goods which are directly traded. (Kaya, 2004: 4)

Stocks is the precondition that businesses have taken against uncertainties. However, building stocks ,by it's own virtue, is never regarded as the absolute goal. Inventories should be reduced even if they can not be destroyed. Stocks has two functional reasons for existence:

- Demand unknown
- Inefficiencies in the system.

Inventory is the subject matter since the demanded quantity is the quantity supplied, or in other words, the order quantity is not fully equivalent to the quantity of supply. (Küçük, 2011: 22-23)

A general definition can be reached in the light of the above definitions; it is imperative to produce or provide services for the continuation of the operation as well as meeting customer requirements on time. This flow can be called as "continuous accumulation" and any accumulation of stock made to gain.

Businesses will need a stock management system to determine the level of inventory, the time of storage, the level of inventory held for exceptional cases, and the problem with which supplier should be studied.

Stocks Management; aims to determine the most economical amount of stock according to the structure of the business by taking into account the production, sales and financial conditions of the business and to keep this amount at the same level. Stocks movements are continuously checked by inventory management. These control systems are reviewed in the following sections. The important point in stock management is to provide the best service against the smallest stock investment. For the best level of service, the stock management and inventory planning is required to reduce the probability of stagnation to the smallest and to maximize the profit of the business. (Tekin, 2009: 2-3)

As a result, it can be said that the companies aim to determine the optimal stock - order quantity for the business by ensuring that the desired products in the production and marketing process are prepared in the required quantity and on time in relation to the stocks management system.

1.2. Classification of Inventory

Among the assets included in stocks; breed, value, place of use, stocking pattern. It would be appropriate to examine them properly by classifying them appropriately:

a-) Raw Materials: All assets entered into and processed on the business are raw materials. The definition of raw material varies depending on the operation. For example, in an iron and steel factory, iron sprouts are raw materials, made of pig iron. However, in a plant that manufactures radiator radiators, pig raw material, radiator slices are manufactured.

b-) Semi-finished Goods: The transactions that must be carried out are the assets held in the intermediate warehouses between the unfinished work stations. Their semi-finished quality is turned into a finished product ,after a while.

c-) Products: All of the transactions that have to be done within the factory are entities which are placed in the warehouse to be delivered to the customers after they are completed. The products do not show much difficulty in terms of counting, evaluation and control as they have completed a certain stage and stopped in a certain place. Controls are made more difficult because of the high uncertainty in raw materials and semi-finished products.

d-) Pre-fabricated Items: those that form part of the product and are generally procured from the outside. These can be simple yet widely used parts such as bolts, nuts, or complex units added to products such as electric motors, gearboxes, generators.

e) Auxiliary Materials: Repair parts, cutting fluid, machine oil and similar materials that are not used or not used directly in the product. (Kobu, 2008: 328)

1.3. The Importance of Inventory Management

Stocks are an inevitable factor for the uninterrupted and continuous flow of work. It is able to accurately determine the stock level which is important for the development and development of enterprises. Having too much inventory or not having enough stock is causing a certain financial expense.

Accurate management of inventories contributes to the organization and control of activities related to the identification, transport, storage and preservation of sources of raw materials, semi-finished products and other materials required for production, which are complementary parts of a production process, and the whole organization works without any hitches. (Kiracı, 2009: 163)

The data on stocks provide information on how managers should implement strategies. Stable and prudent management of inventory management affects the value of stocks.

Having stock can be seen as a useful application especially in inflationary economies. In such economies, the value of stocks can rise due to price increases and earnings can be obtained. In addition to this, purchases to be made just before the price

increases with foresight or a certain number of ties may also generate a certain level of profits. However, it should be known that the actual gain will be achieved by raising the stock turnover rate, that is, by increasing sales. In economies where inflation is low, it is important to keep stocks, demand fluctuations, order delays, etc. loses its meaning except to remove the negativities that it will bring. Therefore, in such economies demand estimates are made correctly, order delivery times can be predicted, or if uncertainties as a whole are reduced as much as possible, it will be rational to avoid stock keeping costs. (Küçük, 2011: 30)

Stock Turnover Rate, shows how many times stocks are converted into sales in one year. The high stock turnover rate indicates that the operator has good stock management. The high rate of stock turnover provides the opportunity to earn more profit from the operation. However, the high inventory turnover rate may indicate that stocks are held in very small quantities at hand and that customer requests can not be answered. An operator's slow turnover rate can lead to higher stock keeping costs, increased financing requirements, and the ability of products to lose sales capabilities. Inventory turnover rate is calculated by the ratio of the annual cost of sales to the average stock level in terms of currency.

Stock Turnover Rate = Cost of Sold Products / Average Stock Value (Yüksel, 2010: 174)

The purpose of the stockholding of the operator is;

1. To be able to carry out production schedule and capacity planning,

2. Protecting against fluctuations in demand,

3. To take measures against any situation that may be experienced in supplying materials from suppliers,

4. To avoid cost inflation effects,

5. To take advantage of the amount of discount, (in case of large quantity orders, more discounts are made than small quantity orders, and as a result unit cost can be reduced).

6. Reduce the ordering costs (the less ordering costs, the less the ordering cost). (Kiracı, 2009: 163)

1.3.1. Inventory Functions

When the functions of the stocks are called, it is understood that the functions of the stocks and the tasks they fulfill, the situations that cause the stocks to form.

a-) Finished Goods Stock Functions: Uncertainties in customer demand and seasonal or non-seasonal fluctuations cause orders not to be fulfilled. In addition, at the time of production which may occur for various reasons, it may result in failure to meet the demand. Finished product stocks eliminate these shortcomings and provide a stable production plan without major changes in the amount of production.

b-) Functions of Intermediate Stocks: Intermediate stocks are formed among the departments within the enterprise in production as part of an economic mode of production. In this way, production preparation costs can be reduced and production tools can be used more efficiently. Thanks to intermediate stocks, failures or delays that may occur in production units are prevented from stopping production. Balancing can also be achieved by creating intermediate stocks with overtime or shift work between slower workstations with different production rates following each other.

c-) Functions of Raw Material Stocks: The accidents that may occur in the production or transport of the suppliers will cause the production to stop. Raw material stocks eliminate this kind of negativity that would be caused by uncertainties in supply. Besides, when the prices are low, raw material stock is formed by going to purchase way in order to benefit from price advantage or discount possibility. (Top, 2001: 194)

1.4. Cost Related to Inventories

The purchasing cost of the products from domestic or foreign suppliers can also be evaluated within the scope of the preparation costs, general expenses, storage expenses, machinery, equipment, equipment costs, inventory costs, etc.

In addition to this, the alternative cost of money is also an important factor. The entity should consider the use of the money in the alternative financial instruments that it would like to allocate to the stocks and evaluate what their assets may be. It is important that workflow continues here, it is important to work with stock as well as the difficulty of staying stuck.

There are three different costs associated with stocks. These; stock keeping cost, stock keeping cost and order cost.

1.4.1. Cost of Stock Warehousing

The majör concepts are;cost of stock keeping; the costs that an operator has to bear in a certain period. Costs that arise during the operation of the inventory system play an important role in determining the stock policies. These costs vary with the changing stock policy.

Inventory costs are a cost element that must be taken into account when deciding on the optimization of inventory levels.

Cost of stock, cost of stock, quantity, type, place, etc. and they increase directly in proportion to the amount of stock in hand and the increase in holding time.

Inventory costs consist of various components and include costs that vary with the level of inventory held:

Capital Costs Connected to Stocks

Stock facilities and rental depot costs,

Insurance and taxation,

Warehouse management and labor costs,

Costs arising from loss of economic and physical assets of stocks.

1.4.2. Cost of Out of Inventory

Today, modern businesses now prefer to work with as little inventory as possible. However, in the case of businesses having little inventories or stocks, the demand is subject to some costs due to exceeding the amount of stock in hand:

Cost of lost sales,

Reputation cost,

Partial loss of market share,

Lost scoops,

Frequent order cost is given as

1.4.3. Order Cost

If the given order is met through purchases from outside the business, in general,those are the related concepts: approval of the order, ordering, sending the goods, taking the order, making the acceptance inspection. Costs such as postage, telephone, transportation, determination of the quantity and quantity of the goods, examination workmanship and stationery costs for every activity are the costs that arise after the activities related to the invoice.

The cost of ordering covers all costs from procurement of a substance and material to the delivery of the substance and the material to be used in production.

As the number of orders increases (1,2,3..etc.), the ordering costs also increase. On the contrary, as the order quantity grows (1,000, 1,500, 2,000 ...) the ordering costs are falling. That is, there is an inversely proportional relationship between the order quantity and the order costs, which is directly proportional to the order numbers and the order costs. (Kaya, 2004: 9-19)

Upon order production, the customer specifies the desired product characteristics. In this production, it is not necessary to stock the necessary raw materials or materials. Other costs assessed in this group can be listed as transportation, loading and unloading.

1.5. The Importance of Inventory Level in Economy

Inventories in modern production systems are closely related to the manager. Stocks, which were wealth markings centuries ago, nowadays, increases have come to a state of concern and constant control. Stocks for the operator are figures in the profit and loss calculations and only concern finance managers. However, every department has a role in an efficient stock system. Sometimes it is seen that there is an unnecessary semi-finished stock in an operation that is reported to be in great cash trouble, in the amount that can meet the cash need, distributed among the manufacturing departments. In some enterprises, it is known that there are sufficient raw material stocks, and there are some manufacturing incidents like a few minor parts. Such negativities can cause the business to face significant costs as well as slow down business processes.

Businesses whose competition conditions are getting worse and whose profit margins are decreasing have established a more rigorous control system on their stocks in order to be able to continue their activities. Increased productivity in investments has forced managers to use a more cautious and rational use of operating capital and a more rigorous inventory policy. Businesses have begun to check their inventories ahead of time because they are in a bad situation when they are turning over their excess inventories through measures such as cheap sales. The benefits of such a system in terms of operating economy can be listed as follows;

1. Helps in proper execution of production activities. Due to the lack of material and parts, the empty stays go down to a minimum. Stacking between workstations is reduced.

2. The part connected to the stocks provides a healthy financial management as it is determined according to the exact need.

3. Supply and sales costs are reduced.

4. It is possible to arrange the production programs easily and correctly.

5. Many of the information needed by an effective cost accounting system can be collected in an easy and sensitive manner.

6. Reduce the amount of materials and products that are wasted because of inattention, can be intervened without delay for correction.

CHAPTER 2

INVENTORY CONTROL CONCEPT

2.1. Inventory Control Concept

Entries must be supplied or ordered in order to be able to carry on business operations. For this reason, it is possible to have certain stocks, either in the form of safety stocks to meet demand for cycle stochastic or unexpected situations for production of the period concerned, or in the form of intermediate stocks due to waiting and accumulation in production. (Küçük, 2011: 51) Inventories held for these purposes place a certain financial responsibility for the operation. It is therefore of utmost importance to monitor stocks to avoid any setbacks that may arise. Inventory follow-up should be carried out actively between production planning and control, sales, marketing, accounting and, in particular, the warehouse officer, within a plan. In addition, all units must be in an integrated format and the data must be transmitted in a timely manner to these units.

Stock control; is the selection of the most economical position in the monetary direction of the transactions, including the amounts of the semi-finished and finished goods, the order time, the payment terms (advance or futures) price-quantity and the transportation costs of these materials with the first raw material supply. In other words, it is to have the desired commodity ready at the desired time and realize it in the most economical way. (Saygılı, 1991: 138)

The inventory corresponds to independent demand is called distribution inventory/ finished product inventory, while dependent demand inventory is known as manufacturing inventory/raw material inventory and work-in-process (WIP) inventory (Simchi-Levi, Kaminsky & Simchi-Levi, 2004; Toomey, 2000).

Inventory control is the fulfillment of organizational processes for balancing requirements, accumulating and balancing the required materials. (Demir, Gümüşoğlu, 1998: 539)

Stock control; stock quantities and types are determined in the most rational and economical way according to the supply, production and financial possibilities of the enterprises. In short, the main objective in stock control is to carry out production without

interruption by keeping stocks in stock of sufficient amount of what is missing, no more. In addition to this, it helps to find an answer to when and how much supply will be made so that the requested quantity of material can be supplied in the desired quantity, in the desired quantity, at the desired time.

2.2. Purpose and Importance of Inventory Control

The first decision to be made about the stock is the amount of stock, and the second is when the order will be given for the specified quantity. Demand uncertainties include demand forecasting for this and the level of business stock must be determined. Keeping the business stock level low can cause unrequested customer demand and therefore loss of revenue due to lack of stock. For this reason, businesses may seek to increase their stock levels. Having too much inventory causes significant cost elements to the operation. Policies that find the optimum balance between these costs must be identified in order to achieve effective inventory control. In enterprises, inventory control is aimed at keeping stocks at high or low level and minimizing the costs related to stock. (Yuksel, 2010: 172-173)

In the control of stock levels, two limits must be forcibly accepted. Because there are two dangerous situations that the management generally want to prevent. The first is the inadequate inventory that leads to the halt of production and hence the loss of sales, and the second hazardous situation is the inventory that leads to unnecessary transportation costs. The optimal inventory level is somewhere in between these two hazardous situations. Management will determine the amount of stocks at the point where the marginal cost of holding the stock is equal to the expected marginal benefit due to possession of the stock. This is the point of “optimal stock holding”. The word "stocks is the grave of many businesses" is extremely common among experts. Experts want to say that bad stock management will cause a fast job. (Özdemir, 2002: 8)

Inventory Control Benefits; The main benefits of an effective inventory control system, which can be achieved through the contribution of all departments, are as follows:

Proper implementation of the stock policy is ensured. It is possible to arrange the stock requirement in accordance with the market movements.

The materials, tools and equipment required by the production activities are

provided in a timely manner without any interruption to the standstill.

It prevents to go to non-economic excess stock investments. It provides the possibility to maintain the minimum amount of stock required by production and procurement policy.

The necessary suitability of the warehouse area guides to prevent damage during storage, take necessary precautions about stocks that will pass through deterioration and fashion.

Provides convenience in cost accounting with accurate and clear production planning. It also specifies what "what, how much and when" should be supplied.

2.3. Inventory Control Parameters

2.3.1. Demand Forecast

Request; is a purchase request supported by a purchasing power against a good. Demand forecasts are important for building an effective inventory management system. Demand forecasting has a direct impact on the preparation of production plans, the protection of optimal stock levels, and the effective provision of supplies and deviations. The success of the stock level in an enterprise depends on the collection of reliable information, the acquisition of rational stock decisions and the accurate estimation of future profitability. (Kaya, 2004: 80-81)

2.3.2. Procurement Period

There is usually a period of time between the order for an inventory item and the receipt of the item by the owner, which is called the supply period. Functions such as comprehension of the period requirement, selection of the supplier, negotiation of the price and related conditions, and delivery are realized in this process. In other words, it includes the collection of functions such as procurement, grasping needs, selecting a supplier, negotiating price and related conditions and monitoring delivery. The duration of supply can be fixed and variable. Businesses should take this time into account, when ordering. For example, the goods ordering company has to calculate the ordering time, shipping time, possible faults, otherwise it can be difficult. (Manap, 2003: 12)

2.3.3. Determination of the Order Point

Ordering is a bespoke process of verbal or written construction for the production, sending, fetching or purchase of goods. The purchasing management of the enterprises

provides the request of the suppliers, the evaluation of the proposals and the application of the approval rules starting from the demand stage of the product. When determining the ordering time, it is necessary to consider parameters such as purchase requisitions, stock levels, supply time, turnover speed, shelf -life.

The main factors to be taken into account when determining the order point are to purchase the best possible quality at the lowest cost and to ensure timely delivery of the goods received.

As Onwubolu et al. (2006) indicates, inventory management techniques should address two important questions: (i) when to order, and (ii) how much to order.

The answers to these questions need to be reached before you can specify the order point.

What is needed?

How much is needed?

When is it needed?

When should the order be given?

The order period can be defined as the inventory planning period. Indicates the time elapsed between when the order is made and when the goods are obtained. The better the methods of communication, fulfillment and transportation, the less stock investments.

2.4. Inventory Control Costs

It may be more useful if the costs incurred as a result of the transactions carried out within the stock control policies are handled one by one.

1-) Quantity Discounts: A balance must be provided between the discounts that the vendor companies will apply in large purchases and the standard requirement that the operator specifies. Excess purchasing in order to benefit from the amount of discount leads to the cost of stock keeping such as extra storage, insurance, economic depreciation.

2-) Order Costs: It is a cost to carry out activities such as preparation of request forms for a material to be taken from abroad, obtaining informed consent from the necessary departments, conducting research among vendor firms, and approval checks.

3-) Direct Material Costs: Generally, the first material used is directly proportional to the produced quantities and there is not much effect of order volume. However, in some

cases, the amount of discarded and discarded material is high at the beginning, such as setting looms and learning workers. Therefore, in such a case, the enterprise faces a cost element.

4-) Direct Labor Cost: It takes a while for the worker to learn a number of operations even if they have been done before. The learning period depends on the complexity of the operations and the experience of the worker. The smallness of order volume, that is, frequent product change, reduces the labor cost gain through learning. It may be more economical to take advantage of this advantage by keeping stock levels slightly higher. Increasingly directing firms to full automation has reduced direct labor costs. This can be said to be the maintenance and repair cost of the machines.

