TOBACCO PRODUCTS STOCK MANAGEMENT ON THE CASE OF THE RETAIL CHAIN IN THE REPUBLIC OF SERBIA

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Abstract: Companies nowadays have profit as a main goal with optimal costs and other resources. However, how to achieve the optimal costs and resources are the main issue and problem for all companies? Is the way to achieve them the same for all organizations, industries? Of course not, every company organize its business in accordance to the environment and internal needs. This paper are based on tobacco products stocks analysis, data are collected for the retailer operating in the urban, city area in Serbia. In order to complement analysis stock level data for observed tobacco product used in paper, temperature and retail sales data have been collected. Mentioned data collection, analysis and research were implemented in order to set up an adequate model which should be used in the retailer future projections of the stock level and optimization of the costs.

Key words: stock, OOS, distribution, logistic, tobacco products

INTRODUCTION

Internet and technology changed everyday life and environment people live, digitalization and new devices widespread and accessible, all resulting changes in all segments of the society. Logistics systems have been dynamically changing over the past period, the development of new innovative hardware and software solutions will impact their changes in the future. Today's business is characterized by the final consumer, his needs and satisfaction. Therefore, retailer should organize business in such a way to develop a long-term relationship with that consumer and satisfies all his needs and wishes.

The significance of the retailers supply chain and its set up on the proper way are core for the satisfying of the end customer. Well organized supply chain should give opportunity to retailer to operating without out of stocks (OOS) and optimizing costs (transport, inventory, storage etc.). Modern retail systems that operate mainly in several markets, have a problem of organizing the supply chain and achieving its efficiency and effectiveness at the same time. There are numerous ways for organization of the companies worldwide, however the organization of distribution, storage and stocks sometimes does not only depend on the retailer, but also on the product.

The main aim of the paper and research it is based on w be to observe stock level of the tobacco product brand, data is collected from one retail chain in Serbia, in the paper the tobacco brand will be called brand A. Analysis of the brand A stock level trend, discovering the correlation of the observed variables and other impacting factors, all in order to set up an adequate model which can be used by the retailer in the future for everyday work with tobacco products stocks and its costs calculation.

1. ORGANIZATION AND EFFICIENCY OF THE RETAIL DISTRIBUTION

Technological changes, digitalization, globalization and other mentioned trends in modern ways of business led to a trade revolution. Retailer as an end link in the supply chain has connection with consumers, knows them and their needs and because of that become marketing channel leader.

The trade modernization policy in marketing channels leads to integrated and global trade which is the leader in the emergence and development of modern management (Končar & Leković, 2013). Changes in the way of organizing the procurement and distribution process were necessary based on it. The intensity and importance that Internet and technology changes have had on the modern organization of distribution are viewed through a push and pull strategy of production and logistic.

*Scheme 1. Push i pull strategy of the production and logistics*
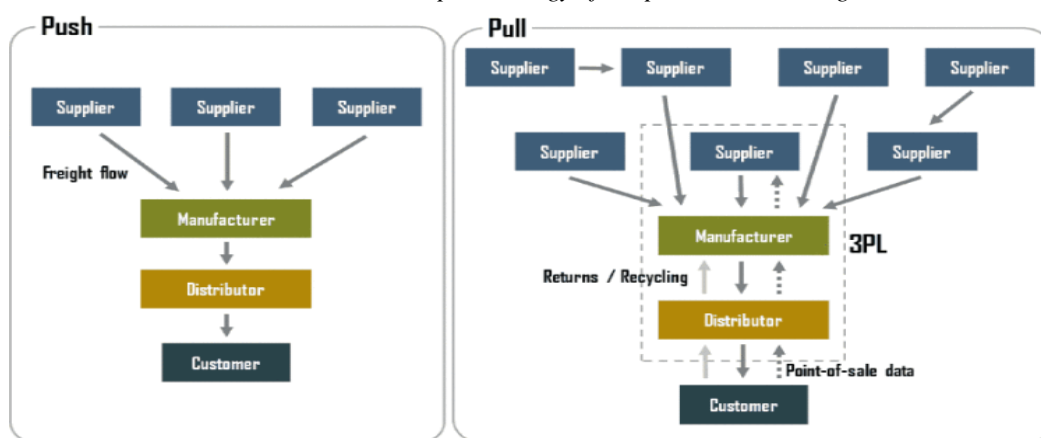
Source: (Rodrigue, Comtois, & Slack, 2009)

A push strategy of commodity flows can be described as a vertical organization within which separate entities supply the next link in a chain and that chain communication flows in one direction. The pull system is based on the two-way communication, the client has the highest point in the chain, and he is the last chain participator, because of data which is obtained from the point of sale (PoS). This way of organizing supply chain implies the interaction between participants in order to achieve as much efficiency as possible within the chain. Information is crucial, as well as data collected and used at the right time by each participant.

