ANALYSIS OF INVENTORY MANAGEMENT IN COMPANIES FORMING BRANCH PURCHASING GROUPS

ZIMON Grzegorz

Rzeszow University of Technology, Department of Finance, Banking and Accountancy, Rzeszow, Poland, gzimon@prz.edu.pl

Abstract

The aim of this article is to assess and analyze inventory management in commercial companies forming branch purchasing groups. In the article the functioning principles of the purchasing groups and organizations of logistics in this type of groups were discussed. The strengths of the purchasing groups as well as the disadvantages of this type of organizations were shown. The role of the central unit in the organization of supply was discussed. The strategies and methods of inventory management in companies operating within the studied purchasing group were featured. In the article one assessed the impact of each strategy on the financial situation of companies. For the research there were used selected financial ratios and a preliminary financial analysis. The companies analyzed are Polish business units operating in the construction industry. The analysis was made on the basis of the financial statements for the years 2011-2015.

Keywords: Logistics, inventory, purchasing group

1. INTRODUCTION

Commercial companies deal with the purchase and sales of goods. The main objective of the company managers is to buy goods as cheaply as possible and then sell it with the highest possible margin. The organization of work is very important in this type of companies so that the goods do not stack up in the warehouse. Goods should not wait long for a purchaser and it should always be available when the contractor arrives. Too much time deviation in the purchase of goods, warehousing and sales may lead to unjustified costs, which negatively affects the financial results of the company and its safety. Therefore, warehousing and inventory management have a significant impact on the functioning of the company. Inventory optimization directly affects the liquidity and profitability. Errors made in the area of inventory management may lead to lower profitability and may reduce liquidity. The functioning of companies within the purchasing groups is an opportunity for companies to optimize inventory levels, which positively affects the finances of companies.

2. PURCHASING GROUPS

The first Group Purchasing Organizations - GPOs appeared in the US in 1950. Their maximum development was in the 80s and 90s [1]. In Poland, the strong growth of purchasing groups in the retail sector can be observed in the 90s.There are many definitions of purchasing groups. But, to define them properly one should distinguish two concepts of group purchasing and a purchasing group. Very often we can encounter a situation when several companies work together and make a one-time or a several-time common purchase. This type of action should be defined as group purchasing, i.e. a common action in order to purchase merchandise, products, materials or services without creating a special supervising body and without additional restrictions imposed on individual participants of the transaction. It is very popular now to get lower prices. However, a purchasing group should be understood in a different way. It can be described as a group of companies from the same or another industry which combine to make joint purchases [2]. This is a very simplified definition of this type of organization. Another definition defines the purchasing group as a group of cooperating companies. They are managed by a specially created central unit (this is a company which is often referred to as the purchasing group). One can see the similarity to the organization network by which is meant the economic entity formed by or composed of a group strongly linked units, highlighting the strategic which controls unit all the activities of the organization [3]. The central unit is to execute the tasks commissioned by the companies making up the purchasing group. Performing these tasks is to ensure better financial performance and safety for the companies creating the purchasing group [4]. Another more extended definition of the purchasing group is based upon the definitions of logistics and supply chain by Martin Christopher and it is as follows - a purchasing group is a group of cooperating companies which jointly control and improve the flow property, information and cash from suppliers to end customers. The participants of this system create a separate central unit whose main task is to achieve the objectives set out by the companies in the system. It will take definite attitude towards suppliers in order to force them to meet the necessary requirements [5].The most important task of the central unit is the realization of the objectives set by the companies in the system.