5-) Overtime and Shift Costs: In order to meet the fluctuations in sales, it may be considered to increase the production with overtime or shift system in the high demand period instead of pre-stocking the excess demand exceeding the demand. If work outside regular hours can meet increasing demand, the cost of stocking is not tolerated. In this case, however, workers are paid a fee above normal.

6-) Costs of Receiving, Training and Overworking of New Workers: Instead of prolonging the working period, new workers are recruited during periods when demand is high or some workers are removed in case of low demand. If this is the case, the cost of the training of new workers and the cost of taking out of the job are counted.

7-) Excessive Capacity Costs: In case of excessive demand, instead of having stocks sometimes, vacant machines are put into operation to meet demand with excess capacity. However, keeping the capacitor high may require repair maintenance and depreciation. The increase in the unit cost of production is due to the constant and varying costs of these costs compared to the cost of inventories.

8-) Customer's Kidnapping Cost: This is also called non-possession cost. In case customer requests can not be met on time and in desired amount, customers should go to the competitor firm. This leads to long term customer loss.

9-) Deprecation and Retaliation Costs: Deprecated quality of stored goods over time can lose value due to reasons such as rapid change of technology and fashion. Here, accurate demand forecasting, storage time and storage conditions are important in terms of reducing costs.

10-) Taxes and Interest Costs: The tax laws of the country may be such as to increase

the tax burden of the operator if the goods are overstocked. Since every stake in TL stands for investment, you have to think about the burden of interest payments.

11-) Storage Costs: Buildings or semi-open areas where stocks are not protected are at a cost even if the property is owned by the owner. Each unit of the storage area (or volume) can be thought of as a machine. A depot also has costs related to investment, maintenance, operation and utilization efficiency.

12-) Transportation Costs: The cost may increase when the amount of the material is reduced below the certain amount in the transportation from the production source to the depot consumption point. For example, if the quantity carried (or the order quantity) is 25% of the capacity of the transport vehicle, the unit transport cost can be very high. When determining the order size, it is also necessary to consider the capacities of transport vehicles. The availability of standard tools according to the order here provides a great cost advantage.

13-) Price Changes: It is very important to determine the stock policies in speculative and inflationary environments where prices change rapidly, while not being a normal business problem. Inventories of raw materials imported from foreign countries are carefully monitored and stock decisions are made at world prices. (Kobu, 2008: 331-333)

2.5. Inventory Control Methods

In industrial enterprises, inventory items are used in production activities in many different and varying amounts. The monitoring of all of them is very difficult and complicated in practice. In other words, it is difficult to find a lot of stock in the production process, to be ready to use at the desired time, and to realize it economically. (Güneçıkan, 2008: 51) There are simple control methods and computer based solution methods applied to reduce this complexity. These control methods vary according to the size of the business, the mode of production, and the variety of inventory items.

2.5.1. Visual Control Method

In this control system, stocks are periodically inspected by an experienced warehouse officer. Inventory items falling below a certain level are immediately ordered. The level and amount of ordering is entirely left to the trainee's experience. Leaving the stock control function in small enterprises to an experienced warehouse clerk is a very inexpensive way of stock control. However, there are some drawbacks to the wide range of visual inspection

methods used in small manufacturing companies, retail stores, especially in food markets. These can be listed as follows;

1. There is a high probability that the order level and quantity will be left to the personal judgment of the warehouse officer.

2. If warehouse stock items are not systematically placed, the warehouse officer is more likely to be misdiagnosed.

3. If the rate of consumption, duration of supply or other factors change, it is difficult to notice this immediately. Taking necessary precautions for this is very difficult. (Kobu, 2008: 335-336)

In general, the point of error is that if the business is small, communication is easy and all processes can be easily carried out by one person. However, the smaller the company, the more likely it is that there should be a certain production plan and that all units (such as staff, warehouse personnel, sales staff, managers, etc.) have to constantly exchange data with each other.

2.5.2. Double-Box Method

In this method, stocks are stored in a box with two compartments. When the first box is completely exhausted, a new order is placed. The quantity in box 2 should meet your needs until the order is received. These boxes can sometimes be thought of as a department or warehouse. (Çelikçap, 1994: 127)

Taking into consideration the changes in delivery and selling times, the sizes of the boxes must be constantly monitored in changing conditions of the day. This inventory control method is often used to control low, low volume and many inventory items. (Küçük, 2011: 60)

2.5.3. Fixed Order Period Method

In this method, the quantities of stock items are determined according to a certain period. The stocks are tried to be completed by giving the order quantities which will complete the determined quantities to certain levels. (Tekin, 2009: 12)

As can be seen in Figure 1, for each of the order periods "ts", orders are placed at the amount that will bring the stocks to the predefined maximum stock level. The volume of

demand or the rate of decrease in stocks varies between periods.

In the first order period, orders have been placed up to "Q1" considering the stock level. Since the second period stocks do not decrease until the first period, they are ordered less than the previous period (Q2 <Q1) and the stocks are brought to the maximum stock level. With other similar fixed periods, orders will be made in amounts that will bring the stock level to the maximum stock level and often the amounts of these orders will be different from each other. (Küçük, 2011: 70)

As a result, it can be said that the intervals between orders are determined in this method, but the amount of the order is different,for every period depending on the change in demand.

2.5.4. Fixed Order Quantity Method

In this method, when the stock goes down to a certain level, a predetermined fixed amount is ordered so as to minimize the total cost of stock. In this model, for each stock item, an order quantity (q), order level and safety stock, which makes the total stock control cost minimum, must be calculated. The fact that the consumption rate differs in each period causes the order time (ts) to vary in each period.

In this method, it can be said that the fixed order quantity should be determined to meet the existing needs.

As seen in Figure 2, the maximum-minimum inventory levels and the inventory level of the order point are predetermined. In the model, the order quantity is fixed with the speed of decrease of the stocks being different and orders are given every time "q". When stocks reach the order point level, they are ordered again and fixed amount.

In general, this method is used in the material requirement planning system, for some special stock units, and when the ordering costs are high. Set fixed order quantities are distributed over periods to meet net needs. If the net requirement at any time is more than the fixed order quantity, the order quantity is increased. (Küçük, 2011: 71-72)

2.5.5. ABC Method

They are grouped as cumulative percentages according to the quantity and value of stocks, and by monitoring stock changes of these groups. The ABC method is used for inventory control, production planning, quality control, sales and distribution.

ABC analysis is an inventory classification technique in which the items in inventory

are classified according to the dollar volume (value) generated in annual sales (Fuerst, 1981)

Inventories according to ABC method; A, B, C groups. Inventories entering Group A bring about 15-20% of annual stock amount and 70-80% of stock value.

Stocks entering group B represent 30-40% of the annual stock amount and 10-20% of the stock value. Stocks entering Group C constitute 45-55% of annual stock amount and 5-10% of stock value. (Tekin, 2009: 13)

Serious loss of sales can occur when there are no staples in group A parts. A continuous visual inspection method should be applied to segment A. In the absence of stock parts in group C, very important losses are not encountered, so stock controls are easier. Periodic oversight may be applied to these inventory items. Parts of class B are not as important as management's special attention, but not as cheap as stocks can be kept in excess. Periodic and continuous inspections can also be used in this inventory item. (Yuksel, 2010: 179)

Stock Part	The unit cost	Monthly Sales (unit)	TL amount	Percent of TLamount	Percentage of staged	Class
Y	750	500	375000	%74	%19	A
P	625	300	187500			
X	100	600	60000	%17	%34	B
W	250	150	37500			
S	50	700	35000			
I	40	600	24000	%9	%47	C
K	50	400	20000			
R	20	1000	20000			

Figure 3. Classification of Stock Parts According to ABC Method

Source: Yüksel, H., (2010), Production / Operations Management, Nobel Publications, Ankara p.179

As can be seen in Table 1.1, Group A corresponds to 74% of total value of stocks, and these stocks occupy 19% of total stock. The value of B group stocks is 15%, the stock area is 34%, the stock value of C group is 9% and the area covered by them is 47%.

Group A, which has a high TL value, represents the group whose stocks are to be continuously monitored.

2.5.6. Computerized Control

Inventory control can be done much more quickly and safely in the case of computer use in enterprises. When information about material exits is processed in the computer, the material that falls below the minimum stock level is also automatically removed. Based on these, a list showing the missing quantities is prepared and sent to the purchasing service for the necessary orders. This information can be easily identified in the light stock levels. Especially in large stores with computer systems suitable for bar code (line code) technology, counting of goods is not regarded as a problem. (Kaya, 2004: 25)

Barcode System: It is a system that identifies products with computers with optical readers. It is an automatic identification data collection system for tracking stocks. Generally, the stock code information of the goods is identified with barcode symbols and the information is transferred to the hosts through the decoders. If stock is demanded or goods are output, bar code label on the goods is deducted from stock.

Benefits of the barcode system;

1. Fast, reliable and practical.

2. Provides control of goods, reduces the cost of accounting for interrupted invoices, and enhances the financial structure of the entity by avoiding the cost of unnecessary inventories.

3. Since the warehouse is located on the computer where the goods are located, the warehouse finds where the goods are located.

4. With this program, it is provided to determine the goods that arrive at the minimum inventory level, to prepare the order lists, and to monitor the goods movements.

For the same event, portable type readers can be used instead of fixed bar code readers. These are programmable readers that are portable, non-heavy, and have memory

on them. Portable readers are the reason for preference when the reader needs to be active, such as inventory counting.

Each product has a variety of features depending on its location and use, and these properties can vary in quality and quantity. Nowadays, to follow this diversity with classical control systems leads to faults and costs. Developing barcoded stock tracking systems have reduced these costs and aimed to save unnecessary time spent on stock follow-up.

With regard to current developments, intelligent stock tracking systems can be mentioned with regard to inventory control; the product lists of the company, the lists of the companies that have been worked on can be uploaded to these programs. These barcode-backed systems can easily record inventory entry and exit procedures. Moreover, thanks to these programs, which can be easily monitored by all the movements, the products in stock, the products in critical level, the products that have not been processed until today, the products that are most traded or the products that are sold the most easily are seen and help to develop different strategies on products without any difficulties .

CHAPTER 3

INVENTORY MANAGEMENT IN THE CONTEXT OF MARKETİNG CASE

3.1. Importance of Inventory Management in the Market and Its Importance

It is the whole of the systems that enable the delivery of the products and services that match the expectations of the marketing, the institution and the customer at the desired place and time, at the desired price and on the desired conditions. (Mucuk, 1991) By definition, marketing is the planning and implementation process for the development, pricing, promotion and dissemination of ideas, goods and services in order to fulfill the responsibilities of achieving personal and organizational goals. According to this definition, there are four basic elements in classical marketing understanding. These elements, known as Marketing's 4P, are decisions about the product, decisions about the price, decisions about the promotion and decisions about distribution.

Inventory Management is the whole of the decisions taken regarding stocks in order to ensure the optimum level of the products supplied by a company. The concept of inventory management has a broad meaning and includes issues such as stock control, supply planning, demand forecasting, inventory cost.

For a starter, it is first necessary to define the term of “stocks”. Material, semi-finished or finished products to be used or marketed in the future are defined as inventories in the literature of the business enterprise. (Demir ve Gümüşoğlu, 1994) The concept of stock being processed in more detail in other parts of the thesis is an issue that is on the agenda in all the operations and business processes of the operator. (Tanyaş ve Baskak, 2006)

Inventory control is defined as the processes that ensure that raw materials, materials, spare parts and ready-made products are kept running without any incomplete, excessive, but sufficient amount of production and marketing activities. In other words, the purpose of inventory control is to find answers to two questions about "when" and "how much" to supply for production or marketing,and sales.

Inventory management and marketing are all related to each other. This relationship can sometimes be in the form of a conflict of mutual interests and sometimes conflicting goals. As the activities related to inventory management are wide and multifaceted, other sections of the business such as production, accounting-finance, purchasing department are also in the interest of marketing department. However, there are differences between departments in terms of the objectives of inventory management. The production and marketing departments want to follow production orders and orders, while the purchasing department wants to monitor the high stock level and non-frequent ordering policy in order to reduce administrative burden and reduce transportation costs. However, the finance and accounting departments are opposed to this investment in order to reduce investment in stocks. The money connected to stocks for the finance department is an idle resource and can not be evaluated elsewhere for the time being. The indispensable condition of good stock management, especially balancing the conflicting demands of operating in cooperation with the marketing department, is to specify policies that take account of the interests of the entire company. (Top , 2006)

3.2. Inventory Management Relationship

3.2.1. Product and Inventory Managment Relationships

Stocks stocked in enterprises are either ready-made products or raw materials that directly affect production and are semi-finished goods. Therefore, any kind of decision taken regarding the stock will affect the product and it also concerns marketing. With a start-up, stock management involves the most management decisions that affect or affect the product. For example; While it is necessary to make different decisions for long-lasting and durable products with long shelf life, it may be necessary to make different decisions for products that have short shelf life or have a risk of deterioration. These decisions and the specific situation of the product directly affect the reaction rate of the marketing department.

The overall sales course of the product, whether it is fast consumable, high volume, whether it is difficult to transport or not, are factors that affect the inventory management decisions. This situation can sometimes cause conflicts and conflicts with the marketing department. While the marketing department always wants to have products available for sale, the stock management department may not supply as many products as needed to optimize the limited storage space. Since a product that takes up a lot of space is stolen from the area of other products, despite the demand of the marketing department, the stock

management cannot provide this product but prefer to bring it on order. Even this element is a factor that needs to be considered by the sales team in the marketing department.

In addition, different approaches should be applied for the products specific to one time. For example; a daily newspaper, only belongs to the day concerned, is unique and private, can not be created again. There are special decision making systems for stock management of such products. As another case; daily milk, such as shelf life of one day, the life course is very short products are evaluated within this scope. For example, decisions regarding blood products, seafood, some foods and similar products vary. For such products in stock management, systems called ”single-term stock models ürün are applied. The decision maker has to make the inventory planning as one-period. Because at the end of the period, the remaining stocks remain unavailable. The decision maker can only order once. If there are too many products in the stocks, the remaining products will not be of value and will be damaged. (Ulucan,2004) On the other hand, if there is less product in stocks, loss of opportunity and customer loss will be faced. In this case there are various mathematical models and formulas in stock management to determine the best order quantity.

The overall life cycle of the product is also an issue that stock management and marketing departments must consider together. As is known, each product has a life cycle, new products are developed (developed), grows (market share increases) and dies (withdrawn from the market). Inventory decisions should be shaped in accordance with the life course of the product coming from the marketing department. The product life cycle may be several years for some goods, while for others it may be as short as a few months or several weeks. Especially electronics and high technology products are examples of this type. In order to avoid this situation, the course should be monitored well and the marketing department should make a faster decision as it will cause great damage.

3.2.2. .The Relationship Between Inventory Cost and Inventory Management

The price in marketing is the monetary value that is paid to obtain a product or service in the most basic sense. For the customer, the price is the amount he / she is willing to pay to have the desired product. Although there are many factors affecting the pricing decisions, one of the most important factors affecting the pricing of a product is the total cost of ownership of the product. Stock costs also have a significant place in the product cost. Even in some cases, inventory costs can reach up to 20 var25% of the total annual value of the product. (Tek, 1984) This is a factor affecting the product price. If stock costs

can be minimized, or at least optimally maintained, they can have a great competitive advantage in marketing, as this will also affect the price offered to the end consumer.

One of the main objectives of inventory management is to create a stock model that minimizes total inventory costs. The more successful this goal is, the more it is saved, and this margin can either be used by the marketing management to serve the competitive purpose by keeping the final price of the product low, or to increase profitability and direct it to other sources.

One of the issues that are most related to inventory management and marketing pricing is quantity discounts. In order to promote the purchase of a certain amount of products, quantity discounts are applied. The stock management and marketing unit makes a decision that does not increase the stocking costs by making a common decision, allowing the marketing to take advantage of the discount on which it can offer a better price and competitive advantage. Since the unit cost of the product received as a result of the discount will be reduced, this can be reflected in the final sale price or the profit can be increased by not changing the price; these decisions are at the disposal of the marketing department.

While making the pricing decisions in marketing management, determining the end user price of the product sometimes makes the main company, sometimes it is left to the pricing market channel. This may result in different pricing, such as supplier prices, dealer prices, and retailer prices. Alternative pricing strategies, such as on-site pricing, geographic pricing, may occur. The pricing decisions to be made by these actors may vary depending on whether they are stocked or not. Agents entering an intense stock of goods can influence the price of the product if they have the power to change the supply balance in the market. Even such distributors can sometimes offer even more advantageous price than the main producer's ex-factory, and sometimes they can price the products in their stocks well above market value when the product is not in the market. Businesses who want to follow a stable pricing strategy in the market have to manage their stocks as well as the stocks of the actors in the lower levels of the distribution chains.

3.2.3. Relation of Inventory Level to Market

As it is known in the promotion mix, activities such as personal sales, sales development elements, advertising, public relations and publicity activities are included. In relation to each of these elements, stock management has interaction in various

dimensions. It is an important condition for the efforts of a consumer to reach the product quickly and to find a product when he / she wants to reach a concrete result.