Today retailers operate beyond the national borders, big international companies operating all over the world, the result is their horizontal and vertical integration with other participants of the marketing

channel. Retailer as an intermediary in distribution channel has the task to directly distributing goods to end consumers (Koncar, 2015). Large, modern retailers mainly have several different horizontally integrated retail systems, as well as vertically integrated supply systems.

Schema 2. Vertically integrated supply chain - examples
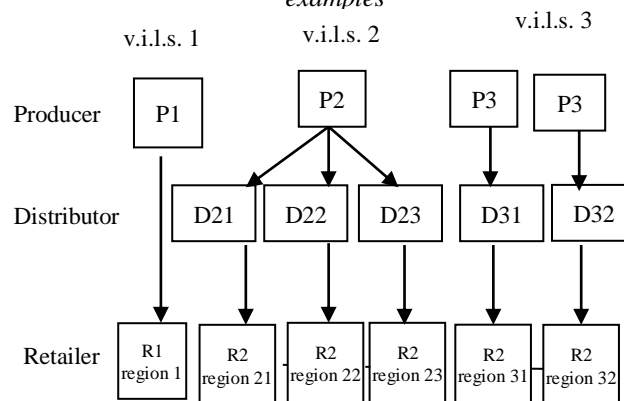
Source: (Stankovic,   2014)

The vertically integrated supply chain 1 is based on the distribution of manufactured goods on the retailer's territory. The whole territory achieves larger control, efficiency of business processes and performance, lower costs due to economies of scale etc. A vertically integrated supply chain 2 is organized with several distributors of one producer are divided into so-called divisions by region of distribution. A long-term relationship is achieved on the distributor-retailer relationship, main characteristics of this system are consumer-oriented orientation, greater flexibility, and however more complex and demanding organization of business, less efficiency of individual business processes, more costs due to reduced economies of scale and orientation to permanently changing requirements of the customers. Finally, the vertically integrated supply chain 3 starts from the division of the producer itself into regions where each producer has a distributor that supplies a retailer in that region. Characteristic of this chain type is the long-term relationships between all participants of the observed chain occur, firstly relationship between the producer and the distributor, and then the distributor and the retailer. Each retail system, depending on its organization, development and needs, has a different way of distribution. The most important factor which determinates the choice of the distribution model are stocks and their management within the system.

2. STOCK MANAGEMENT OF THE MODERN RETAIL CHAINS

The aforementioned technology development and customers' centric approach have added value to the stock management within retail systems. An adequate stock management policy and choosing the right distribution model are the basis for the success. Customers dictate offer, and therefore the dynamics of moving and organizing the stocks of a modern retail system. Stocks represent a puffer between input and outputs streams of material goods, these puffers arise as soon as the difference between the time and the quantitative structure of the input and the outflow stream occurs (Gereke, 1991). Nowadays retailers have large amount of data available which can be used for reading stocks level status of each product in real time and adequate planning of them. Consequently, there are many different systems and ways to organize inventories and access to their planning and identification. In order to determine and adequately set up necessary inventory level for normal operating, decisions about that must be made at the highest level. For normal functioning of a production or retail system both crucial aspects of inventory management must be contained (Božić & Aćimović, 2016):

- **Quantative** – with what is being managed (what makes the assortment), how much goods (all items) should be in stock and how much quantity is needed to renew stocks,
- **Financial** – it is a consequence of the way in which product assortment is structured and a stock management model, and it represents the incorporation of a structural and quantitative inventory into a rational financial inventory management.