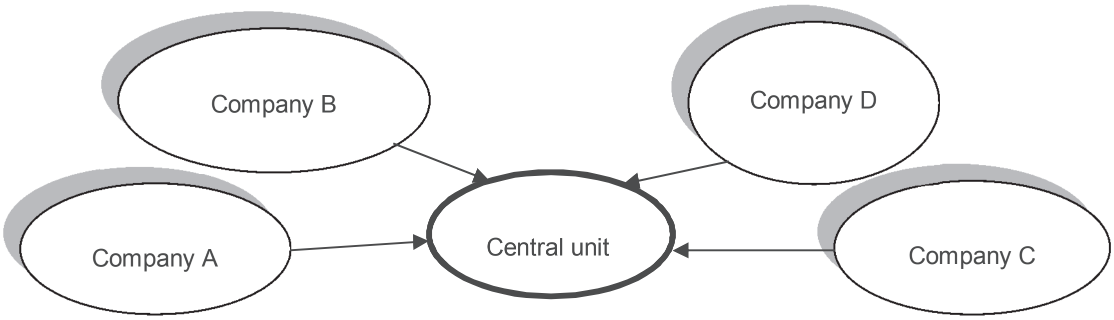

Figure 1 An organization chart of a purchasing group
Source: own study

The purpose of purchasing groups is to protect the individual companies against strong competition and to increase bargaining power [6]. The purchasing group can be described as powerful purchasers. They meet important criteria characteristic for powerful purchasers [7]: they buy large quantities of products, the goods purchased in the sector are standardized, the products purchased in a given sector by a group of purchasers are an important part of its costs. It is the integration of the companies within the supply chain. It is essential to fight the competition, to take joint actions and not continuous rivalry to avoid self-destruction [8].The partnership is the basic condition of the supply chain development [9].

Another important division in terms of efficiency analysis of purchasing groups is the division due to the selection of participants into the branch and multi-branch groups. This division is important because of the intensity of the most important features for the assumed purchase groups, i.e. the economies of scale.

In the branch purchasing groups there are companies operating within only a single branch. This is very significant to increase the "power buy" economies of scale. Companies operating in this type of group order the same type of goods. This limits the range of suppliers to the minimum number. Limitation of suppliers makes that the scale of the order is large. The central unit negotiating conditions of the purchase for a branch purchasing group has a strong advantage which is an order size. This type of organization the supplier (producer) must reckon with.

In the case of the multi-branch purchasing groups the effect of scale is less visible as the entrepreneurs in this case divided into smaller groups and the purchasing power for individual goods, products is lower.The most important goal the companies operating within the purchasing groups want to achieve is a low purchase price. The effective functioning of companies in purchasing groups should reduce costs, increase revenue, improve the efficiency of working capital management [10]. The biggest flaw of operating within the purchasing groups is a difficulty to make a decision. Representatives of companies have a different vision of t development and a purchasing group needs to performed jointly the determined course of action.

3. ORGANIZTION OF LOGISTICS IN A COMPANY OPERATIG IN THE BRANCH PURCHASING GROUP

In commercial companies logistics can be divided due to the function into the distribution logistics and procurement logistics. Logistics distribution allows enterprises to achieve a better position in the market. It is associated with the client and significant impact on sales by raising the level of customer service [11]. Joint action groups can purchase emergency excursions to take advantage of central storage unit or the help of the purchasing group. This is important because it allows to maintain the client. Distribution is the area that each company separately regulates itself. The commercial enterprise procurement logistics is the process of ordering, delivery of goods, and in certain parts of their storage. Supply consists of all the activities that are necessary for the acquisition of goods and services consistent with the requirements of the user [12]. The most important issues related to the purchase of logistics processes are the completeness, quality, timeliness of delivery, because they condition the efficient service processes [13]. Most of the tasks related to the logistics supply supervises the central unit.

Looking at the distribution level and logistics costs due to the cost centers, a very important role in the case of commercial companies performs a warehouse and the key used for the settlement of its costs. The functioning and organization of procurement and distribution logistics in the commercial company operating in the branch purchasing group are shown in **Figure 2**.