If the relationship of stock management with personal sales is mentioned; selling the goods in stock is always a source of trust and motivation for the salesperson. There is a huge difference in terms of personal sales between buying a non-stock product and selling a stock. Existing stocks provide impetus for salespersons, because the end result of sales efforts is only through the delivery of the goods, so salespeople first try to dissolve existing products in stock. Even the availability of the product can be used as a competitive element or a sales closure element in a sales call.

One of the components of the promotion is the sales management efforts aimed at selling. These sales development efforts, which are mentioned as sales promotion in English, are not promoted as a promotion but are promoted as promotion. These promotional activities, in which promotional products, payment or price advantages are offered, are carried out at various stages of the product life cycle. However, in many cases, the most important factor affecting the decision of when such activities will be made for products is the stock status of the products. It can be said that such sales developer efforts are made more for the products that are in stock for a period, which are more than stock. In addition, sales incentive efforts can be used more intensively to reduce the stock of shelf-life or out-of-date products to melt the stock at the season changes. This situation requires the marketing department to have close follow-up relationship with stock management. For example, many ”end-of-season inventories g are planned to be related to the campaign stock cycle, which is the motto of many sales development. In addition, many goods that are not sold separately but sometimes as a gift with another product as a package (bundle) can be composed of products accumulated in stocks. With these studies, idle inventories are offered as a sales developer material, while contributing to the sale of other products as well as providing a positive perception to the firm in terms of the consumer as well as providing inefficient resources.

Targeted sales are another area where sales development efforts are related to inventory. When a certain amount of product is received, product sales can be encouraged by making certain amounts of goods, gifts, reimbursements or similar promotions.

Thanks to good and efficient inventory management, some companies can increase their sales by supporting their dealers. For example, Arena, which operates in the technology sector, keeps thousands of products in its own stocks, and when it arrives, it delivers within one day in the city and in one day in different cities. Thus, dealers are able

to offer thousands of kinds of products without the need for stocking. Even with computer aided and online stock integration programs, dealers can see the stocks of the main supplier simultaneously and sell them as if they were their own stocks.

Inventory management can also be used as an advertising element. The message bil Product is in stock dır is an effective message that can also be used in ads. The slogan of leyen new products in stocks “, which does not want to wait, is aimed at customers who want to buy the product from stock, is often used for attracting attention and news.

3.2.4. Distribution of Marketing Components and Inventory Management

The phenomenon of distribution in marketing and stock management are completely interrelated to one another in an intertwined manner that will be an integral part of each other. Distribution is one of the most important functions of marketing because it is a function in which the final result of all marketing efforts will be taken. Distribution is the process of delivering the products produced to the target points and covering the delivery to the customer. The functions included in the distribution sub-mix include the spatial and material dimensions of all marketing activities and other 3Ps. The distribution covers the delivery of appropriate products to the buyers at appropriate times and places at appropriate times and the persons, institutions, establishments, places, vehicles and activities within and outside the organization.

Inventory management decisions and variables are at the forefront at every stage of the distribution chain. Especially in intermediate stages of distribution network, stocks of suppliers, distributor stocks, retail stocks can be stocked at different stages, and all of these variables such as stock accumulation, which will not be in stock, and in what direction the stocks will flow are all related to marketing. Sometimes the parent company may choose a policy to stock the end user by pushing their stocks towards the end user. Alternatively, when full-time delivery systems are used, the delivery decisions of the distributor and supplier can be shaped as needed and the order is passed. Since all these different situations are factors that affect the speed of the product's arrival and the time of supply, the distribution function and stock management are closely related. The main firm, the decision to make stockings at branches or in different enterprises and the decisions on how to proceed are always related to stock management. Especially in terms of supply chain management, the importance of this issue becomes more apparent.

At this point, it is necessary to give a definition of the concept of supply chain. The

supply chain is a network of service and distribution options, which technically fulfill material supply processes, convert them into semi-finished products and then deliver them to customers through the distribution channel. Supply chain management is an activity covering the control and coordination of all material and information flows (upstream, input and downstream) and downstream (downstream, distribution and post-marketing services) in the chain, which takes place until the raw material is delivered to the end user (Eymen, 2008).

All the elements within the supply chain are considered as separate firms and customers. Figure 1 shows the stock areas within a supply chain. As can be seen from the first supplier to the final consumer decision can be stocked at all levels of the chain. One of the most important decisions of marketing management is to determine how the stocks will be distributed and structured in coordination with the inventory management, as these inventories will have a great impact on sales and distribution rate. For example, if the brokerage business can handle a large amount of stock itself, marketing management will then decide on a distribution decision, and perhaps encourage the broker to keep more stock, thus reducing the cost of distribution and operation.

CHAPTER 4

4. Stock Managment Application From The Industry

4.1:Regression and statistical models

Inventory level can be significant to effect number of item are sold.In Market many companies try to impress their customers by different ways.Some of them highligt their product's specality or how this product is distinguished from others by their quality.Some of them put a single product in glass basket to show that having that product make you privileged.In thıs chapter,results are examined by increasing inventory level to see if this effects sales positively or not.

The model is used is regression model.There is one independent variable and one dependent variable in that model.Independent variable is level of inventory and dependent variable is number of item that is sold.Relationship between those two are examined and try to observe how much change of inventory level can cause more sales.

Y=a+bx.

Y=Number of item sold.

X=Inventory level

A=Intercept of Model

B=Slope of the model.

4.2. Adana Optımum

In Adana's stores 5 products are examined.First relationship between sales and inventory level are observed.Then inventory level is increased to see if number of unit sold give reaction to change of inventory level.

4.2.1. Socks product

Inventory level and sales numbers are shown by table 1 for socks products for Adana ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 1: Adana Optımum store’s sock’s sales and Inventory level

Weeks	sales	İnv.lvl	Order	Cumulative sales	Cumulative İnv.lvl	sales change %	İnv.lvl change
1	10	20	0	10	20	-	-
2	8	10	0	18	30	-0,2	-0,5
3	12	22	20	30	52	0,5	1,2
4	6	10	0	36	62	-0,5	-0,545454545
5	13	24	20	49	86	1,166666667	1,4
6	8	11	0	57	97	-0,384615385	-0,541666667
7	12	23	20	69	120	0,5	1,090909091
8	7	11	0	76	131	-0,416666667	-0,52173913
9	14	24	20	90	155	1	1,181818182
10	12	20	10	102	175	-0,142857143	-0,166666667
11	13	28	20	115	203	0,083333333	0,4
12	16	35	20	131	238	0,230769231	0,25
13	10	19	0	141	257	-0,375	-0,457142857
14	17	34	25	158	291	0,7	0,789473684
15	11	17	0	169	308	-0,352941176	-0,5
16	19	36	30	188	344	0,727272727	1,117647059
17	11	17	0	199	361	-0,421052632	-0,527777778
18	8	16	10	207	377	-0,272727273	-0,058823529
19	4	8	0	211	385	-0,5	-0,5
20	13	24	20	224	409	2,25	2
21	6	11	0	230	420	-0,538461538	-0,541666667
22	18	30	25	248	450	2	1,727272727
23	19	32	20	267	482	0,055555556	0,066666667
24	11	23	10	278	505	-0,421052632	-0,28125
25	6	12	0	284	517	-0,454545455	-0,47826087
26	4	6	0	288	523	-0,333333333	-0,5
27	2	2	0	290	525	-0,5	-0,666666667

Table 2:Regression of sock's sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,955314234
R Square	0,912625286
Adjusted R Square	0,908984673
Standart Error	0,233646156
Observations	26

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	13,68469903	13,68469903	250,6790097	3,3282E-14
Residual	24	1,310172627	0,054590526		
Total	25	14,99487166			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,019090582	0,046789315	-0,408011564	0,68688231	-0,115658981	0,077477818
X1 variable	0,878293318	0,055472865	15,83284591	3,3282E-14	0,763802952	0,992783683

According to the results in Table 2, there is a statistically significant relationship between sales and stock ($p < 0.05$). There is a high degree of relationship between variables ($R = 0.95$). The specificity coefficient R2 is found to be 0.91, and it can be said that 91% of the changes in sales depend on the change in inventory level. According to the result of F statistic in which the general significance of the model was evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level are statistically significant ($p < 0.05$). When the regression equation is examined, it is observed that the 1-branche changes in the inventory level will cause a change of 0.87 bn in the sales.As a result of the inventory level change, T-Test isconducted to determine whether there is a difference between old sales and new sales averages. The hypotheses to be established are as follows:

H0: There is no significant difference between old sales averages and new sales averages.

H1: There is a meaningful difference between the old sales averages and the new sales averages.

The t-test results are shown in the following table:

Table 3: Results of t-Test on Sales of Adana Optımum Store Sock Product

	New sales	*Old sales*
Mean	17,22222222	10,74074074
Variance	33,56410256	21,50712251
Observation	27	27
Pearson Correlation	0,9584834	
Hypothesized Mean	0	
df	26	
t Stat	17,83230815	
P(T<=t) one tail	2,11151E-16	
t critical one tail	1,70561792	
P(T<=t) two tail	4,22302E-16	
t critical two tail	2,055529439	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.2.2. Shoes product

Inventory level and sales numbers are shown by table 4 for shoes products for Adana ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week

Table 4: Adana Optımum store's shoes's sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	132	457	132	457	-	-
	195	325	327	782	1,477272727	0,711159737
	114	130	441	912	0,348623853	0,166240409
	133	16	574	928	0,301587302	0,01754386
600	180	483	754	1411	0,31358885	0,520474138
	192	303	946	1714	0,25464191	0,214741318
400	193	511	1139	2225	0,204016913	0,298133022
	161	318	1300	2543	0,141352063	0,142921348
400	187	557	1487	3100	0,143846154	0,219032639
	111	370	1598	3470	0,07464694	0,119354839
	128	259	1726	3729	0,080100125	0,074639769
600	182	731	1908	4460	0,105446118	0,196031108
	106	549	2014	5009	0,055555556	0,12309417
	199	443	2213	5452	0,098808342	0,088440807
600	199	844	2412	6296	0,089923181	0,154805576
	118	645	2530	6941	0,048922056	0,102445997
	185	527	2715	7468	0,07312253	0,075925659
	130	342	2845	7810	0,047882136	0,045795394
600	165	812	3010	8622	0,057996485	0,10396927
	141	647	3151	9269	0,046843854	0,075040594
	184	506	3335	9775	0,058394161	0,054590571
600	115	922	3450	10697	0,034482759	0,094322251
	107	807	3557	11504	0,031014493	0,075441713
	166	700	3723	12204	0,046668541	0,060848401
	169	534	3892	12738	0,0453935	0,043756146
	109	365	4001	13103	0,028006166	0,02865442
	134	256	4135	13359	0,033491627	0,01953751
600	125	722	4260	14081	0,030229746	0,054045962
	166	597	4426	14678	0,038967136	0,042397557
	129	431	4555	15109	0,029145956	0,029363674
	152	302	4707	15411	0,033369923	0,019988087
	148	150	4855	15561	0,031442532	0,009733307

Table 5:Regression of shoes's sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,833975234
R Square	0,695514692
Adjusted R Square	0,685365181
Standart Error	0,146064153
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	1,462003821	1,462004	68,52692	3,06436E-09
Residual	30	0,6400421	0,021335		
Total	31	2,102045921			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,043342389	0,033922134	-1,2777	0,211154	-0,112620628	0,02593585
X1 variable	1,463312572	0,176769158	8,278099	3,06E-09	1,102301789	1,824323355

According to the results in Table 5, there is a statistically significant relationship between sales and stock ($p < 0.05$). There is a high degree of relationship between variables ($R = 0.69$). The specificity coefficient R2 was found to be 0.68, and it can be said that 68% of the changes in sales depend on the change in stock amount. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 1,46 branche in sales.

Table 6: Results of t-Test on Sales of Adana Optımum Store Shoe Product

	New sales	*Old sales*
Mean	242,75	151,71875
Variance	2533,447742	989,6280242
Observation	32	32
Pearson Correlation	1	
Hypothesized Mean	0	
df	31	
t Stat	27,28212865	
P(T<=t) one tail	1,54611E-23	
t critical one tail	1,695518783	
P(T<=t) two tail	3,09222E-23	
t critical two tail	2,039513446	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages.

4.2.3 T-shirt Product

Inventory level and sales numbers are shown by table 7 for shoes products for Adana ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 7: Adana Optımum store’s T-shirt’s sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	246	574	293	328		
	293	328	575	1163	0,962457338	2,545732
800	282	835	816	1716	0,419130435	0,475494
	241	553	1044	2028	0,279411765	0,181818
	228	312	1333	2912	0,276819923	0,435897
800	289	884	1554	3507	0,165791448	0,204327
	221	595	1764	3881	0,135135135	0,106644
	210	374	2056	4845	0,16553288	0,24839
800	292	964	2258	5517	0,098249027	0,1387
	202	672	2491	5987	0,103188663	0,085191
	233	470	2773	7024	0,113207547	0,173209
800	282	1037	3015	7779	0,087270105	0,107489
	242	755	3258	8292	0,080597015	0,065947
	243	513	3461	8562	0,062308165	0,032562
	203	270	3738	9429	0,080034672	0,101261
800	277	867	4027	10019	0,077314072	0,062573
	289	590	4314	10320	0,071268935	0,030043
	287	301	4598	10334	0,065832174	0,001357
	284	14	4849	10864	0,054588952	0,051287
800	251	530	5063	11143	0,044132811	0,025681
	214	279	5344	12008	0,055500691	0,077627
800	281	865	5621	12592	0,051833832	0,048634
	277	584	5882	12899	0,046433019	0,024381
	261	307	6091	13745	0,035532132	0,065586
800	209	846	6332	14382	0,039566574	0,046344
	241	637	6615	14778	0,04469362	0,027534
	283	396	6901	14891	0,043235072	0,007647
	286	113	7140	15518	0,034632662	0,042106
800	239	627	7416	15906	0,038655462	0,025003
	276	388	7652	16018	0,031823085	0,007041
	236	112	7868	16694	0,028227914	0,042203
800	216	676	8077	17154	0,026563294	0,027555

Table 8:Regression of T-shirt's sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,957102512
R Square	0,916045218
Adjusted R Square	0,913150226
Standart Error	0,052636637
Observations	31

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	0,876689385	0,876689	316,424	3,83198E-17
Residual	29	0,080347852	0,002771		
Total	30	0,957037237			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,056164892	0,010177085	5,51876	6,01E-06	0,035350415	0,076979368
X1 variable	0,376746708	0,021179452	17,78831	3,83E-17	0,333429864	0,420063552

According to the results in Table 8, there is a statistically significant relationship between sales and stock ($p < 0.05$). There is a high degree of relationship between variables ($R = 0.95$). The specificity coefficient R2 is found to be 0.91, and it can be said that 91% of the changes in sales depend on the change in stock amount. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined,inventory level are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,37 branche in sales.

Table 9: Results of t-Test on Sales of Adana Optımum Store T-shirt Product

	New sales	*Old sales*
Mean	380,34375	253,5625
Variance	2096,990927	931,995968
Observation	32	32
Pearson Correlation	1	
Hypothesized Mean	0	
df	31	
t Stat	46,9843256	
P(T<=t) one tail	1,1124E-30	
t critical one tail	1,695518783	
P(T<=t) two tail	2,2248E-30	
t critical two tail	2,039513446	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.2.4.Hoodie Product

Inventory level and sales numbers are shown by table 10 for T-shirt products for Adana ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 10: Adana Optımum store’s Hoodie’s sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	129	312	129	312		
104	153	287	282	599	1,186046512	0,919872
132	129	266	411	865	0,457446809	0,444073
183	154	320	565	1185	0,374695864	0,369942
101	127	267	692	1452	0,224778761	0,225316
157	157	297	849	1749	0,226878613	0,204545
161	153	301	1002	2050	0,180212014	0,172098
125	148	273	1150	2323	0,147704591	0,133171
161	143	286	1293	2609	0,124347826	0,123117
163	145	306	1438	2915	0,112142305	0,117286
107	138	268	1576	3183	0,09596662	0,091938
182	130	312	1706	3495	0,08248731	0,098021
109	151	291	1857	3786	0,088511137	0,083262
137	141	277	1998	4063	0,075928918	0,073164
172	125	308	2123	4371	0,062562563	0,075806
120	139	303	2262	4674	0,065473387	0,069321
105	150	269	2412	4943	0,066312997	0,057552
157	133	276	2545	5219	0,055140962	0,055837
164	157	307	2702	5526	0,061689587	0,058824
151	127	301	2829	5827	0,047002221	0,05447
122	129	296	2958	6123	0,045599152	0,050798
119	123	286	3081	6409	0,04158215	0,046709
113	132	276	3213	6685	0,042843233	0,043064
126	139	270	3352	6955	0,043261749	0,040389
133	145	264	3497	7219	0,043257757	0,037958
160	137	279	3634	7498	0,039176437	0,038648
171	141	313	3775	7811	0,03880022	0,041744
107	130	279	3905	8090	0,034437086	0,035719
112	148	261	4053	8351	0,037900128	0,032262
158	136	271	4189	8622	0,033555391	0,032451
131	152	266	4341	8888	0,03628551	0,030851
194	136	308	4477	9196	0,031329187	0,034653
143	136	315	4613	9511	0,030377485	0,034254
100	131	279	4744	9790	0,028398006	0,029334

Table 11:Regression of Hoodie's sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,993765484
R Square	0,987569837
Adjusted R Square	0,987168864
Standart Error	0,024209408
Observations	33

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	1,44351407	1,443514	2462,934	4,1658E-31
Residual	31	0,01816896	0,000586		
Total	32	1,46168303			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,018712163	0,0051612	-3,62554	0,001022	-0,029238509	-0,008185816
X1 variable	1,233335795	0,02485164	49,62795	4,17E-31	1,182650549	1,284021041

According to the results in Table 11, there is a statistically significant relationship between sales and stock ($p < 0.05$). There is a high degree of relationship between variables ($R = 0.99$). The specificity coefficient R2 is found to be 0.98, and it can be said that 98% of the changes in sales depend on the inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the İnventory level will cause a change of 1,233 branche in sales.