The empirical part of this paper will be devoted to quantitative planning and stocks analysis, whereby financial effects will be ignored, assuming that the company has economies of scale, quantity of products sold as a main target. It is necessary to make synergy and optimize the entire procurement process and stocks level regardless on the inventory management approach used in company. When it comes to inventory management itself, the literature has different approaches. Two general approaches used in inventory management are (Božić & Aćimović, 2016):

- **Continuous filling system,** implies that the stocks level are continuously monitored and that their filling is carried out after falling below a certain level, the amount of newly ordered goods is fixed. In this case, the ordering quantities are fixed, and period between the two orders is variable.
- **Periodic system, implies** ordering at fixed intervals, regardless of available stocks level, the size of the order is predefined to provide average stocks level. In this case the interval between the orders is fixed, and ordered quantities are variable. Therefore, this system is also called the fixed interval system. The level of stocks within this system is determined by periodic stocktaking of goods in all facilities in which the stock tracked goods can be present.

In practice, large retail chains are choosing inventory management system according to their distribution and inventory organization. However, retailer must consider product type and its sales before making a decision about used inventory management system, so one retailer can use different systems for different products. The organization of the procurement of each retail system dictates the further flow of inventories and the way they are organized, as well as their costs, planning. There are two ways in which large retailers organize the procurement process (Gruen & Corsten, *A* Comprehensive Guide to Retail Out-of-Stock Reduction in the Fast-Moving Consumer Goods Industry, 2007):

1. Decentralized - each store orders goods for itself, in this case it is necessary at the facility level to consider:
a. Availability and up-to-date information on current stock level and turnover status,
b. Prognosis and ordering process,
c. Replenishment, delivery and speed of filling in shelves.

2. Centralized - there is a function in charge for the procurement process for the entire retail chain. This feature takes care of the following:
a. Ordering goods at certain time intervals, depending on the capacity of the warehouse, distribution centers,
b. Distribution to retail facilities,
c. Refill, the filling speed of the shelves

As well as stock management and organization of procurement depends on the company itself and its targets, and depends on the products that are purchased, i.e. stored. The largest number of modern retailers are supplied capillary; it's a small number of retailers that completely centralized their stocks. However, and these modern retail chains acquire daily consumption products decentralized, in most cases process of distribution is done by the producer or wholesaler itself. Because of the products that are in consumers focus every day and whose turnover is exceptionally high FMCG (Fast-moving consumer goods), companies have to have properly set supply and distribution chains. Marketing orientation for big companies implies targeting of different segments with brands that are specially created to fulfill the needs within (Corstjens & Corstjens, 1995). Various customer groups are targeted with different segments, but each one of them is "empty shelf" sensitive, meaning the inability to buy desired product during the process of purchase. Since the customers opinion and their loyalty are the basis of todays' companies' success, this represent really huge problem. Increased customers intolerance to the fact that product is missing in the object (OOS), with the increase of their importance and technology development lead to the fact that OOS is becoming more and more important topic since 90's (Schneider, 2009).

This is a problem because huge number of customers will seek for some other company product or similar product, and part of them will continue buying that substitute long-term. However, there are customers that in case of lacking the product in the store they will buy the same product in some other store that can become object of their everyday shopping; so, in every retailer interest is not to have OOS. A lack of stocks has negative influence on retailer's business, directly is leading to decrease of sales volume, customers are giving up on purchase, changing retail store or mostly buying cheaper substitute (brand or product) (Grubor, Milićević, & Đokić, 2016). Research about OOS is in the focus especially in the last years; supply chain, logistics, distribution, stocks are gaining bigger importance because of extremely high costs and long-term consequences regarding the relation to end user. This is the reason why is conducted huge number of researches globally. One of those global researches was conducted 15 years ago on developed market with already set retail system, where were tested P&G stocks within largest retail chains. This research showed that usually reasons for OOS occurrence are problems in planning, while in lesser volume those are upstream problems and logistics and CRM disorganization within those retail objects.

Chart 1. Reasons for OOS origination: Global average
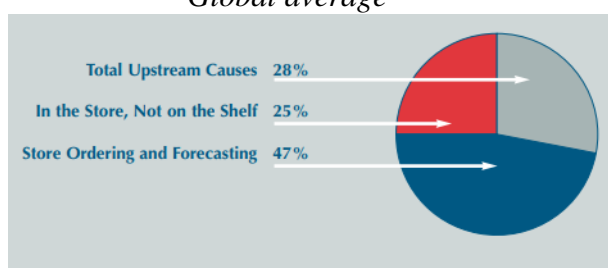
Source: (Gruen, Corsten, & Bharadwaj, 2002)

Mentioned research was conducted in 29 countries and involved over 71.000 customers that were looking for 32 different kinds of FMCG products within modern retail system. On the following chart is shown what customers did in case of OOS in retail object; data that are presented are average on the mentioned sample level so they cannot be applied on one specific country, but they are indicator of customers behavior on developed market.