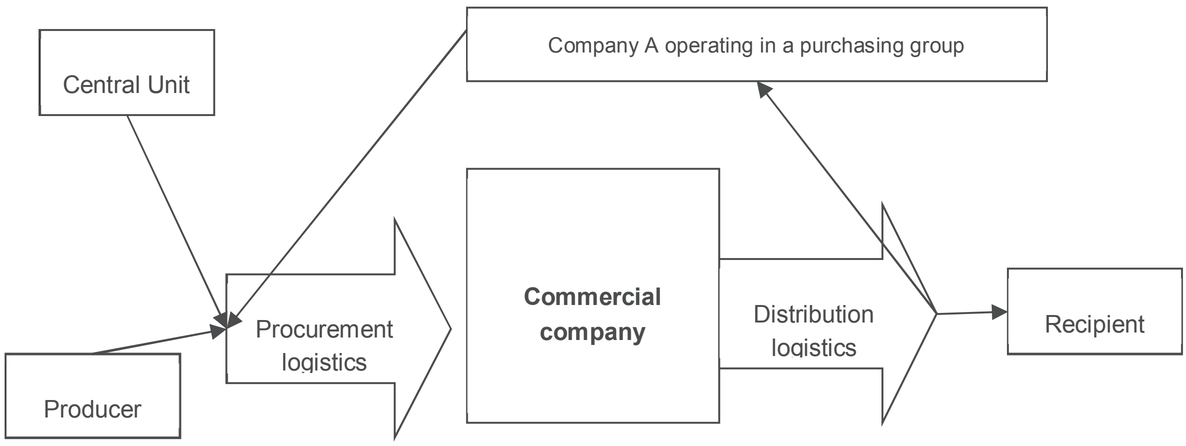

Figure 2 Organization of logistics in a company operating in the branch purchasing group.
Source: own study

In case of the supplies organization the majority of purchases are carried out by the central unit. The company reports the demand and the order process is performed by the central unit. The delivery of goods for the company are directed directly from the manufacturer or are carried from the warehouse of the central unit. The central warehouse serves as the point of separation. It expands the supply chain the companies should pay attention to [14]. Companies operating in marketing and purchasing groups can organize delivery in several ways [15]:

a) direct deliveries from the manufacturer to the company,

This delivery system is possible only if one orders the right size of range set by the central unit. If one orders a small quantity of a given product the companies are forced to use other delivery systems.

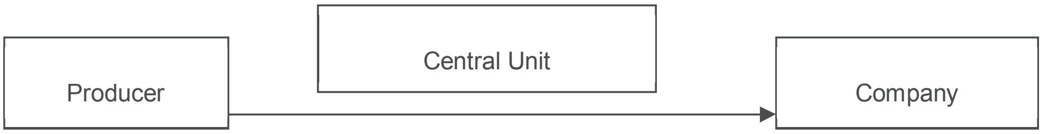

Figure 3 Direct delivery in a purchasing group. Source: own study

The direct delivery system means low costs. Another positive feature is its speed of delivery. The speed and virtually no transport costs are the advantages of this solution. However, this type of supply of goods is possible in case of large supplies. Direct delivery is also maintaining the quality of incoming goods [16].

b) deliveries with the use of the central unit

Supply system with the use of the central unit is a solution for companies that at the time of the offer on the given range did not join the joint purchase, or if they ordered a small quantity of goods which was delivered to the warehouse of the central unit.

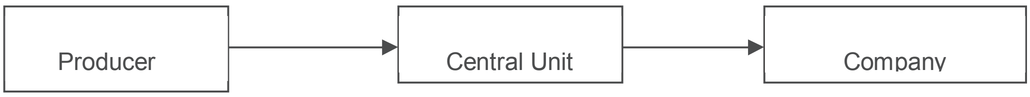

Figure 4 Deliveries with the use of the central unit in a purchasing group. Source: own study

From the warehouse of the central unit different companies take the goods. The major drawback of this system are the costs to be incurred, i.e. the costs of transportation and inventory costs in the warehouse of the central unit.

c) combined deliveries

This model supplies occurs in situations where a batch of goods goes into an area where there are several companies in the purchasing group. Combined deliveries are based on the principles of the concept of Milk-Run and occur when loads are too small to justify the direct deliveries [17].

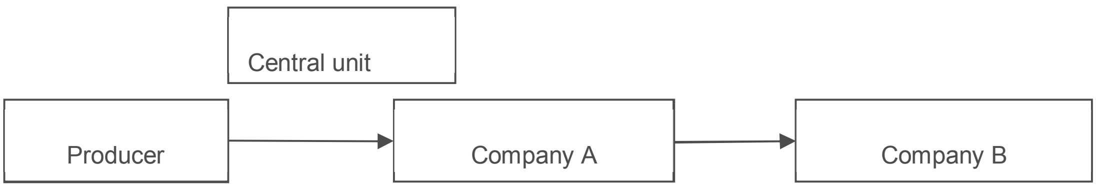

Figure 5 Combined deliveries in a purchasing group. Source: own study

This system is a moderate strategy of supply management. The manufacturer sends the delivery to multiple recipients, which in the following locations (companies) is successively unloaded.

d) deliveries bypassing the producer

The last system is the most expensive one that can be described as an aggressive supply management strategy.

Figure 6 Deliveries bypassing the producer in a purchasing group. Source: own study

These companies use only the warehouse of the central unit. If the goods are in the central unit then the companies may make an order. The cost of goods in this case is high, the central unit adds the costs of storage to the price of goods.