Table 12: Results of t-Test on Sales of Adana Optımum Store Hoodie Product

	New sales	*Old sales*
Mean	171,6211765	139,529412
Variance	152,686938	100,923351
Observation	34	34
Pearson Correlation	1	
Hypothesized Mean	0	
df	33	
t Stat	80,98589581	
P(T<=t) one tail	7,61021E-40	
t critical one tail	1,692360309	
P(T<=t) two tail	1,52204E-39	
t critical two tail	2,034515297	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05.And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.2.5 Short Product

Inventory level and sales numbers are shown by table 13 for S products for Adana ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 13: Adana Optımum store’s short’s sales and Inventory level.

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	269	379	269	379		
270	245	380	514	759	0,910780669	1,002639
223	234	358	748	1117	0,455252918	0,471673
236	230	360	978	1477	0,307486631	0,322292
218	278	348	1256	1825	0,284253579	0,235613
257	260	327	1516	2152	0,207006369	0,179178
244	262	311	1778	2463	0,172823219	0,144517
315	285	364	2063	2827	0,160292463	0,147787
276	283	355	2346	3182	0,137178866	0,125575
241	282	313	2628	3495	0,120204604	0,098366
327	250	358	2878	3853	0,095129376	0,102432
264	239	372	3117	4225	0,08304378	0,096548
248	282	381	3399	4606	0,090471607	0,090178
259	237	358	3636	4964	0,06972639	0,077725
238	241	359	3877	5323	0,066281628	0,072321
236	277	354	4154	5677	0,071446995	0,066504
238	260	315	4414	5992	0,062590274	0,055487
299	287	354	4701	6346	0,06502039	0,059079
285	241	352	4942	6698	0,051265688	0,055468
276	236	387	5178	7085	0,047753946	0,057778
221	270	372	5448	7457	0,052143685	0,052505
229	271	331	5719	7788	0,049743025	0,044388
321	282	381	6001	8169	0,04930932	0,048921
232	249	331	6250	8500	0,041493084	0,040519
299	241	381	6491	8881	0,03856	0,044824
240	264	380	6755	9261	0,040671699	0,042788
247	260	363	7015	9624	0,038490007	0,039197
264	273	367	7288	9991	0,038916607	0,038134
253	253	347	7541	10338	0,034714599	0,034731
222	275	316	7816	10654	0,036467312	0,030567
275	257	316	8073	10970	0,032881269	0,02966
252	261	311	8334	11281	0,032329989	0,02835
334	236	384	8570	11665	0,028317735	0,03404

Table 14:Regression of Short's sales change % and Inventory level change %

Regresyon İstatistikleri	
Multiple R	0,995574097
R Square	0,991167782
Adjusted R Square	0,990873375
Standart Error	0,016486796
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	0,91510556	0,915106	3366,655	2,25223E-32
Residual	30	0,00815443	0,000272		
Total	31	0,92326			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,009515789	0,00352078	2,702751	0,01121	0,0023254	0,016706178
X1 variable	0,923865021	0,01592242	58,02289	2,25E-32	0,891347093	0,95638295

According to the results in Table 14, there is a statistically significant relationship between sales and stock ($p < 0.05$). There is a high degree of relationship between variables ($R = 0.99$). The specificity coefficient R2 is found to be 0.99, and it can be said that 99% of the changes in sales depend on the change in stock amount. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,923 branche in sales.

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

Table 15: Results of t-Test on Sales of Adana Optımum Store Short Product

	New sales	*Old sales*
Mean	312,5032258	260,419355
Variance	449,6423226	312,251613
Observation	31	31
Pearson Correlation	1	
Hypothesized Mean	0	
df	30	
t Stat	82,0543785	
P(T<=t) one tail	3,66809E-37	
t critical one tail	1,697260887	
P(T<=t) two tail	7,33618E-37	
t critical two tail	2,042272456	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.3. Ank Gordiom

In Gordion's stores 5 products are examined.First relationship between sales and inventory level are observed.Then inventory level is increased to see if number of unit sold give reaction to change of inventory level.

4.3.1 Sock product

Inventory level and sales numbers are shown by table 16 for Sock product for Gordion 's stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week

Table 16: Ank Gordion store's Sock's sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
0	65	450	65	450		
400	100	385	165	835	1,538461538	0,855555556
0	126	285	291	1120	0,763636364	0,341317365
0	136	359	427	1479	0,467353952	0,320535714
200	207	423	634	1902	0,484777518	0,286004057
200	218	216	852	2118	0,34384858	0,113564669
0	564	698	1416	2816	0,661971831	0,329556185
700	174	634	1590	3450	0,122881356	0,225142045
500	190	1360	1780	4810	0,119496855	0,394202899
900	237	1170	2017	5980	0,133146067	0,243243243
0	226	933	2243	6913	0,112047595	0,156020067
0	233	1507	2476	8420	0,103878734	0,217995082
800	217	1274	2693	9694	0,087641357	0,151306413
0	330	1057	3023	10751	0,122539918	0,109036517
0	259	727	3282	11478	0,08567648	0,067621617
0	168	1368	3450	12846	0,0511883	0,119184527
900	196	1200	3646	14046	0,056811594	0,093414292
0	188	1004	3834	15050	0,051563357	0,071479425
0	188	816	4022	15866	0,04903495	0,054219269
0	118	1128	4140	16994	0,029338637	0,071095424
500	158	1010	4298	18004	0,038164251	0,059432741
0	95	1452	4393	19456	0,022103304	0,080648745
600	92	1357	4485	20813	0,020942408	0,069747122
0	137	1265	4622	22078	0,030546265	0,060779321
0	125	1128	4747	23206	0,027044569	0,051091584
0	109	1003	4856	24209	0,022961871	0,043221581
0	116	894	4972	25103	0,023887974	0,036928415
0	167	778	5139	25881	0,033588093	0,030992312
0	124	1111	5263	26992	0,024129208	0,042927244
500	137	987	5400	27979	0,026030781	0,03656639
0	139	850	5539	28829	0,025740741	0,030379928
0	79	711	5618	29540	0,014262502	0,024662666
0	39	632	5657	30172	0,006941972	0,021394719

Table 17:Regression of Sock's sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,903954375
R Square	0,817133513
Adjusted R Square	0,811037963
Standart Error	0,136678246
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regresyon	1	2,50425728	2,504257	134,0541	1,35718E-12
Fark	30	0,56042828	0,018681		
Toplam	31	3,06468557			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,076103571	0,03265132	-2,3308	0,026675	-0,142786461	-0,009420682
X1 variable	1,691932052	0,14613116	11,57817	1,36E-12	1,393492403	1,990371701

According to the results in Table 17, there is a statistically significant relationship between sales and stock ($p < 0.05$). There is a high degree of relationship between variables ($R = 0.90$). The specificity coefficient R2 was found to be 0.81, and it can be said that 81% of the changes in sales depend on the change in stock amount. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 1,69 branche in sales.

Table 18: Results of T-Test on Sales of Ank Gordion Store Sock Product

	New sales	*Old sales*
Mean	1533,884375	175,5625
Variance	437816,0317	8476,38306
Observation	32	32
Pearson Correlation	-0,075606456	
Hypothesized Mean	0	
df	31	
t Stat	11,38496054	
P(T<=t) one tail	6,6301E-13	
t critical one tail	1,695518783	
P(T<=t) two tail	1,32602E-12	
t critical two tail	2,039513446	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages.

4.3.2 Shoe product

Inventory level and sales numbers are shown by table 19 for Shoe products for Gordion ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 19: Gordion store’s Shoe’s sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
150	88	100	88	100		
	73	90	161	190	0,829545455	0,9
300	137	137	298	327	0,850931677	0,721052632
200	128	244	426	571	0,429530201	0,74617737
	100	191	526	762	0,234741784	0,334500876
	128	503	654	1.265	0,243346008	0,660104987
500	184	375	838	1.640	0,281345566	0,296442688
	39	391	877	2.031	0,046539379	0,238414634
	49	452	926	2.483	0,055872292	0,222550468
500	168	403	1.094	2.886	0,181425486	0,162303665
	114	235	1.208	3.121	0,104204753	0,081427581
	149	321	1.357	3.442	0,123344371	0,10285165
500	151	472	1.508	3.914	0,111274871	0,137129576
	146	321	1.654	4.235	0,096816976	0,082013286
	218	175	1.872	4.410	0,131801693	0,041322314
	274	357	2.146	4.767	0,146367521	0,080952381
600	184	483	2.330	5.250	0,085740913	0,101321586
	113	299	2.443	5.549	0,048497854	0,056952381
	84	386	2.527	5.935	0,034383954	0,069562083
	90	602	2.617	6.537	0,035615354	0,101432182
	94	512	2.711	7.049	0,035918991	0,07832339
900	138	418	2.849	7.467	0,050903726	0,059299191
	143	280	2.992	7.747	0,05019305	0,037498326
	119	338	3.111	8.085	0,039772727	0,043629792
	198	219	3.309	8.304	0,06364513	0,027087199
	171	221	3.480	8.525	0,051677244	0,02661368
	234	50	3.714	8.575	0,067241379	0,005865103
	260	116	3.974	8.691	0,070005385	0,013527697
	244	256	4.218	8.947	0,061399094	0,029455759
300	103	312	4.321	9.259	0,024419156	0,034872024
750	138	209	4.459	9.468	0,031937052	0,022572632
	171	371	4.630	9.839	0,038349406	0,039184622
	41	200	4.671	10.039	0,008855292	0,020327269

Table 20: Regression of Shoe's sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,88878522
R Square	0,789939168
Adjusted R Square	0,78293714
Standart Error	0,094596519
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	1,00953211	1,009532	112,8158	1,10306E-11
Residual	30	0,26845504	0,008949		
Total	31	1,27798715			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,014696518	0,0207846	0,707087	0,484969	-0,027751294	0,05714433
X1 variable	0,752561254	0,07085279	10,62148	1,1E-11	0,607860557	0,897261951

According to the results in Table 20, there is a statistically significant relationship between sales and stock ($p < 0.05$). There is a high degree of relationship between variables ($R = 0.88$). The specificity coefficient R2 is found to be 0.78, and it can be said that 78% of the changes in sales depend on the change in stock amount. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,75 branche in sales.

Table 21: Results of T-Test on Sales of Gordion Store Shoe Product

	New sales	*Old sales*
Mean	148,6227273	141,545455
Variance	4015,517983	3642,19318
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	13,47322023	
P(T<=t) one tail	4,88772E-15	
t critical one tail	1,693888748	
P(T<=t) two tail	9,77545E-15	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.3.3 T-shirt product

Inventory level and sales numbers are shown by table 22 for T-shirt products for Gordion ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 22: Gordion store’s T-shirt’s sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
150	116	100	116	100		
	139	284	255	384	1,198275862	2,84
300	138	345	393	729	0,541176471	0,8984375
200	139	407	532	1.136	0,353689567	0,55829904
	104	568	636	1.704	0,195488722	0,5
	211	464	847	2.168	0,331761006	0,272300469
500	199	253	1.046	2.421	0,234946871	0,116697417
	224	554	1.270	2.975	0,21414914	0,228831062
	166	830	1.436	3.805	0,130708661	0,278991597
500	218	664	1.654	4.469	0,151810585	0,174507227
	194	938	1.848	5.407	0,117291415	0,209890356
	220	744	2.068	6.151	0,119047619	0,137599408
500	123	524	2.191	6.675	0,059477756	0,0851894
	108	1201	2.299	7.876	0,04929256	0,179925094
	200	1093	2.499	8.969	0,086994345	0,138776028
	198	893	2.697	9.862	0,079231693	0,099565169
600	131	695	2.828	10.557	0,048572488	0,070472521
	112	564	2.940	11.121	0,03960396	0,053424268
	150	452	3.090	11.573	0,051020408	0,040643827
	100	302	3.190	11.875	0,03236246	0,026095222
	107	202	3.297	12.077	0,03354232	0,017010526
900	115	695	3.412	12.772	0,034880194	0,057547404
	49	580	3.461	13.352	0,014361079	0,045411838
	32	531	3.493	13.883	0,009245883	0,039769323
	64	499	3.557	14.382	0,018322359	0,03594324
	62	435	3.619	14.817	0,017430419	0,030246141
	74	373	3.693	15.190	0,020447637	0,025173787
	79	299	3.772	15.489	0,021391822	0,019684003
	119	220	3.891	15.709	0,03154825	0,014203628
300	91	101	3.982	15.810	0,023387304	0,006429435
750	118	210	4.100	16.020	0,02963335	0,013282732
	108	592	4.208	16.612	0,026341463	0,036953808
	88	484	4.296	17.096	0,020912548	0,029135565

Table 23: Regression of T-shirt's sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,925772387
R Square	0,857054512
Adjusted R Square	0,852289663
Standart Error	0,09549666
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	1,64034656	1,640347	179,8702	3,30048E-14
Residual	30	0,27358836	0,00912		
Total	31	1,91393492			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,055451617	0,01851176	2,995481	0,005452	0,017645565	0,093257669
X1 variable	0,447764658	0,03338645	13,41157	3,3E-14	0,37958044	0,515948877

According to the results in Table 23, there is a statistically relationship between sales and inventory level ($p < 0.05$). There is a relationship between variables ($R = 0.92$). The specificity coefficient R2 is found to be 0.85, and it can be said that 85% of the changes in sales depend on the inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the inventory level will cause a change of 0,44 branche in sales

Table 24: Results of T-Test on Sales of Gordion T-shirt Product

	New sales	*Old sales*
Mean	143,2	130,1818182
Variance	3397,185	2807,590909
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	14,11368398	
P(T<=t) one tail	1,36137E-15	
t critical one tail	1,693888748	
P(T<=t) two tail	2,72273E-15	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.3.4 Hoodie

Inventory level and sales numbers are shown by table 25 for Hoodie products for Gordion ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 25: Gordion store's Hoodie sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	48	182	48	182		
	43	134	91	316	0,895833333	0,736263736
	52	91	143	407	0,571428571	0,287974684
300	57	39	200	446	0,398601399	0,095823096
	84	282	284	728	0,42	0,632286996
	107	198	391	926	0,376760563	0,271978022
500	78	91	469	1.017	0,199488491	0,098272138
	89	513	558	1.530	0,189765458	0,504424779
	100	424	658	1.954	0,17921147	0,277124183
	107	324	765	2.278	0,162613982	0,165813715
500	67	217	832	2.495	0,087581699	0,095258999
	112	650	944	3.145	0,134615385	0,260521042
	65	538	1.009	3.683	0,068855932	0,171065183
	84	473	1.093	4.156	0,083250743	0,128427912
	135	389	1.228	4.545	0,123513266	0,093599615
400	128	254	1.356	4.799	0,104234528	0,055885589
	87	526	1.443	5.325	0,064159292	0,109606168
	106	439	1.549	5.764	0,073458073	0,082441315
200	119	333	1.668	6.097	0,076823757	0,05777238
	116	414	1.784	6.511	0,069544365	0,067902247
600	92	298	1.876	6.809	0,051569507	0,045768699
	98	806	1.974	7.615	0,052238806	0,118372742
	79	708	2.053	8.323	0,040020263	0,092974393
	52	629	2.105	8.952	0,025328787	0,075573711
	122	577	2.227	9.529	0,057957245	0,06445487
	92	455	2.319	9.984	0,041311181	0,047748977
	83	363	2.402	10.347	0,035791289	0,036358173
	98	280	2.500	10.627	0,040799334	0,027060984
500	94	182	2.594	10.809	0,0376	0,017126188
	78	588	2.672	11.397	0,030069391	0,054399112
	76	510	2.748	11.907	0,028443114	0,044748618
	114	434	2.862	12.341	0,041484716	0,036449148
	70	320	2.932	12.661	0,024458421	0,025929827

Table 26: Regression of Hoodi's sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,801590364
R Square	0,642547111
Adjusted R Square	0,630632015
Standart Error	0,116010125
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regresyon	1	0,72577033	0,72577	53,92714	3,52229E-08
Fark	30	0,40375047	0,013458		
Toplam	31	1,1295208			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,015595478	0,02745002	0,568141	0,574168	-0,040464935	0,071655892
X1 variable	0,878745479	0,11966286	7,34351	3,52E-08	0,634361307	1,123129651