Chart 2. Consumers respond on OOS, global average

Source: (Gruen, Corsten, & Bharadwaj, 2002)

The largest number of customers in case of OOS was searching for products on the other place, which influenced retailer the most, while lesser percentage of customers bought some others company substitute and even lesser percentage of those who bought the same company product, and more than 20% of them that didn't even make a purchase process. This research confirmed previously stated theoretical facts and as a result it gave mentioned losses for retailer and manufacturer, because both of them lost end user loyalty that dictates market demand.

All mentioned theoretical facts are confirmed on developed world market by global research, however the question is what result will be if the research is conducted in our country? This kind of research would require a huge amount of resources, both financially and human, so in this paper we will focus only on tobacco products and trend of their stocks within one modern retail chain.

3. TOBACCO PRODUCTS STOCK MANAGEMENT ON THE CASE OF RETAIL CHAIN IN REPUBLIC OF SERBIA

Market of tobacco products is still underdeveloped in the Republic of Serbia, but even so, it is one of the most developed market in the region, on which operate big, international companies. With those characteristics, Serbian market has various number of cigarettes and other tobacco products, and even though prices are increasing due to tax, they are way lower than the prices in EU. Tobacco companies alongside with other industries colleagues are segmenting customers groups with certain brands and they are competing each other. Market segmentation can be defined as a process of market dividing to separate consumers' subgroups that have common needs or characteristics and choosing one or more segments to which bidders will target their marketing offer (Schiffman G. & Kanuk, 2004). Sales of tobacco and tobacco products in the Republic of Serbia is strictly regulated with big number of legal and executive acts, therefore tobacco sales and traffic can be done only by certified retailers. Tobacco and tobacco products, unlike other daily products, can be sold only on certified point of sale which is the only place where the communication with customers is possible. That is the reason for investing huge amount of funds in the PoS organization and communication and above all in relationship with retailers and their employees on PoS. As Serbian tobacco market is still underdeveloped, there are various number of different local and international brands with whom customers can be targeted by the companies. When the cigarettes are mentioned we cannot skip the fact those are products that cause smoking addiction, one of the most common addiction, so for the end users is really important to have wanted product in the moment of purchase. The biggest number of retailers in Serbia leaves distribution of cigarettes and other tobacco products to wholesalers, while small number of them are supplied centralized. This way of organizing the distribution gives high importance on the relation between three participants in the channel; between manufacturer, distributor – wholesaler and retailer. With development of technology and techniques each one of the participants can track its sales, stocks, costs and other parameters related to tobacco products in real time. All data are basis for making qualitative sales plans, plans of stocks and organization of distribution. To see success of tobacco stocks planning, we came into possession of sales data and stock data of one of the largest retail chains in Serbia and we made an analysis and forecast of future development trend.

Cigarettes are products with highly expressed seasonality as independent variables that have an impact on stocks, so we observed average monthly temperatures in Serbia and monthly sales of observed cigarettes, brand A.

As we can see in Table 1. the correlation coefficient is 0,7927; interdependence between our observed variables, the value of stocks on one side and temperature and sales on the other side is extremely strong. Determination coefficient is 0,6284 and it shows that this model covered almost 62,84% variations of dependent variables (stocks), while the rest of 27,16% of stock variations are explainable with other factors. Adjusted determination coefficient shows that with model is included 60,52% of stock variations. F-test, i.e. Friedman test has table value of 27,055 while $p = 0,0$ which is less than 0,01 so we can conclude that this model is highly statistically significant. At the end, standard error is a measure that represents accuracy of predictions and in this case it is 2.273 cigarette packs.