However, orders over the state of safety stock is contrary to the main tasks facing warehouse managers such as reducing inventory levels and cost management [18]. Functioning in the framework of purchasing groups often forces managers to this type of orders, thanks to this they gain a very low price of purchased goods.

4. ANALYSIS OF INVENTORY MANAGEMENT IN THE PURCHASING GROUP

In the surveyed companies about 70% of supplies go to companies directly from the manufacturer. Others are fulfilled from the storage of the central unit, which is related with the higher price of purchased goods. Companies operating in a purchasing group situated e.g. in the same province, or the city can also help one another reselling a missing or superfluous goods. This is an opportunity to supplement emergency-stocks. In this way the individual negotiations with the manufacturer are skipped and one can use previously purchased goods by other entities operating in the purchasing group, and the most importantly, one gains time.

Inventory management in the company consists of three basic strategies:

- defensive or conservative strategy, which is considered safe. Its main aim is to provide safety. Companies that use this type of management have high inventories. This type of management means high liquidity.
- offensive or aggressive strategy which involves minimizing inventory levels. Companies try to optimize inventory levels to that which will not result in downtime in sales. It is a risky model of inventory management.
- moderate strategy is intermediate between aggressive and conservative strategies.

In order to determine the strategies of inventory management an analysis of financial data for the years 2011-2015 of units operating in the branch purchasing groups was done. **Table 1** shows the share of inventories in current assets.

Table 1 Level of inventories in current assets

Company	2015	2014	2013	2012	2011	Average
Company 1	0.55	0.44	0.43	0.44	0.40	0.45
Company 2	0.43	0.42	0.45	0.43	0.41	0.43
Company 3	0.35	0.49	0.51	0.40	0.36	0.42
Company 4	0.25	0.23	0.25	0.27	0.25	0.25
Company 5	0.45	0.39	0.42	0.33	0.36	0.39
Company 6	0.50	0.50	0.47	0.45	0.41	0.47
Company 7	0.54	0.52	0.56	0.54	0.50	0.53
Company 8	0.70	0.61	0.69	0.58	0.53	0.62
Company 9	0.53	0.47	0.48	0.53	0.45	0.49
Company 10	0.45	0.57	0.52	0.47	0.48	0.50
Company 11	0.82	0.85	0.71	0.79	0.59	0.75
Company 12	0.38	0.39	0.49	0.42	0.53	0.44
Company 13	0.42	0.38	0.42	0.42	0.36	0.40
Company 14	0.41	0.35	0.43	0.43	0.46	0.42
Company 15	0.61	0.52	0.59	0.57	0.63	0.58

Company	2015	2014	2013	2012	2011	Average
Company 16	0.40	0.43	0.38	0.41	0.39	0.40
Company 17	0.46	0.41	0.36	0.31	0.33	0.37
Company 18	0.47	0.43	0.49	0.42	0.40	0.44
Company 19	0.36	0.28	0.32	0.35	0.32	0.33
Company 20	0.36	0.33	0.33	0.32	0.34	0.34
Company 21	0.53	0.51	0.59	0.57	0.50	0.54
Company 22	0.50	0.45	0.38	0.34	0.40	0.41

Source: own study

The conducted analysis showed that the average level of inventories in current assets in case of 15 companies did not exceed 50%. It was in the range of 30-45%. This is positive information which indicates that in the studied companies managers try to limit the level of inventories. They do not conduct the defensive. safe inventory management policy. They implement simple methods that facilitate the process of inventory management. e.g. the method of classification ABC. XYZ. However. one should see a gradual increase in the level from year to year.

Table 2 Statistics for the inventory share ratio for 2011-2015.

Year	Share of inventories					
	$\bar{x}$	Me	s	min	max	V
2011	0.43	0.40	0.09	0.25	0.63	21.7%
2012	0.44	0.43	0.12	0.27	0.79	26.4%
2013	0.47	0.46	0.11	0.25	0.71	24.4%
2014	0.45	0.44	0.13	0.23	0.85	28.1%
2015	0.48	0.46	0.12	0.25	0.82	26.1%

Source: own study

Changes between 2011 and 2015 were not accidental - the carried out an analysis of average values for both years and the location of points in a scatterplot allow to conclude that we are dealing with an increase in ratios for most companies. **Table 3** shows the results for the inventory turnover in days.

Table 3 Inventory turnover ratios in days.