According to the results in Table 26, there is a statistically significant relationship between sales and stock ($p < 0.05$). There is a high degree of relationship between variables ($R = 0.80$). The specificity coefficient R2 was found to be 0.64, and it can be said that 64% of the changes in sales depend on the change in stock amount. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,87 branche in sales

Table 27: Results of T-Test on Sales of Gordion T-shirt Product

	New sales	*Old sales*
Mean	97,73333	88,8485
Variance	693,9442	573,508
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	21,31265	
P(T<=t) one tail	8,95E-21	
t critical one tail	1,693889	
P(T<=t) two tail	1,79E-20	
t critical two tail	2,036933	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.3.5.Short product

Inventory level and sales numbers are shown by table 28 for Hoodie products for Gordion ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week

Table 28: Gordion store's Short sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	90	100	90	100		
200	106	210	196	310	1,177777778	2,1
	78	104	274	414	0,397959184	0,335483871
300	135	326	409	740	0,49270073	0,787439614
250	146	441	555	1.181	0,356968215	0,595945946
	170	295	725	1.476	0,306306306	0,249788315
350	167	475	892	1.951	0,230344828	0,321815718
500	125	808	1.017	2.759	0,140134529	0,414146591
	113	683	1.130	3.442	0,111111111	0,247553461
	112	570	1.242	4.012	0,099115044	0,165601395
	163	458	1.405	4.470	0,131239936	0,114157527
	120	295	1.525	4.765	0,085409253	0,065995526
800	109	975	1.634	5.740	0,07147541	0,204616999
	91	866	1.725	6.606	0,055691554	0,15087108
	131	775	1.856	7.381	0,075942029	0,11731759
	140	644	1.996	8.025	0,075431034	0,08725105
	171	504	2.167	8.529	0,085671343	0,062803738
	108	333	2.275	8.862	0,049838486	0,039043264
	105	225	2.380	9.087	0,046153846	0,025389303
250	109	370	2.489	9.457	0,045798319	0,040717509
300	104	561	2.593	10.018	0,041783849	0,059321138
	129	457	2.722	10.475	0,049749325	0,045617888
	123	328	2.845	10.803	0,045187362	0,031312649
	97	205	2.942	11.008	0,034094903	0,01897621
	86	108	3.028	11.116	0,029231815	0,009811047
900	44	922	3.072	12.038	0,014531044	0,082943505
	72	878	3.144	12.916	0,0234375	0,072935704
	74	806	3.218	13.722	0,023536896	0,062403221
	58	732	3.276	14.454	0,018023617	0,053344993
	56	674	3.332	15.128	0,017094017	0,04663069
	93	618	3.425	15.746	0,027911164	0,040851401

Table 29: Regression of Short sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,969848
R Square	0,9406051
Adjusted R Square	0,9386253
Standart Error	0,055694
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	1,473657164	1,473657	475,09395	6,004E-20
Residual	30	0,093054679	0,003102		
Total	31	1,566711843			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,0199764	0,011233494	1,778293	0,0854934	-0,0029654	0,0429183
X1 variable	0,5623454	0,025799626	21,79665	6,004E-20	0,50965555	0,61503529

According to the results in Table 29, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a high degree of relationship between variables ($R = 0.96$). The specificity coefficient R2 is found to be 0.94, and it can be said that 94% of the changes in sales depend on the change in inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,56 branche in sales

Table 30: Results of T-Test on Sales of Gordion Short Product

	New sales	*Old sales*
Mean	120,2333	109,303
Variance	1296,325	1071,343
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	19,18337	
P(T<=t) one tail	2,05E-19	
t critical one tail	1,693889	
P(T<=t) two tail	4,1E-19	
t critical two tail	2,036933	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.4. IST Akbatı Stores

In Akbati ’s stores 5 products are examined.First relationship between sales and inventory level are observed.Then inventory level is increased to see if number of unit sold give reaction to change of inventory level.

4.4.1.Sock Product.

Inventory level and sales numbers are shown by table 31 for socks products for Akbati ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 31: Akbati store's sock's sales and Inventory level.

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
1.000	62	100	62	100		
	115	1.038	177	1.138	1,85483871	10,38
	79	923	256	2.061	0,446327684	0,811072056
	82	844	338	2.905	0,3203125	0,409509947
	146	762	484	3.667	0,431952663	0,262306368
	97	616	581	4.283	0,200413223	0,167984729
	99	519	680	4.802	0,170395869	0,121176745
	125	420	805	5.222	0,183823529	0,087463557
	36	295	841	5.517	0,044720497	0,056491766
	94	259	935	5.776	0,1117717	0,046945804
	45	165	980	5.941	0,048128342	0,028566482
	19	120	999	6.061	0,019387755	0,02019862
1.000	74	101	1.073	6.162	0,074074074	0,016663917
	99	1.027	1.172	7.189	0,092264678	0,166666667
	117	928	1.289	8.117	0,099829352	0,129086104
	78	811	1.367	8.928	0,060512025	0,099913761
	85	733	1.452	9.661	0,062179956	0,082101254
	62	648	1.514	10.309	0,042699725	0,067073802
	10	586	1.524	10.895	0,00660502	0,056843535
2.100	55	576	1.579	11.471	0,036089239	0,052868288
	83	2.621	1.662	14.092	0,052564915	0,228489234
	58	2.538	1.720	16.630	0,034897714	0,180102186
	101	2.480	1.821	19.110	0,05872093	0,149128082
	86	2.379	1.907	21.489	0,047226798	0,124489796
	58	2.293	1.965	23.782	0,030414263	0,106705756
	115	2.235	2.080	26.017	0,058524173	0,093978639
	98	2.120	2.178	28.137	0,047115385	0,081485183
	37	2.022	2.215	30.159	0,016988062	0,071862672
	77	1.985	2.292	32.144	0,03476298	0,065817832
	112	1.908	2.404	34.052	0,04886562	0,059357889
	221	1.796	2.625	35.848	0,091930116	0,052742864
4.100	289	1.575	2.914	37.423	0,110095238	0,043935505
	115	5.386	3.029	42.809	0,039464653	0,143922187

Table 32: Regression of Sock sales change % and Inventory level change %

Regression Statistics	
Multiple R	0,96089129
R Square	0,923312071
Adjusted R Square	0,920755807
Standart Error	0,092560415
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	3,094520383	3,0945	361,1959	2,798E-18
Residual	30	0,257022914	0,0086		
Total	31	3,351543297			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,076985505	0,016876759	4,5616	8,01E-05	0,0425186	0,11145244
X1 variable	0,173824384	0,009146171	19,005	2,8E-18	0,1551454	0,19250336

According to the results in Table 32, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a high degree of relationship between variables ($R = 0.96$). The specificity coefficient R2 is found to be 0.92, and it can be said that 92% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,17 branche in sales

Table 33: Results of T-Test on Sales of Akbati Sock Product

	New sales	*Old sales*
Mean	98,19697	91,78788
Variance	2663,2516	2793,547
Observation	33	33
Pearson Correlation	0,1423044	
Hypothesized Mean	0	
df	32	
t Stat	0,5381552	
P(T<=t) one tail	0,2970968	
t critical one tail	1,6938887	
P(T<=t) two tail	0,5941936	
t critical two tail	2,0369333	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.4.2 Shoes Product

Inventory level and sales numbers are shown by table 34 for socks products for Akbati ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 34: Akbati store's shoe's sales and Inventory level.

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	50	211	50	211		
	38	161	88	372	0,76	0,763033175
10	49	123	137	495	0,556818182	0,330645161
	70	84	207	579	0,510948905	0,16969697
120	36	14	243	593	0,173913043	0,02417962
180	25	98	268	691	0,102880658	0,165261383
	40	253	308	944	0,149253731	0,366136035
	72	213	380	1.157	0,233766234	0,225635593
35	96	141	476	1.298	0,252631579	0,121866897
	64	80	540	1.378	0,134453782	0,061633282
177	64	16	604	1.394	0,118518519	0,01161103
80	67	129	671	1.523	0,110927152	0,092539455
45	83	142	754	1.665	0,123695976	0,093237032
60	80	104	834	1.769	0,106100796	0,062462462
220	83	84	917	1.853	0,099520384	0,047484454
	146	221	1.063	2.074	0,159214831	0,119266055
255	66	75	1.129	2.149	0,062088429	0,036162006
	105	264	1.234	2.413	0,093002657	0,122847836
170	119	159	1.353	2.572	0,09643436	0,065893079
	177	210	1.530	2.782	0,130820399	0,081648523
250	92	33	1.622	2.815	0,060130719	0,01186197
350	171	191	1.793	3.006	0,105425401	0,067850799
	78	370	1.871	3.376	0,04350251	0,123087159
	43	292	1.914	3.668	0,022982362	0,086492891
	54	249	1.968	3.917	0,028213166	0,067884406
350	73	195	2.041	4.112	0,037093496	0,049782997
	109	472	2.150	4.584	0,053405194	0,114785992
	135	363	2.285	4.947	0,062790698	0,079188482
250	94	228	2.379	5.175	0,041137856	0,046088539
	53	384	2.432	5.559	0,022278268	0,074202899
10	52	331	2.484	5.890	0,021381579	0,059543083
	40	289	2.524	6.179	0,01610306	0,049066214
100	47	249	2.571	6.428	0,018621236	0,040297783

Table 35: Regression of Shoe sales change % and Inventory level change

Regression Statistics	
Multiple R	0,811282616
R Square	0,658179483
Adjusted R Square	0,646785466
Standart Error	0,09954814
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	0,572445	0,572445	57,765358	1,7814E-08
Residual	30	0,297295	0,00991		
Total	31	0,86974			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,026511999	0,0231539	1,145034	0,2612483	-0,0207746	0,07379858
X1 variable	0,955185241	0,1256764	7,600352	1,781E-08	0,69851971	1,21185077

According to the results in Table 35, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a high degree of relationship between variables ($R = 0.81$). The specificity coefficient R2 is found to be 0.65, and it can be said that 65% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,95 branche in sales

Table 36: Results of T-Test on Sales of Akbati Shoe Product

	New sales	*Old sales*
Mean	101,2818182	77,909091
Variance	2432,265284	1439,2102
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	11,79730991	
P(T<=t) one tail	1,71507E-13	
t critical one tail	1,693888748	
P(T<=t) two tail	3,43014E-13	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.4.3 T-shirt Product

Inventory level and sales numbers are shown by table 37 for T-shirt products for Akbati ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 37: Akbati store's T-shirt sales and Inventory level.

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	82	114	82	114		
240	107	32	189	146	1,304878049	0,280701754
240	112	165	301	311	0,592592593	1,130136986
	100	293	401	604	0,332225914	0,942122186
	116	193	517	797	0,289276808	0,319536424
480	142	77	659	874	0,274661509	0,096612296
	151	415	810	1.289	0,229135053	0,474828375
	232	264	1.042	1.553	0,286419753	0,20480993
960	126	32	1.168	1.585	0,120921305	0,02060528
	162	866	1.330	2.451	0,13869863	0,54637224
	148	704	1.478	3.155	0,111278195	0,287229702
	139	556	1.617	3.711	0,094046008	0,176228209
	101	417	1.718	4.128	0,062461348	0,112368634
480	139	316	1.857	4.444	0,080908033	0,076550388
	206	657	2.063	5.101	0,11093161	0,147839784
	115	451	2.178	5.552	0,055744062	0,088414036
	161	336	2.339	5.888	0,073921028	0,060518732
	132	175	2.471	6.063	0,056434374	0,029721467
480	134	43	2.605	6.106	0,054229057	0,007092199
320	135	389	2.740	6.495	0,051823417	0,063707828
	103	574	2.843	7.069	0,037591241	0,088375674
	108	471	2.951	7.540	0,037988041	0,066628943
	68	363	3.019	7.903	0,023043036	0,048143236
	55	295	3.074	8.198	0,018217953	0,037327597
	98	240	3.172	8.438	0,031880286	0,029275433
	67	142	3.239	8.580	0,02112232	0,016828632
240	62	75	3.301	8.655	0,01914171	0,008741259
	91	253	3.392	8.908	0,027567404	0,029231658
188	58	162	3.450	9.070	0,017099057	0,0181859
	80	292	3.530	9.362	0,023188406	0,032194046
	67	212	3.597	9.574	0,01898017	0,022644734
	85	145	3.682	9.719	0,023630803	0,015145185
	45	60	3.727	9.779	0,012221619	0,006173475

Table 38: Regression of Sock sales change % and Inventory level change

Regression Statistics	
Multiple R	0,505563207
R Square	0,255594157
Adjusted R Square	0,230780629
Standart Error	0,216603041
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	0,483271854	0,4832719	10,3006	0,0031606
Residual	30	1,407506324	0,0469169		
Total	31	1,890778178			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,063916613	0,045832467	1,3945706	0,17339	-0,029686	0,157519
X1 variable	0,471697544	0,146971259	3,2094543	0,00316	0,1715422	0,7718529

According to the results in Table 38, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.50$). The specificity coefficient R2 is found to be 0.25, and it can be said that 25% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,47 branche in sales

Table 39: Results of T-Test on Sales of Akbati T-shirt Product

	New sales	*Old sales*
Mean	146,8212121	112,93939
Variance	3049,070473	1804,1837
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	15,27432559	
P(T<=t) one tail	1,49138E-16	
t critical one tail	1,693888748	
P(T<=t) two tail	2,98277E-16	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.4.4 Hoodie Product

Inventory level and sales numbers are shown by table 40 for Hoodie products for Akbati ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 40 Akbati store's Hoodie sales and Inventory level.

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	51	188	51	188		
30	76	137	127	325	1,490196078	0,728723404
300	36	91	163	416	0,283464567	0,28
	60	355	223	771	0,36809816	0,853365385
	55	295	278	1.066	0,246636771	0,382619974
	83	240	361	1.306	0,298561151	0,225140713
540	108	157	469	1.463	0,299168975	0,120214395
	115	589	584	2.052	0,245202559	0,402597403
	103	474	687	2.526	0,176369863	0,230994152
	128	371	815	2.897	0,186317322	0,146872526
600	160	243	975	3.140	0,196319018	0,083879876
300	151	683	1.126	3.823	0,154871795	0,217515924
	115	832	1.241	4.655	0,102131439	0,217630133
300	111	717	1.352	5.372	0,089443997	0,154027927
	142	906	1.494	6.278	0,105029586	0,168652271
	151	764	1.645	7.042	0,10107095	0,121694807
	173	613	1.818	7.655	0,105167173	0,087049134
	131	440	1.949	8.095	0,072057206	0,057478772
480	124	309	2.073	8.404	0,06362237	0,038171711
	136	665	2.209	9.069	0,065605403	0,079128986
	92	529	2.301	9.598	0,041647804	0,058330577
600	108	437	2.409	10.035	0,046936115	0,045530319
	70	929	2.479	10.964	0,0290577	0,092575984
	67	859	2.546	11.823	0,027027027	0,078347318
	128	792	2.674	12.615	0,050274941	0,066988074
	94	664	2.768	13.279	0,035153328	0,052635751
	105	570	2.873	13.849	0,037933526	0,042924919
	119	465	2.992	14.314	0,041420118	0,033576432
	106	346	3.098	14.660	0,035427807	0,024172139
	110	240	3.208	14.900	0,035506779	0,016371078
	56	130	3.264	15.030	0,017456359	0,008724832
	20	74	3.284	15.104	0,006127451	0,004923486
	18	54	3.302	15.158	0,005481121	0,003575212

Table 41: Regression of Hoodie sales change % and Inventory level change

Regression Statistics	
Multiple R	0,74677257
R Square	0,557669271
Adjusted R Square	0,542924913
Standart Error	0,177811737
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	1,195836236	1,1958362	37,8226	9,174E-07
Residual	30	0,948510419	0,031617		
Total	31	2,144346655			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*
Intercept	-0,002831622	0,040898301	-0,069236	0,94526	-0,086357
X1 variable	1,004871317	0,163393592	6,1500044	9,2E-07	0,6711771

According to the results in Table 41, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.74$). The specificity coefficient R2 is found to be 0.55, and it can be said that 55% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 1,004 branche in sales

Table 42: Results of T-Test on Sales of Akbati Hoodie Product

	New sales	*Old sales*
Mean	193,15758	100,061
Variance	4745,4719	1551,93
Observation	33	33
Pearson Correlation	0,4214779	
Hypothesized Mean	0	
df	32	
t Stat	8,4456123	
P(T<=t) one tail	5,953E-10	
t critical one tail	1,6938887	
P(T<=t) two tail	1,191E-09	
t critical two tail	2,0369333	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.4.5 Short Product