Table 1. Basic statistical indicators view and model significance appraisal

	b*	Std.Err. - of b*	B	Std.Err. - of b	t(48)	p-value
Intercept			-9464.53	1952.658	-4.84700	0.000014
Stock A	0.803191	0.090980	15.26	1.728	8.82824	0.000000
Temperature	-0.076344	0.091775	-6.52	7.835	-0.83186	0.409609

Regression Summary for Dependent Variable: Stock A
R= .79270824 R2= .62838635 Adjusted R2= .60516050
F(3,48)=27.055 p<.00000 Std.Error of estimate: 2272.6

Source: Author

First column, parameter b* represents standardized values of this parameter for each and every variable. On the basis of other part of the table, column B, we can create formula of observed model:

$$y = -9.464,53 + 15,26x_1 - 6.52x_2$$

These parameters show stock values if all others independent variables in this model have zero value. Next column is standard error for each independent observed variable of this model. Then we have a column with table values based on t-test. At the end, there is a p value according to rated t-test, on the basis of which we conclude the following:

- Parameter a (it is only theoretical value and has no economic significance) and parameter b_1 are statistically significant, because their value is less than 0,01.
- Parameter b_2 is not statistically significant, i.e. it has no impact on stock trend of observed retailer.

This multiple model will be shown also by chart with square trend, unlike previously presented results of multiple line regression.

Chart 3. Analysis of tobacco product A within the one Serbian retail chain: The correlation between stocks level, sales and average temperatures in the observed time period
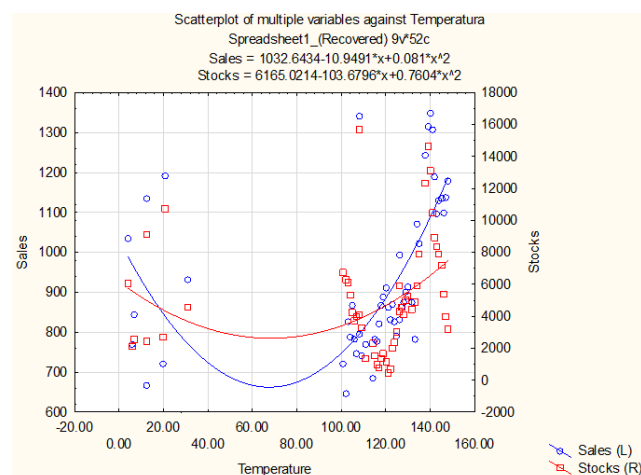
Source: Author

The scatterplot above shows that observed variables (temperature, stocks and sales of product A) have a quadratic U shape (concave up) that fits them and describes the best, the correlation between them is curvilinear. Based on calculated regression equation it can be concluded that observed retailer will have in stock 6.165 packs of cigarettes in case he does not sell product A; sales development trend and stock trend is positive so we can conclude that it is a brand that will have sales increase and stock increase also and that is a brand of cigarettes that is not susceptible to seasonal influences and variations.

Based on calculated regression the retailer could infer that product A stocks will be 6.165 packs of cigarettes in the case there are no sales at POS. The observed product A has positive sales and stock trend, however it is not susceptible to the seasonal variations and influences.

CONCLUSION

In the past period market has been changed, it has been turned to the consumer and its requests. Logistics has been given much more important role and all large companies have in their focus to observe the organization of its chain value not only from the aspect of funds, but also from the aspect of the quantitative flows. With the new way of distribution retailers became leaders of marketing channel and now they dictate its dynamics; organization of distribution and supplies dynamics are now starting from the retailers and their requests.

Republic of Serbia is still undeveloped market looking from the aspect of how retail network is composed and from the aspect of development of tobacco market that was studied. Cigarettes and other tobacco products retailers are getting from the wholesalers, in the exact agreed time and in line with dynamics of consuming. Consumption dynamics and inventory management dynamics of one brand in one of the biggest retailers in Serbia is shown here.

Observed brand A has exceptionally large initially stocks, trend of sales growth, trend of stocks growth in the future was not susceptible to seasonal influences, i.e. average temperature was not statistically significant. Based on everything stated, as a logical conclusion we can say this is a brand that is present on the market for years and it has loyal customers which number is still increasing. In case of OOS, this brand consumers will probably decide to go to other retail object to buy it; considering the fact this is a tobacco product, not some other daily consumption product, there is small number of consumers that will buy a substitute. Brand would face a real problem if a consumer wouldn't find brand A and in next retail object; in that case consumer will switch to some other substitute. OOS of tobacco products is highly specific and today is almost inadmissible due to characteristics and habits that these products are causing, because sales is moving almost perfect in accordance with stocks, which can be seen on this example. In the future growth and advancement of PoS from the aspect of tobacco product storage, and also from the aspect of stocks planning and stocks management in modern system is expected.

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