Company	2015	2014	2013	2012	2011	Average
Company 1	70.00	70.00	62.00	75.00	52.00	66
Company 2	58.00	60.00	65.00	63.00	69.00	63
Company 3	50.00	64.00	71.00	52.00	46.00	57
Company 4	43.00	38.00	44.00	46.00	41.00	42
Company 5	75.00	68.00	79.00	57.00	64.00	69
Company 6	59.00	55.00	57.00	46.00	47.00	52
Company 7	100.00	92.00	87.00	71.00	53.00	81
Company 8	72.00	61.00	71.00	71.00	66.00	68
Company 9	76.00	63.00	67.00	72.00	72.00	70
Company 10	57.00	64.00	66.00	54.00	66.00	61
Company 11	90.00	82.00	85.00	73.00	70.00	80
Company 12	52.00	49.00	65.00	64.00	82.00	62

Company	2015	2014	2013	2012	2011	Average
Company 13	61.00	58.00	77.00	76.00	69.00	68
Company 14	42.00	36.00	44.00	42.00	50.00	42
Company 15	89.00	81.00	82.00	79.00	78.00	81
Company 16	59.00	59.00	58.00	62.00	54.00	58
Company 17	81.00	69.00	62.00	63.00	71.00	69
Company 18	48.00	47.00	58.00	56.00	46.00	51
Company 19	61.00	45.00	50.00	66.00	52.00	55
Company 20	49.62	46.33	48.94	46.08	46.20	47
Company 21	76.00	67.00	61.00	63.00	67.00	67
Company 22	78	71	65	65	55	67

Source: own study

An analysis showed that in most companies this ratio increases and goods hang in warehouses. This is an unfavorable phenomenon. The positive information is that only two companies have an average inventories at the level of over 80 days. These companies are the entities that in the last three years joined the purchasing group. and yet do not use the mechanisms and benefits of the operation together. The last table shows the liquidity ratios.

Table 4 Financial liquidity ratio for the years 2011 to 2015

Company	2015	2014	2013	2012	2011	Average
Company 1	1.95	1.49	1.54	1.82	1.57	1.67
Company 2	1.24	1.19	1.19	1.24	1.22	1.22
Company 3	3.05	2.71	1.93	1.56	2.12	2.28
Company 4	1.48	1.55	1.51	1.52	1.50	1.51
Company 5	6.10	1.00	6.77	5.04	3.85	4.55
Company 6	2.07	2.01	1.76	1.80	1.64	1.85
Company 7	12.64	8.67	18.44	9.88	8.76	11.68
Company 8	4.64	2.64	2.13	1.63	1.48	2.50
Company 9	7.18	4.79	3.38	2.83	2.00	4.00
Company 10	1.58	1.72	1.60	1.61	1.50	1.60
Company 11	1.40	1.26	1.20	1.41	1.72	1.40
Company 12	1.32	1.15	1.18	1.07	0.98	1.14
Company 13	1.39	1.27	1.33	1.33	1.45	1.35
Company 14	3.57	2.99	2.48	2.23	1.98	2.65
Company 15	9.57	5.33	5.32	3.22	2.64	5.22
Company 16	1.55	1.51	1.45	1.38	1.41	1.46
Company 17	1.47	1.53	1.50	1.38	1.37	1.45
Company 18	1.25	1.29	1.42	1.36	1.40	1.35
Company 19	1.81	1.62	1.44	1.52	1.43	1.57
Company 20	1.29	1.29	1.41	1.38	1.45	1.36
Company 21	2.70	2.40	2.20	2.10	1.80	2.27
Company 22	10.1	8	8.1	4.8	4.9	7.10

Source: own study

Only one of the surveyed companies have the low level of financial liquidity. The rest of the analyzed companies have high liquidity. In the analyzed companies despite the fact that their level of inventories is moderate. it does not inventories disturb them to get high liquidity. It is caused by high levels of debt and low short-term liabilities. which is typical in the branch purchasing groups.