Inventory level and sales numbers are shown by table 43 for Short products for Akbati ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 43: Akbati store's Short sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	60	178	60	178		
	125	188	185	366	2,083333333	1,056179775
186	113	63	298	429	0,610810811	0,172131148
	114	136	412	565	0,382550336	0,317016317
404	95	22	507	587	0,230582524	0,038938053
160	109	331	616	918	0,214990138	0,563884157
102	120	382	736	1.300	0,194805195	0,416122004
	121	364	857	1.664	0,164402174	0,28
300	80	243	937	1.907	0,093348891	0,146033654
	196	463	1.133	2.370	0,209178228	0,242789722
281	76	267	1.209	2.637	0,067078553	0,112658228
	40	472	1.249	3.109	0,033085194	0,178991278
	27	432	1.276	3.541	0,021617294	0,138951431
	42	405	1.318	3.946	0,032915361	0,11437447
400	108	363	1.426	4.309	0,081942337	0,091991891
410	240	655	1.666	4.964	0,168302945	0,152007426
	117	825	1.783	5.789	0,070228091	0,166196616
	89	708	1.872	6.497	0,049915872	0,122300916
	123	619	1.995	7.116	0,065705128	0,095274742
108	122	496	2.117	7.612	0,061152882	0,06970208
	163	482	2.280	8.094	0,076995749	0,063321072
	97	319	2.377	8.413	0,04254386	0,03941191
300	39	222	2.416	8.635	0,016407236	0,026387733
	107	483	2.523	9.118	0,044288079	0,055935148
300	95	376	2.618	9.494	0,037653587	0,041237113
	93	581	2.711	10.075	0,0355233	0,061196545
280	80	488	2.791	10.563	0,029509406	0,048436725
	114	688	2.905	11.251	0,040845575	0,065133011
	91	574	2.996	11.825	0,031325301	0,051017687
	107	483	3.103	12.308	0,035714286	0,040845666
	100	376	3.203	12.684	0,032226877	0,030549236
	101	276	3.304	12.960	0,031532938	0,021759697
	93	175	3.397	13.135	0,0281477	0,013503086

Table 44: Regression of Short sales change % and Inventory level change

Regression Statistics	
Multiple R	0,85638887
R Square	0,7334019
Adjusted R Square	0,7245153
Standart Error	0,19480774
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	3,131977733	3,1319777	82,5289	4,075E-10
Residual	30	1,138501694	0,0379501		
Total	31	4,270479427			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,07822091	0,043702102	-1,789866	0,08357	-0,167473	0,01103069
X1 variable	1,55369397	0,171026087	9,0845437	4,1E-10	1,2044121	1,90297583

According to the results in Table 44, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.85$). The specificity coefficient R2 is found to be 0.73, and it can be said that 73% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 1,55 branche in sales

Table 45: Results of T-Test on Sales of Akbati Short Product

	New sales	*Old sales*
Mean	175,2666667	102,93939
Variance	7121,736667	1731,9337
Observation	33	33
Pearson Correlation	-0,105923929	
Hypothesized Mean	0	
df	32	
t Stat	4,241073186	
P(T<=t) one tail	8,85491E-05	
t critical one tail	1,693888748	
P(T<=t) two tail	0,000177098	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.5. Gant Sanko Park Stores

In Sanko ’s stores 5 products are examined.First relationship between sales and inventory level are observed.Then inventory level is increased to see if number of unit sold give reaction to change of inventory level.

4.5.1.Sock Product.

Inventory level and sales numbers are shown by table 46 for socks products for Sanko ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 46: Sanko's sock's sales and Inventory level.

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
220	38	120	38	120		
	93	302	131	422	2,447368421	2,516666667
300	46	209	177	631	0,351145038	0,495260664
	41	463	218	1.094	0,231638418	0,733755943
	45	422	263	1.516	0,206422018	0,385740402
	98	377	361	1.893	0,372623574	0,248680739
400	116	279	477	2.172	0,32132964	0,147385103
	100	188	577	2.360	0,209643606	0,086556169
500	110	88	687	2.448	0,190641248	0,037288136
	103	478	790	2.926	0,14992722	0,195261438
	80	375	870	3.301	0,101265823	0,128161312
	139	295	1.009	3.596	0,159770115	0,089366859
	59	156	1.068	3.752	0,058473736	0,043381535
500	96	97	1.164	3.849	0,08988764	0,025852878
	103	501	1.267	4.350	0,088487973	0,130163679
	77	398	1.344	4.748	0,060773481	0,091494253
	49	321	1.393	5.069	0,036458333	0,067607414
	58	272	1.451	5.341	0,041636755	0,053659499
	48	214	1.499	5.555	0,033080634	0,040067403
	94	166	1.593	5.721	0,062708472	0,029882988
400	25	72	1.618	5.793	0,01569366	0,012585212
	66	447	1.684	6.240	0,0407911	0,077162092
	60	381	1.744	6.621	0,035629454	0,061057692
	55	321	1.799	6.942	0,031536697	0,048482102
	30	266	1.829	7.208	0,016675931	0,038317488
	20	236	1.849	7.444	0,010934937	0,032741398
	33	216	1.882	7.660	0,017847485	0,029016658
	24	183	1.906	7.843	0,012752391	0,023890339
	38	159	1.944	8.002	0,019937041	0,020272855
	46	121	1.990	8.123	0,023662551	0,01512122
	26	75	2.016	8.198	0,013065327	0,009233042
	45	49	2.061	8.247	0,022321429	0,005977068
	31	4	2.092	8.251	0,015041242	0,000485025

Table 47: Regression of Sock sales change % and Inventory level change

Regression Statistics	
Multiple R	0,967679898
R Square	0,936404384
Adjusted R Square	0,934284531
Standart Error	0,109790895
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	5,324639046	5,325	441,731	1,6769E-19
Residual	30	0,361621222	0,012		
Total	31	5,686260268			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*
Intercept	0,002517493	0,02100858	0,12	0,90542	-0,0403878
X1 variable	0,913528054	0,043465345	21,02	1,7E-19	0,82475998

According to the results in Table 47, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.96$). The specificity coefficient R2 is found to be 0.93, and it can be said that 93% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,91 branche in sales

Table 48: Results of T-Test on Sales of Sanko Sock Product

	New sales	*Old sales*
Mean	69,73333333	63,39394
Variance	1237,144792	1022,434
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	11,3890403	
P(T<=t) one tail	4,28869E-13	
t critical one tail	1,693888748	
P(T<=t) two tail	8,57737E-13	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

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4.5.2.Shoes Product.

Inventory level and sales numbers are shown by table 49 for socks products for Sanko ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 49: Sanko's Shoes's sales and Inventory level.

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	11	50	11	50		
	29	39	40	89	2,636363636	0,78
	9	10	49	99	0,225	0,112359551
	5	151	54	250	0,102040816	1,525252525
	9	146	63	396	0,166666667	0,584
	92	137	155	533	1,46031746	0,345959596
	112	45	267	578	0,722580645	0,084427767
	159	188	426	766	0,595505618	0,325259516
500	131	529	557	1.295	0,307511737	0,690600522
	105	398	662	1.693	0,188509874	0,307335907
	100	793	762	2.486	0,151057402	0,468399291
	76	693	838	3.179	0,099737533	0,278761062
	100	617	938	3.796	0,119331742	0,194086191
	97	517	1.035	4.313	0,103411514	0,136195996
400	111	420	1.146	4.733	0,107246377	0,097380014
	94	309	1.240	5.042	0,082024433	0,065286288
	45	615	1.285	5.657	0,036290323	0,121975407
	34	570	1.319	6.227	0,026459144	0,10076012
	45	536	1.364	6.763	0,034116755	0,086076762
	38	491	1.402	7.254	0,027859238	0,072600917
	131	453	1.533	7.707	0,093437946	0,062448304
	39	322	1.572	8.029	0,025440313	0,0417802
500	53	283	1.625	8.312	0,033715013	0,035247229
	12	230	1.637	8.542	0,007384615	0,027670837
	21	718	1.658	9.260	0,012828345	0,084055256
	23	697	1.681	9.957	0,013872135	0,075269978
	19	674	1.700	10.631	0,011302796	0,067691072
	21	655	1.721	11.286	0,012352941	0,061612266
	26	634	1.747	11.920	0,015107496	0,056175793
	19	608	1.766	12.528	0,010875787	0,051006711
	17	589	1.783	13.117	0,009626274	0,047014687
	19	572	1.802	13.689	0,010656197	0,043607532
	2	553	1.804	14.242	0,001109878	0,040397399

Table 50: Regression of Shoe sales change % and Inventory level change

Regression Statistics	
Multiple R	0,376371592
R Square	0,141655576
Adjusted R Square	0,113044095
Standart Error	0,291760659
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	0,421450719	0,421451	4,951	0,03374183
Residual	30	2,553728462	0,085124		
Total	31	2,975179181			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,169229574	0,056574032	2,991294	0,00551	0,05368999	0,28476916
X1 variable	0,222202143	0,099862303	2,225085	0,03374	0,01825611	0,42614817

According to the results in Table 50, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.37$). The specificity coefficient R2 is found to be 0.14, and it can be said that 14% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,22 branche in sales

Table 51: Results of T-Test on Sales of SankoShoe Product

	New sales	*Old sales*
Mean	109,3333333	54,66666667
Variance	8136,916667	2034,229167
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	6,962731128	
P(T<=t) one tail	3,45424E-08	
t critical one tail	1,693888748	
P(T<=t) two tail	6,90848E-08	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.5.3.T-shirt Product.

Inventory level and sales numbers are shown by table 52 for T-shirt product for Sanko Park‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week

Table 52: Sanko's T-shirt's Sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	27	50	27	50		
60	41	23	68	73	1,518518519	0,46
60	30	42	98	115	0,441176471	0,575342466
	57	72	155	187	0,581632653	0,626086957
180	49	15	204	202	0,316129032	0,080213904
	55	146	259	348	0,269607843	0,722772277
150	74	91	333	439	0,285714286	0,261494253
	76	188	409	627	0,228228228	0,428246014
420	72	112	481	739	0,17603912	0,178628389
	57	460	538	1.199	0,118503119	0,622462788
	99	403	637	1.602	0,18401487	0,336113428
150	80	304	717	1.906	0,125588697	0,189762797
	101	374	818	2.280	0,140864714	0,196222455
210	81	273	899	2.553	0,099022005	0,119736842
	100	402	999	2.955	0,111234705	0,15746181
	91	302	1.090	3.257	0,091091091	0,102199662
	73	211	1.163	3.468	0,066972477	0,064783543
	66	138	1.229	3.606	0,056749785	0,039792388
240	74	72	1.303	3.678	0,060211554	0,019966722
150	74	238	1.377	3.916	0,056792018	0,064709081
300	72	314	1.449	4.230	0,052287582	0,080183861
	62	542	1.511	4.772	0,04278813	0,128132388
	55	480	1.566	5.252	0,036399735	0,100586756
	54	425	1.620	5.677	0,034482759	0,080921554
	57	371	1.677	6.048	0,035185185	0,065351418
	37	314	1.714	6.362	0,022063208	0,051917989
	37	277	1.751	6.639	0,021586931	0,043539767
	61	240	1.812	6.879	0,034837236	0,036150023
240	60	179	1.872	7.058	0,033112583	0,026021224
	41	359	1.913	7.417	0,021901709	0,050864267
	64	318	1.977	7.735	0,033455306	0,042874478
	49	254	2.026	7.989	0,024785028	0,03283775
	25	205	2.051	8.194	0,012339585	0,025660283

Table 53: Regression of T-shirt sales change % and Inventory level change

Regression Statistics	
Multiple R	0,561946917
R Square	0,315784338
Adjusted R Square	0,292977149
Standart Error	0,235407126
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	0,767287351	0,767287	13,8458	0,00081695
Residual	30	1,662495444	0,055417		
Total	31	2,429782795			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,022870845	0,056790374	0,402724	0,69001	-0,0931106	0,13885226
X1 variable	0,765499982	0,205724384	3,720998	0,00082	0,34535474	1,18564522

According to the results in Table 53, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.56$). The specificity coefficient R2 is found to be 0.31, and it can be said that 31% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,76 branche in sales

Table 54: Results of T-Test on Sales of Sanko T-shirt Product

	New sales	*Old sales*
Mean	118,087879	62,1515
Variance	1484,41422	411,195
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	17,6069746	
P(T<=t) one tail	2,5283E-18	
t critical one tail	1,69388875	
P(T<=t) two tail	5,0567E-18	
t critical two tail	2,03693334	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.5.4.Hoodie Product.

Inventory level and sales numbers are shown by table 55 for Hoodie product for Sanko Park‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week

Table 55: Sanko's Hoodie's Sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	74	128	74	128		
91	83	54	157	182	1,121621622	0,421875
400	25	62	182	244	0,159235669	0,340659341
	167	437	349	681	0,917582418	1,790983607
	90	270	439	951	0,257879656	0,396475771
	147	180	586	1.131	0,334851936	0,189274448
390	143	33	729	1.164	0,244027304	0,029177719
500	180	188	909	1.352	0,24691358	0,161512027
	166	508	1.075	1.860	0,182618262	0,375739645
	84	342	1.159	2.202	0,078139535	0,183870968
	77	258	1.236	2.460	0,066436583	0,117166213
	77	181	1.313	2.641	0,062297735	0,073577236
	34	104	1.347	2.745	0,025894897	0,039379023
400	25	70	1.372	2.815	0,018559762	0,025500911
	64	445	1.436	3.260	0,04664723	0,158081705
	82	381	1.518	3.641	0,057103064	0,116871166
	99	299	1.617	3.940	0,065217391	0,082120297
	53	200	1.670	4.140	0,032776747	0,050761421
300	69	147	1.739	4.287	0,041317365	0,035507246
	55	378	1.794	4.665	0,031627372	0,088173548
	53	323	1.847	4.988	0,029542921	0,069239014
	70	270	1.917	5.258	0,037899296	0,054129912
	63	200	1.980	5.458	0,03286385	0,038037277
	66	137	2.046	5.595	0,033333333	0,02510077
400	72	71	2.118	5.666	0,035190616	0,012689902
	140	399	2.258	6.065	0,066100094	0,070420049
191	89	259	2.347	6.324	0,039415412	0,04270404
	92	361	2.439	6.685	0,039198977	0,057084124
	93	269	2.532	6.954	0,038130381	0,040239342
	74	176	2.606	7.130	0,029225908	0,025309175
380	67	102	2.673	7.232	0,0257099	0,01430575
	24	415	2.697	7.647	0,008978676	0,05738385
	43	391	2.740	8.038	0,015943641	0,051131163

Table 56: Regression of Hoodie sales change % and Inventory level change

Regression Statistics	
Multiple R	0,738215109
R Square	0,544961547
Adjusted R Square	0,529793598
Standart Error	0,16940806
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	1,031115114	1,03111511	35,9285	1,4177E-06
Residual	30	0,860972723	0,02869909		
Total	31	1,892087837			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,044564363	0,033776579	1,31938652	0,19702	-0,0244166	0,11354534
X1 variable	0,572400806	0,095495021	5,99403821	1,4E-06	0,37737395	0,76742766

According to the results in Table 56, there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.73$). The specificity coefficient R2 is found to be 0.54, and it can be said that 54% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,57 branche in sales

Table 57: Results of T-Test on Sales of Sanko Hoodie Product

	New sales	*Old sales*
Mean	124,5454545	83,030303
Variance	3771,771307	1676,3428
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	11,64963117	
P(T<=t) one tail	2,38366E-13	
t critical one tail	1,693888748	
P(T<=t) two tail	4,76733E-13	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.5.5.Short Product

Inventory level and sales numbers are shown by table 58 for Short product for Sanko Park‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week

Table 58: Sanko's Short's Sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	21	91	21	91		
	50	70	71	161	2,380952381	0,769230769
100	36	20	107	181	0,507042254	0,124223602
	37	84	144	265	0,345794393	0,464088398
100	45	47	189	312	0,3125	0,177358491
	96	102	285	414	0,507936508	0,326923077
300	116	6	401	420	0,407017544	0,014492754
300	99	188	500	608	0,246882793	0,447619048
	93	389	593	997	0,186	0,639802632
	73	296	666	1.293	0,123102867	0,296890672
200	79	223	745	1.516	0,118618619	0,172467131
	62	344	807	1.860	0,083221477	0,226912929
	46	282	853	2.142	0,057001239	0,151612903
	56	236	909	2.378	0,065650645	0,110177404
	62	180	971	2.558	0,068206821	0,07569386
200	85	118	1.056	2.676	0,08753862	0,046129789
	78	233	1.134	2.909	0,073863636	0,087070254
	133	155	1.267	3.064	0,117283951	0,053282915
300	61	22	1.328	3.086	0,048145225	0,007180157
150	90	261	1.418	3.347	0,067771084	0,084575502
200	122	321	1.540	3.668	0,086036671	0,095906782
	129	399	1.669	4.067	0,083766234	0,108778626
	133	270	1.802	4.337	0,079688436	0,066388001
	70	137	1.872	4.474	0,038845727	0,031588656
200	51	67	1.923	4.541	0,02724359	0,014975414
	36	216	1.959	4.757	0,018720749	0,047566615
	30	180	1.989	4.937	0,015313936	0,037838974
	62	150	2.051	5.087	0,031171443	0,030382824
247	88	88	2.139	5.175	0,0429059	0,017298997
	25	247	2.164	5.422	0,011687705	0,047729469
	29	222	2.193	5.644	0,013401109	0,040944301
	55	193	2.248	5.837	0,025079799	0,034195606
	51	138	2.299	5.975	0,022686833	0,023642282

Table 59: Regression of Short sales change % and Inventory level change

Regression Statistics	
Multiple R	0,691241123
R Square	0,47781429
Adjusted R Square	0,460408099
Standart Error	0,310301084
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	2,643151097	2,6431511	27,4508	1,185E-05
Residual	30	2,888602881	0,09628676		
Total	31	5,531753978			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,039577264	0,071037053	-0,5571355	0,58157	-0,1846543	0,10549975
X1 variable	1,552965119	0,296403958	5,23935351	1,2E-05	0,94762748	2,15830276

According to the results in Table 59 there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.69$). The specificity coefficient R2 is found to be 0.47, and it can be said that 47% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 1,55 branche in sales

Table 60: Results of T-Test on Sales of Sanko Short Product

	New sales	*Old sales*
Mean	111,4666667	69,6666667
Variance	2680,746667	1047,16667
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	12,36727724	
P(T<=t) one tail	4,93296E-14	
t critical one tail	1,693888748	
P(T<=t) two tail	9,86592E-14	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.6. Ist Forum Stores

In Forum ’s stores 5 products are examined.First relationship between sales and inventory level are observed.Then inventory level is increased to see if number of unit sold give reaction to change of inventory level.