5. CONCLUSION

The studies conducted do not allow uniquely to assign a classic strategy for the surveyed companies. High liquidity. average inventory. a satisfactory level of inventory turnover - all this points to the conservative and moderate strategies. Therefore. for the companies operating in the branch purchasing groups the conservative-moderate strategy should be as an additional strategy to provide inventory management. This strategy in companies operating in branch purchasing groups is based on the guidance information from the central unit. The determination of orders limit. prices. trade credit. discounts and the suppliers is already a central role of the central unit (a specially created company. which can be determined as a purchasing group). The companies which realize conservative-moderate strategy to keep inventories at optimum levels ranging from 30-45% of current assets. They often order more than they need. but to the extent that guarantees them to obtain a high discount. This is how the optimization works. Minimum limits which guarantee attractive prices are determined by the central unit. In this type of organization the methods based on the Just in Time principles cannot be used effectively. The companies which use this method often apply the one which is based on the principles of economic size - EOQ (Economic Order Quantity) and make the inventories classification based upon ABC or XYZ methods. This model of functioning. supported by mutual cooperation of the companies allows to maintain optimal inventory levels and significantly reduce unnecessary costs

REFERENCES

[1] WEINSTEIN B.L. “The Role of Group Purchasing Organizations (GPO) in the U.S.Medical Industry Supplay Chain. “Estudios De Economia Aplicada”. Vol. 24-3. 2006. pp.790

[2] ZIMON G. Wpływ grupy marketingowo-zakupowej na sytuacje i wyniki finansowe przedsiębiorstw. W: Z. Luty. M. Chmielowiec-Lewczuk. (red.). Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu nr 390. Rachunkowość. polityka makroekonomiczna. globalizacja. Wydawnictwo UE we Wrocławiu. Wrocław. 2015. pp.284-290.

[3] SNOW C.C. MILES R.E. COLEMAN H.J. Managing 21st Century. Network Organizations. Organizational Dynamics. Vol 20. No. 3. Winter 1992. pp 5-20

[4] ZIMON G. Kapitał obrotowy brutto w przedsiębiorstwach handlowych tworzących grupy zakupowe. W: I.D. Czechowskiej. R.Pastusiaka (red.). Acta Universitatis Lodziensis. Folia Oconomica 2(300). Łódź: Wydawnictwo Uniwersytetu Łódzkiego. Łódź. 2014. pp. 319-327.

[5] LEENDERS M. JOHNSON P.F. FLYNN A.. FEARON H.E. *Purchasing and Supply Managament. MacGrow-Hill/Irwin.* New York 2006

[6] PRAKASHT S. Group purchasing organization - Undisclosed scandal in the U.S healthcare industry . Palgrave Macmillian. New York. 2009.

[7] PORTER M.. Porter o konkurencji. PWE. Warszawa. 2001.

[8] CHRISTOPHER M.. *Logistics & supply chain management.* Prentice Hall. 2011.

[9] WITKOWSKI J.. Zarządzanie łańcuchem dostaw. Koncepcje. procedury. doświadczenia. PWE. Warszawa 2010

[10] ZIMON G. Płynność finansowa w przedsiębiorstwach tworzących grupy zakupowe. W: Kopiński A.. Kowalik P.. (red.). Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu 321 Zarządzanie finansami firm-teoria i praktyka. Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu. Wrocław. 2013. pp.68-81.

[11] MURPHY jr. P.R. WOOD D.F.Nowoczesna logistyka. Wydawnictwo Helion. Gliwice. 2011.

[12] COYLE J.. BRANDI E.J . LANGLEY jr C.J. Zarządzanie logistyczne. Wydawnictwo PWE. Warszawa. 2010.

[13] SKOWRONEK C. SARJUSZ-WOLSKI Z. Logistyka w przedsiębiorstwie. PWE. Warszawa. 2012.

[14] NOLLETT J.. BEAULIEU M. .*Should an organization join a purchasing group?* Supply Chain Managament. Volume 10. Issue 1. 2005. pp 74-84

[15] ZIMON G. Wpływ grupy marketingowo-zakupowej na sytuacje i wyniki finansowe przedsiębiorstw. W: Z. Luty. M. Chmielowiec-Lewczuk. (red.). Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu nr 390. Rachunkowość. polityka makroekonomiczna. globalizacja. Wydawnictwo UE we Wrocławiu. Wrocław. 2015. pp 284-290.

[16] ZIMON D.. GAJEWSKA T.. BEDNAROVA L.. An Influence of Quality Management System for Improvement of Logistics Distribution. QUALITY ACCESS TO SUCCESS. vol 17. no 155. s. 68-70. 2016

[17] KRAWCZYK S. (red.). *Logistyka. Teoria i praktyka 1*. Difin. Warszawa. 2011

[18] RICHARDS G.. *Warehouse management*. Kogan Paged Limited. London. 2010