4.6.1.Sock Product.

Inventory level and sales numbers are shown by table 61 for socks products for Sanko ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 61: Forum's Sock's Sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	26	101	26	101		
60	75	75	101	176	2,884615385	0,742574257
170	26	60	127	236	0,257425743	0,340909091
	57	204	184	440	0,448818898	0,86440678
	37	147	221	587	0,201086957	0,334090909
	101	110	322	697	0,457013575	0,187393526
400	94	9	416	706	0,291925466	0,012912482
	106	315	522	1.021	0,254807692	0,446175637
400	69	209	591	1.230	0,132183908	0,204701273
	122	540	713	1.770	0,20642978	0,43902439
	70	418	783	2.188	0,098176718	0,236158192
	55	348	838	2.536	0,070242656	0,15904936
100	85	293	923	2.829	0,101431981	0,115536278
	77	308	1.000	3.137	0,083423619	0,108872393
	86	231	1.086	3.368	0,086	0,073637233
300	79	145	1.165	3.513	0,072744015	0,043052257
	33	366	1.198	3.879	0,02832618	0,104184458
	36	333	1.234	4.212	0,030050083	0,085846868
	54	297	1.288	4.509	0,04376013	0,070512821
	48	243	1.336	4.752	0,037267081	0,053892216
	34	195	1.370	4.947	0,025449102	0,041035354
250	55	161	1.425	5.108	0,040145985	0,032544977
	40	356	1.465	5.464	0,028070175	0,069694597
	30	316	1.495	5.780	0,020477816	0,057833089
100	79	286	1.574	6.066	0,052842809	0,049480969
	33	307	1.607	6.373	0,020965693	0,050609957
250	21	274	1.628	6.647	0,013067828	0,04299388
	47	503	1.675	7.150	0,028869779	0,075673236
	65	456	1.740	7.606	0,03880597	0,063776224
	28	391	1.768	7.997	0,016091954	0,051406784
250	31	363	1.799	8.360	0,017533937	0,045392022
	42	582	1.841	8.942	0,023346304	0,069617225
	27	540	1.868	9.482	0,014665942	0,060389175

Table 62: Regression of Short sales change % and Inventory level change

Regression Statistics	
Multiple R	0,65038582
R Square	0,423001715
Adjusted R Square	0,403768439
Standart Error	0,390673971
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	3,356740855	3,35674086	21,9932	5,588E-05
Residual	30	4,578784542	0,15262615		
Total	31	7,935525397			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,077728935	0,089798876	-0,86558918	0,39359	-0,2611227	0,10566484
X1 variable	1,614996956	0,34437156	4,68969318	5,6E-05	0,91169641	2,31829751

According to the results in Table 62 there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.65$). The specificity coefficient R2 is found to be 0.42, and it can be said that 42% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 1,61 branche in sales

Table 63: Results of T-Test on Sales of Sanko Short Product

	New sales	*Old sales*
Mean	73,58787879	56,60606061
Variance	1226,194223	725,5587121
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	12,07212216	
P(T<=t) one tail	9,3599E-14	
t critical one tail	1,693888748	
P(T<=t) two tail	1,87198E-13	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.5.2.Shoes Product.

Inventory level and sales numbers are shown by table 64 for socks products for Sanko ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 64: Forum's Shoe's Sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	41	80	41	80		
	37	39	78	119	0,902439024	0,4875
150	47	2	125	121	0,602564103	0,016806723
	50	105	175	226	0,4	0,867768595
100	50	55	225	281	0,285714286	0,243362832
	55	105	280	386	0,244444444	0,37366548
100	72	50	352	436	0,257142857	0,129533679
352	86	78	438	514	0,244318182	0,178899083
50	75	344	513	858	0,171232877	0,6692607
	94	319	607	1.177	0,183235867	0,371794872
100	131	225	738	1.402	0,215815486	0,191163976
100	86	194	824	1.596	0,116531165	0,138373752
50	78	208	902	1.804	0,094660194	0,130325815
124	70	180	972	1.984	0,077605322	0,099778271
151	72	234	1.044	2.218	0,074074074	0,117943548
61	107	313	1.151	2.531	0,102490421	0,141118124
50	71	267	1.222	2.798	0,061685491	0,1054919
	47	246	1.269	3.044	0,038461538	0,087919943
	51	199	1.320	3.243	0,040189125	0,065374507
	26	148	1.346	3.391	0,01969697	0,045636756
58	24	122	1.370	3.513	0,017830609	0,035977588
	35	156	1.405	3.669	0,025547445	0,04440649
	41	121	1.446	3.790	0,029181495	0,032979013
	20	80	1.466	3.870	0,013831259	0,021108179
400	55	60	1.521	3.930	0,037517053	0,015503876
	82	405	1.603	4.335	0,0539119	0,103053435
	77	323	1.680	4.658	0,048034934	0,074509804
400	63	246	1.743	4.904	0,0375	0,052812366
	90	583	1.833	5.487	0,051635112	0,118882545
	111	493	1.944	5.980	0,060556465	0,089848733
	117	382	2.061	6.362	0,060185185	0,063879599
	110	265	2.171	6.627	0,053372149	0,041653568
	109	155	2.280	6.782	0,050207278	0,023389166

Table 65: Regression of Shoe sales change % and Inventory level change

Regression Statistics	
Multiple R	0,53236142
R Square	0,28340868
Adjusted R Square	0,25952231
Standart Error	0,1627839
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	0,314402333	0,3144	11,8649	0,00171046
Residual	30	0,794957934	0,0265		
Total	31	1,109360267			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,06245524	0,037632154	1,65962	0,10741	-0,0143999	0,13931035
X1 variable	0,51605937	0,149819463	3,44454	0,00171	0,21008721	0,82203154

According to the results in Table 65 there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.53$). The specificity coefficient R2 is found to be 0.28, and it can be said that 42% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,51 branche in sales

Table 66: Results of T-Test on Sales of Forum Shoe Product

	New sales	*Old sales*
Mean	114,6878788	69,0909
Variance	2314,613598	847,46
Observation	33	33
Pearson Correlation	0,762740824	
Hypothesized Mean	0	
df	32	
t Stat	8,179233653	
P(T<=t) one tail	1,21109E-09	
t critical one tail	1,693888748	
P(T<=t) two tail	2,42218E-09	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.5.3.T-shirt Product

Inventory level and sales numbers are shown by table 67 for socks products for Sanko ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 67: Forum's T-shirt's Sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
	32	96	32	96		
	52	64	84	160	1,625	0,666666667
200	40	12	124	172	0,476190476	0,075
	43	172	167	344	0,346774194	1
	56	129	223	473	0,335329341	0,375
200	109	73	332	546	0,488789238	0,154334038
200	94	164	426	710	0,28313253	0,3003663
	134	270	560	980	0,314553991	0,38028169
300	73	136	633	1.116	0,130357143	0,13877551
	122	363	755	1.479	0,192733017	0,325268817
	93	241	848	1.720	0,123178808	0,162947938
	117	148	965	1.868	0,137971698	0,086046512
600	23	31	988	1.899	0,023834197	0,016595289
	52	608	1.040	2.507	0,052631579	0,32016851
	86	556	1.126	3.063	0,082692308	0,221779019
	97	470	1.223	3.533	0,086145648	0,153444336
	57	373	1.280	3.906	0,046606705	0,105575998
	75	316	1.355	4.222	0,05859375	0,080901178
	57	241	1.412	4.463	0,042066421	0,057081952
	43	184	1.455	4.647	0,030453258	0,041227874
	30	141	1.485	4.788	0,020618557	0,030342156
	76	111	1.561	4.899	0,051178451	0,023182957
	6	35	1.567	4.934	0,00384369	0,007144315
500	4	29	1.571	4.963	0,002552648	0,005877584
	30	525	1.601	5.488	0,019096117	0,105782793
	15	495	1.616	5.983	0,009369144	0,090196793
	17	480	1.633	6.463	0,010519802	0,080227311
	19	463	1.652	6.926	0,011635028	0,071638558
	20	444	1.672	7.370	0,012106538	0,064106266
	19	424	1.691	7.794	0,011363636	0,057530529
	23	405	1.714	8.199	0,013601419	0,051963048
	19	382	1.733	8.581	0,011085181	0,046591048
	41	363	1.774	8.944	0,023658396	0,042302762

Table 68: Regression of Shoe sales change % and Inventory level change

Regression Statistics	
Multiple R	0,615780909
R Square	0,379186128
Adjusted R Square	0,358492332
Standart Error	0,242065143
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	1,073684774	1,07368	18,3237	0,00017568
Residual	30	1,757866002	0,0586		
Total	31	2,831550776			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	0,010585549	0,055027101	0,19237	0,84875	-0,1017948	0,12296588
X1 variable	0,887713868	0,207379997	4,28061	0,00018	0,46418741	1,31124032

According to the results in Table 68 there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.61$). The specificity coefficient R2 is found to be 0.37, and it can be said that 37% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 0,88 branche in sales

Table 69: Results of T-Test on Sales of Forum T-shirt Product

	New sales	*Old sales*
Mean	64,50909091	53,7576
Variance	1890,722727	1313
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	8,522440332	
P(T<=t) one tail	4,85862E-10	
t critical one tail	1,693888748	
P(T<=t) two tail	9,71723E-10	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.5.4.Hoodie Product

Inventory level and sales numbers are shown by table 70 for Hoodie products for Sanko ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 70: Forum's Hoodie's Sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
235	62	96	62	96		
294	234	269	296	365	3,774193548	2,802083333
190	103	329	399	694	0,347972973	0,901369863
	50	416	449	1.110	0,125313283	0,599423631
	36	366	485	1.476	0,080178174	0,32972973
	164	330	649	1.806	0,33814433	0,223577236
454	113	166	762	1.972	0,174114022	0,091915836
416	170	507	932	2.479	0,223097113	0,257099391
	80	753	1.012	3.232	0,08583691	0,303751513
	110	673	1.122	3.905	0,108695652	0,208230198
199	135	563	1.257	4.468	0,120320856	0,144174136
300	107	627	1.364	5.095	0,085123309	0,140331244
	57	820	1.421	5.915	0,041788856	0,1609421
	34	763	1.455	6.678	0,023926812	0,128994083
	60	729	1.515	7.407	0,041237113	0,10916442
	60	669	1.575	8.076	0,03960396	0,090319968
	104	609	1.679	8.685	0,066031746	0,075408618
	102	505	1.781	9.190	0,060750447	0,058146229
	98	403	1.879	9.593	0,055025267	0,043852013
	100	305	1.979	9.898	0,053219798	0,031794016
	77	205	2.056	10.103	0,03890854	0,020711255
	63	128	2.119	10.231	0,030642023	0,012669504
300	102	65	2.221	10.296	0,048135913	0,00635324
	110	263	2.331	10.559	0,04952724	0,025543901
	80	153	2.411	10.712	0,034320034	0,014490009
	22	73	2.433	10.785	0,009124844	0,006814787
700	3	51	2.436	10.836	0,001233046	0,00472879
	144	748	2.580	11.584	0,0591133	0,069029162
	146	604	2.726	12.188	0,056589147	0,052140884
	138	458	2.864	12.646	0,050623624	0,037577946
	122	320	2.986	12.966	0,042597765	0,025304444
300	23	198	3.009	13.164	0,007702612	0,015270708
	110	475	3.119	13.639	0,036556996	0,036083257

Table 71: Regression of Hoodie sales change % and Inventory level change

Regression Statistics	
Multiple R	0,954687003
R Square	0,911427273
Adjusted R Square	0,908474849
Standart Error	0,199047346
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	12,23083327	12,2308	308,705	2,4439E-17
Residual	30	1,188595384	0,03962		
Total	31	13,41942865			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,074736987	0,038439918	-1,9443	0,06129	-0,1532418	0,0037678
X1 variable	1,238252644	0,070475414	17,57	2,4E-17	1,09432265	1,38218264

According to the results in Table 71 there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.95$). The specificity coefficient R2 is found to be 0.91, and it can be said that 91% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 1,23 branche in sales

Table 72: Results of T-Test on Sales of Forum Hoodie Product

	New sales	*Old sales*
Mean	131,64375	94,03125
Variance	4744,272863	2420,547379
Observation	32	32
Pearson Correlation	1	
Hypothesized Mean	0	
df	31	
t Stat	10,81161083	
P(T<=t) one tail	2,40654E-12	
t critical one tail	1,695518783	
P(T<=t) two tail	4,81308E-12	
t critical two tail	2,039513446	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

4.5.5.Short Product

Inventory level and sales numbers are shown by table 73 for Shoe products for Sanko ‘s stores.Datas are obtained week by week.Inventory level is measured at the begining of the week.Sales numbers are the total sales number during that week.

Table 73: Forum's Short's Sales and Inventory level

Order	Sales	Inv.Lvl	Cum.Sales	Cum.Inv.Lvl	Change % sales	Change % Inv lvl
80	42	96	42	96		
80	48	54	90	150	1,142857143	0,5625
	56	86	146	236	0,622222222	0,573333333
120	59	110	205	346	0,404109589	0,466101695
	46	51	251	397	0,224390244	0,147398844
	46	125	297	522	0,183266932	0,314861461
	46	79	343	601	0,154882155	0,151340996
400	49	66	392	667	0,142857143	0,109816972
	48	17	440	684	0,12244898	0,025487256
	52	369	492	1.053	0,118181818	0,539473684
	70	317	562	1.370	0,142276423	0,301044634
	50	247	612	1.617	0,088967972	0,180291971
	46	197	658	1.814	0,075163399	0,12183055
	43	151	701	1.965	0,065349544	0,083241455
200	81	108	782	2.073	0,115549215	0,054961832
200	71	27	853	2.100	0,090792839	0,013024602
	82	156	935	2.256	0,096131301	0,074285714
400	70	274	1.005	2.530	0,07486631	0,121453901
	65	204	1.070	2.734	0,064676617	0,080632411
	77	539	1.147	3.273	0,071962617	0,197147037
	81	462	1.228	3.735	0,070619006	0,141154904
	88	381	1.316	4.116	0,071661238	0,102008032
	77	293	1.393	4.409	0,058510638	0,071185617
	74	216	1.467	4.625	0,053122757	0,048990701
	38	142	1.505	4.767	0,025903204	0,030702703
400	25	104	1.530	4.871	0,016611296	0,021816656
	34	79	1.564	4.950	0,022222222	0,016218436
	80	445	1.644	5.395	0,051150895	0,08989899
120	81	365	1.725	5.760	0,049270073	0,067655236
200	72	284	1.797	6.044	0,04173913	0,049305556
	77	332	1.874	6.376	0,042849193	0,05493051
	80	455	1.954	6.831	0,042689434	0,071361355
	74	375	2.028	7.206	0,037871034	0,054896794

Table 74: Regression of Short sales change % and Inventory level change

Regression Statistics	
Multiple R	0,954687003
R Square	0,911427273
Adjusted R Square	0,908474849
Standart Error	0,199047346
Observations	32

ANOVA

	df	*SS*	*MS*	*F*	*Significance*
Regression	1	12,23083327	12,2308	308,705	2,4439E-17
Residual	30	1,188595384	0,03962		
Total	31	13,41942865			

	Coefficients	*Standart Error*	*t Stat*	*P-Value*	*Lower %95*	*Upper %95*
Intercept	-0,074736987	0,038439918	-1,9443	0,06129	-0,1532418	0,0037678
X1 variable	1,238252644	0,070475414	17,57	2,4E-17	1,09432265	1,38218264

According to the results in Table 74 there is a statistically significant relationship between sales and change of inventory level.($p < 0.05$). There is a relationship between variables ($R = 0.95$). The specificity coefficient R2 is found to be 0.91, and it can be said that 91% of the changes in sales depend on the change in change of inventory level. According to the result of F statistic in which the general significance of the model is evaluated, the model is found to be generally meaningful ($p < 0.05$). When the table is examined, inventory level variables are statistically significant ($p < 0.05$). When the regression equation is examined, it is seen that the 1-branche changes in the stock will cause a change of 1,23 branche in sales

Table 75: Results of T-Test on Sales of Forum Short Product

	New sales	*Old sales*
Mean	86,03636364	61,4545
Variance	578,3336364	295,068
Observation	33	33
Pearson Correlation	1	
Hypothesized Mean	0	
df	32	
t Stat	20,55179647	
P(T<=t) one tail	2,65208E-20	
t critical one tail	1,693888748	
P(T<=t) two tail	5,30416E-20	
t critical two tail	2,036933343	

The value is 0,000. H0 hypothesis is rejected if 0,000 <0,05. And it is decided that there is a meaningful difference between the old sales averages and the new sales averages

As a result of all these analyzes; the following table summarizes whether there is a meaningful difference between the old sales after the stock change and the new sales average:

Table 76: T-Test Results for Stores old sales and new sales

Warehouse Name	Product Name	Significant Difference	No Significant Difference
Adana Optimum	Socks	✔	
	Shoes	✔	
	T-shirt	✔	
	Hoodie	✔	
	Short	✔	
ANK Gordıon	Socks	✔	
	Shoes	✔	
	T-shirt	✔	
	Hoodie	✔	
	Short	✔	
IST Akbatı	Socks	✔	
	Shoes	✔	
	T-shirt	✔	
	Hoodie	✔	
	Short	✔	
Gant Sankopark	Socks	✔	
	Shoes	✔	
	T-shirt	✔	
	Hoodie	✔	
	Short	✔	
IST Forum	Socks	✔	
	Shoes	✔	
	T-shirt	✔	
	Hoodie	✔	
	Short	✔	

Referring to Table 76, it has been determined that there is a meaningful difference between old sales and new sales averages, generally resulting in stock changes.

CONCLUSION

There are many studies in the literature regarding inventory management, the relationship between stocks and sales, and stocks affecting sales. Alper, et al. (2018), the ABC stock analysis method was applied with the intention that the medical consumables and drug stocks of hospitals could be used effectively. The SMS system has been switched to the continuity of the application. The findings of the research are that SMS system is important for materials that appear stocco but not real, and stock analysis and SMS system can prevent negative situations such as loss or leakage which are experienced in stocks. In a study by Dikilitaş and Öztürk (2010), the development of the selling price and amount of wood raw materials was examined through auction sale. As a result, it has been determined that keeping stocks low and determining / decreasing supply according to market demand will be useful in terms of sales. Another study on the subject was carried out by Yüksel and Duran (2017). In this study, drugs are classified by gender using ABC analysis. Survey findings indicate that profitability can be increased if the order quantity is determined at weekly or shorter periods.

In model products are examined very carefully.Products are selected,do not intreact with seasonality.To illustrate Seasonality,prodcut that is ‘cap’ is good example.When sales of cap compare with summer’s months and winter’s months result can be conspicuous.Despite of the difference of inventory level,sale’s number of cap in summer is more than in winter.If stock’s convertaion rate for sale’s of cap is %5 in winter,this ratio go up to %90 in summer.The best explanation of that ,people in summer need cap to avoid sunshie.The products are observed are not given react to seasonality so inventory level can be measured to understand whether it is effective or not on sales.

The shops in model also play as important role as product with nonseasonal..Every shop in model is located different placeses of Turkey.Every shop has also different type of customers.Nowadays in Turkey people’s income can be different.People’s priority also can be changable according to money they make.People who earn minimum wage of course can not attempt to buy those sports product.Shops in our model are choosen according to conversion rate of shopping mal.Every five stores in model has same conversion rate of sales. For example Adana optimum’s conversion rate is %43,77.Ankara Gordion’s conversion rate is %44.01.IST Akbatı’s conversion rate is %43,69.Gant Sanko park’s conversion rate is %44.09.IST Forum’s conversion rate is %43,99

The other thing that is taken into consideration is average price of baskets of one

customer.Because conversion rate only show the ratio of how many people enter the stores and how many of them buy something.In shops price can be variable.There are some products can be bought only 9,99 TL also some of them can be bought 1999,99TL.After considering covertaion rate,average basket price per customer takes significant role.In this 5 stores average basket price is quite similar.For example Adana optimum's average basket price is 223,55 TL.Ankara Gordion's average basket price is 221,44TL.IST Akbatı's average basket price is 224,11 TL.Gant Sanko park's average basket price is 223,22TL.IST Forum'average price is 222,96 TL.Table 79 shows that every store's avarege price per customers.

Table 77:Average basket price for stores.

Months	Adana Optumum	Ank Gordion	Ist Akbatı	Gant Sanko park	Ist Forum
1	218,15	220,59	226,87	214,29	219,68
2	217,28	222,59	210,75	219,92	220,51
3	217,80	215,58	229,35	220,62	207,15
4	224,32	220,09	232,78	214,03	217,98
5	222,87	224,41	224,42	213,44	219,56
6	215,00	222,97	229,26	229,01	215,96
7	216,48	215,82	217,54	226,98	221,23
8	219,89	220,59	219,27	227,75	216,15
9	221,22	218,60	216,98	208,26	220,34
10	215,32	212,67	219,83	220,62	228,96
11	225,57	218,22	213,77	223,25	219,17
12	222,37	213,56	224,93	211,29	221,83
13	220,23	223,31	216,77	212,57	223,84
14	223,85	222,35	219,80	211,27	222,78
15	218,10	218,21	224,92	230,38	220,21
16	213,14	210,89	222,77	210,06	227,36
17	219,85	226,18	223,11	220,12	223,99
18	213,88	214,45	226,89	213,32	222,18
19	217,94	213,64	221,25	213,19	227,31
20	213,06	215,91	218,69	224,33	214,43
21	225,96	213,23	217,89	216,68	231,81
22	227,47	222,30	218,71	218,77	216,40
23	217,74	216,58	218,99	211,93	224,89
24	217,92	227,00	222,34	221,20	214,88

For Adana store's average price basket's kurtosis is -0,722547019 and skewness is 0,315079694. jB test p value is 0,732952 which is higher than p value. Acoording to Jarque-Bera test we assume data is normally distrubeted.

For Ank Gordion store's average price basket's kurtosis is -1,0359 and skewness is0,090474. jB test p value is 0,582376 which is higher than p value. Acoording to Jarque-Bera test we assume data is normally distrubeted.

For IST Akbatı store's average price basket's kurtosis is -0,057190367 and skewness is0,191924213. jB test p value is 0,980147which is higher than p value. Acoording to Jarque-Bera test we assume data is normally distrubeted.

For Gant Sanko park store's average price basket's kurtosis is -0,95172 and skewness is0,416058. jB test p value is 0,583077 which is higher than p value. Acoording to Jarque-Bera test we assume data is normally distrubeted.

For IST Forum store's average price basket's kurtosis is 0,874377786 and skewness is -0,220641648. jB test p value is 0,665904 which is higher than p value. Acoording to Jarque-Bera test we assume data is normally distrubeted.

Table 80 shows us all stores'es avarage basket price is statistically same.F value is 1,86 and F critical value is 2,4. F value is smaller than Critical value,we can assume those groups have same means.

Table 78:ONE WAY ANOVA for avarage basket prices

Summary

Groups	*COUNT*	*SUM*	*AVARAGE*	*VARIANCE*
Adana Optumum	24	5265,425086	219,3927119	16,84837031
Ank Gordion	24	5249,730356	218,7387649	20,67226401
Ist Akbatı	24	5317,866295	221,5777623	27,10442713
Gant Sanko park	24	5233,287107	218,0536295	41,82644799
Ist Forum	24	5298,625929	220,7760804	28,55692806

ANOVA

Variance	*SS*	*df*	*MS*	*F*	*P-Value*	*F crit*
Between Groups	201,9017183	4	50,47542958	1,869343521	0,120540237	2,450571
Within Groups	3105,194062	115	27,0016875			
Total	3307,095781	119				

According to the results of the research, it is observed that there is a statistically significant difference between the old sales average and the new sales average in general. Our analyzes show that there is a high correlation between sales and stocks, and this relationship is generally positive. According to our regression analysis results, one unit increase in inventory level is found to create an effect in increasing sales. Accordingly, quantity of in-store inventories affect sales, positively. As an alternative to the strategies applied to increase sales in this context, it may be shown as a viable option to change the inventory level increase.

REFERENCES

Onwubolu, G. C., & Dube, B. C. (2006). Implementing an Improved Inventory Control System in a Small Company: A Case Study. Production Planning & Control, 17(1), 67-76

Fuerst, W. L. (1981). Small Business Get A New Look at ABC Analysis for Inventory Control. Journal of Small Business Management, 19(3), 39-44.

Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2004). Managing The Supply Chain: The Definitive Guide For The Business Professional. New York: McGraw-Hill

Coyle, J. J., Bardi, E. J., & Langley, C. J. Jr. (2003). The Management of Business Logistic: A Supply Chain Perspective (7th ed.). Mason: South-Western

DEMİR Hulusi ve GÜMÜŞOĞLU Şevkinaz. Üretim/işlemler Yönetimi. İstanbul: Beta Basım Yayım,1994. s.563

DEMİR, Hulusi, GÜMÜŞOĞLU, Şevkinaz "Üretim Yönetimi", 5. Basım, Beta yayınları, İstanbul, 1998

GÜNEÇIKAN, Ökkeş, "Kapasite Planlaması ve Optimum Stok Kontrolü Yönetimi", Kahramanmaraş Sütçü İmam Üniversitesi, Yayınlanmamış Yüksek Lisans Tezi, Kahramanmaraş, 2008

KAYA, Nurullah," Etkin Stok Yönetimi ve Türkiye'de Bir Uygulama", Atatürk Üniversitesi Sosyal Bilimler Enstitüsü, Yayınlanmış Doktora Tezi, Erzurum, 2004

KİRACI, Murat, "Stok Yönetimi ve Karlılık İlişkisinin Finansal Oranlar Aracılığıyla İncelenmesi: İMKB İmalat Sektöründe Bir Araştırma" ODTÜ Geliştime Dergisinde Yayınlanmış Makale, Cilt 36, Sayı 1, Eskişehir, 2009, s.163

KOBU, Bülent , "Üretim Yönetimi", 14. Basım, Beta basım No: 2066, İstanbul, 2008

KÜÇÜK, Orhan, " Stok Yönetimi Ampirik Bir Yaklaşım", 2. Baskı, Seçkin yayınları, Ankara, 2011

MANAP, Gonca, "Paranın Zaman Değeri ve Öğrenme Etkisi Altındaki Kesikli Zaman-Değişken Talepli Parti Büyüklüğü Modelleri" Süleyman Demirel Üniversitesi, Yayınlanmamış Yüksek Lisans Tezi, Isparta, 2003

MUCUK İsmet, Pazarlama İlkeleri, Beşinci Basım, Der Yatınları, İstanbul 1991

ODMAN ÇELİKÇAPA, Feray, "Endüstri İşletmelerinde Üretim Yönetimi ve Teknikleri" 2. Baskı, Vipaş Yayınları, İstanbul, 1994

ÖZDEMİR, Emin, "Stok Kontrol Yöntemleri" Yayımlanmış Yüksek Lisans Tezi, Niğde Üniversitesi Aksaray İktisadi İdari Bilimler Fakültesi, Aksaray, 2002

SAYGILI, İrfan, "Üretim Yönetiminin Fonksiyonları", Küre Ajans, İstanbul, 1991

SEYİDOĞLU, Halil, "Ekonomik Terimler: Ansiklopedik Sözlük", Yayın No: 4, Güzem Yayınları, Ankara, 1992

TANYAŞ Mehmet ve BASKAK Murat, Üretim Planlama ve Kontrol. İstanbul: İrfan Yayımcılık, 2006.

TEKİN, Mahmut, "Üretim Yönetimi" 2.cilt, 6. Baskı, Günay Ofset Yayınları, Konya, 2009

TOP Aykut, Üretim Yönetimi. Ankara: Nobel Yayın Dağıtım, 2006. s.191

TOP, Aykut, " Üretim Sistemleri Analiz, Planlama ve Kontrolü" 3. Baskı, Alfa yayınları, İstanbul, 2001

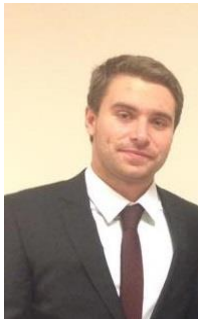
YÜKSEL, Hilmi, "Üretim/ İşlemler Yönetimi", 2. Basım, Yayın No: 1368, Nobel

Yayınları, Ankara, 2010

EYMEN, U. Erman, "Tedarik Zinciri Yönetimi", Kaliteofisi Yayınları No: 14, Şubat 2007, www.kaliteofisi.com (5 Eylül 2008) s. 7

TEK, Ömer Baybars, Retail Marketing Management. İzmir: Üçel Publishing, 1984, p. 680

ULUCAN, Aydın, Operations Research, Business Administration Applied / Computer Aided Modeling. Ankara: Political Bookstore, 2004



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PERSONAL INFORMATION:
• Date of Birth: 10/06/1991Place of Birth: Kırklareli• Marital status: Single
Academic qualifications
Işık University Business Administration and Management, General(2016-2018)
Işık University İndustrial Engineering(İstanbul)(2009-2015)
Borsa Anadolu Highschool (Çorlu/Tekirdağ)(2005-2009)

EXPERIENCE (December 2018- Now)
• Responsible for coordination and planning requirements of the category, and manage purchasing budget.
• Demand planning- forecasting sales for the coming months
• Supply planning- finalizing the supply planning and ordering of stock.
• Responsible for monitoring sales, warehouse stocks, traffic of the category; creating new action plans when necessary.
• Analyze SKU (Stock Keep Unit) performance daily/weekly to optimize & sales
• Minimize end of season stock; decrease replenishment on slow selling items, to increase the sell-through and minimize stock cost
• Responsible for all processes from the arrival of the products to the end of the sales cycle; and be able to analyze & improve these processes.
• Responsible for new campaign banners and product groups that need to be highlighted, creating new campaigns and discounts for products.
• Monitoring and working together with the visual team for the sample processes of photographing.
• Regularly conducting brand / competitor / product analysis, taking action for new trends in the industry.
• Be in communication and coordination with necessary departments (category, sourcing, logistics).

İntersport as Category Supervisior (June 2018-December 2018)

•Developing and implementing the strategy of the category in line with market needs and trends

•The implementation of the new product range- selection of the products and pricing.

•Continuos analysis of the performance of current range and taking the right action plans required

•Handling all supplier relations

•Carrying out daily stock and sales analysis,monitoring and analyzing best sellers•Prepare and adjust weekly reports

•preparing seasonal sales budget for the related product group on category basis and taking responsibility of gross profit target

•Analyzes and reports promotional activity effect on sales quantity,value and margin results versus budget.

•follows up actual sales and margin result versus budget

•Forcasting future sales and deciding on the amount of products order unit based on current stock sales data

•Improves seasonal buying budget process and creates new planning tools to support budget process

Decathlon as Retail Supplier (August.2016- june 2018)

Demand and supply planning and forecasting,Ensuring a solid stock availability rate in warehouse & store.

Selecting the "product range" to be sold in Turkey following trends and market structure.

Execution of country stock monitoring/domestic (re-)allocation of stocks Stock level and stock lifetime, margin and T/O forecast analysis through the use of SAP.

Managing the pricing, stock monitoring, product identity modification, product order flow and availability on a daily basis through SAP

Communicating with domestic producers and international suppliers.

Preparing weekly/-monthly-yearly reports in coordination with commercial team to boost sales in stores.

İndustrıal Enginner at Yünsa(october 2015-june.2016)

- *Planning, implementation and reporting of production related Production System (Lean Manufacturing) tools,*
- *Conducting time measure of production working phases and sub-phases,*
- *Conducting time data acquisition and organization in a structured database,Analysing gaps between theoretical data and manufacturing current data and investigating the causes,*
- *Analysing manufacturing execution methods to increase efficiency and optimize operator workload,To do ergonomy analysis of operations and improve the situation,*
- *Analysing production flow and supporting Lean Manufacturing projects.*

Internship 2 - C.F.Maier Polimer Tek.Ltd.Şti. (Production Department) (Automotive Supply Industry) July 2013 Internship 1 - Yünsa Yünlü San. ve Tic. A.Ş. (Planning Department) july 2012

Computer skills

- *SAP,C++ software known,Knowledge of MS Office tools including MS project, PowerPoint.Minitap*

CERTİFİCATE:

- *İSTANBUL İNSTUTE:PROJECT MANAGEMENT(60 HOURS)*

Project Managment, Project Integration Management, Project Integration Management, Project scope Managment, Project time Managment, Project cost Managment, Project quality Managment, Proect communications Managment, Project risk Managment, Project stakeholder

- *6SİGMA CENTER:GREENBELT(72 HOURS)*

  Lean Production, Lean Production Principles, 7 Fundamental Items of Waste, Lean Production Tools (Lean House) Strategic management (Vision, Mission), Goals, Policies, Corporate Culture, Standardization (5S, Process Management) ,JIT (VSM, KANBAN, SMED), JIDOKA (Poka Yoke, KAIZEN, TPM), Diversity and Sources of Diversity, Definition Phase and Used Techniques, Measurement Phase and Used Techniques, Analysis Phase and Used Techniques, Improvement Phase and Used Techniques, Control Phase and Used Techniques

FOREIGN LANGUAGE :

• English - Good Level (Reading: Advanced, Writing: Advanced Speaking advanced)