Warehousing conditions for holding inventory in Polish supply chains

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Abstract

Warehouses serve as very important links in supply chains. In Poland, with new emerging logistics channels and new supply and distribution networks building up, much more attention should be directed towards warehousing conditions. This paper presents a general analysis of warehouses in the public and private sectors in Poland. It concentrates on types and sizes of warehouses in Polish supply chains. The paper also includes an attempt to evaluate the technical level of warehousing processes in the Polish economy. As a result of that analysis the paper indicates that the efficiency of Polish supply chains and logistics channels could be significantly increased through re-engineered warehousing practices. © 1999 Elsevier Science B.V. All rights reserved.

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1. The role of warehouses for logistics processes

The art of inventory management traditionally separates problems of inventories and warehousing [1]. In fact, these areas are tightly connected. Inventory management determines the requirements for warehousing, e.g. size, location and type of a warehouse. It is easier to adjust a network of warehouses to the needs of held inventory in the long run, since sometimes new investment or restructuring are required. In the short run, the size and type of a warehouse available, sets certain constraints on inventory holding [2].

Warehousing processes are very important since they contribute to the increased speed of material flows in the modern concept of logistics management. Warehousing plays a very important role in all transfers of products from the place of origin to ultimate users [3].

Companies usually organize two types of warehouses: for finished goods and for purchased materials and products. Manufacturing companies run sometimes work-in-process warehouses. Using any warehouse, like owning inventories, increases logistics costs, hence companies often try to reduce number and space of their warehouses to the minimum. However, many distributors or wholesalers aim at maximum increase of the number of offered assortments in order to prevent themselves from loss of sales. Increased range of offered products as...
a rule leads towards higher numbers of SKUs held in stock.

To compromise these two approaches there must be some trade-off. The rules of logistics management suggest that companies should choose warehousing only when holding inventories positively influences other processes in the logistics chain. In other words, warehousing must contribute to the growth of a company’s profits in a greater degree than to the rise of costs.

Warehousing increases the product value in the logistics process since it performs the following functions:

- levelling the intensity of the flow of the goods through subsequent parts of the logistics chain: it may even lead to a total separation of successive stages of the flow;
- increasing the level of customer service through a wider range of offered products;
- securing materials and components for manufacturing processes in order to avoid high costs of production standstill due to material shortages caused by procurement;
- securing proper structure of assortment for distribution and/or procurement when sources of deliveries or customers are dispersed and separate deliveries of single assortments would not be efficient;
- consolidating transported loads for LTL deliveries; benefiting from the economies of scale is based on the reduced costs of transportation [4].

2. Structure of warehouses in Poland

Any attempt to describe warehousing processes in Polish economy is extremely difficult since there is only limited statistical data and little other information in the field. This is particularly true in the manufacturing sector where no reliable data exists on numbers and quality of warehouses and their operating costs.

However, based on the existing limited information, this paper examines the general situation in warehousing in Poland. The majority of information has been collected for the sector of trade.

In many developed countries alternative warehouse strategies are identified and compared. These include private, public and contract warehouses. These three options are not available in Poland in the same pattern. Public warehouses, operated as an independent business offering a range of services, such as storage, handling and transportation, basically just started to emerge. Also contract warehousing does not exist on a wide scale. Most warehouses operating in Poland could be labeled as “private warehouses” owned (or leased) by the same company (private or state-owned) that owns the merchandise stored. Hence we can differentiate between privately owned and publicly owned (i.e. state-owned) warehouses.

The structure of warehouses originating from the previous central planning system greatly determines the efficiency and speed of existing supply chains. In future new warehousing sites located strategically from the point of view of efficiency of logistic chains probably will change the general pattern of warehousing conditions.

The general situation of warehousing of trade companies has been presented in Fig. 1. This figure indicates that warehousing processes in trade companies concentrate in privately owned companies as the private sector is constantly growing in Poland.

During recent years the number of warehouses of trade companies slightly increased, and this growth was somewhat quicker in the private sector. However, the area of warehouses has been reduced and this reduction was largest in the private sector. These tendencies indicate that the average area of a single warehouse was getting little smaller in the public sector and significantly smaller in the private sector.

These tendencies have been presented in more detail in Fig. 2, which shows that the average area of each type of warehouse is smaller in private trade companies. However, the changes of the storing area were varied in different types of warehouses.

The average area of a single open air warehouse in the public sector dropped by about 900 m² but in the private sector the average area of the same type of warehouse increased by around 250 m². In the same period 1991–1995 the average area of a warehouse building dropped by more than half in the
private sector, and only by one third in the public sector.

These data indicate that the private sector seeks the least expensive ways of storing goods through the following measures:

- significant reduction of warehouse area;
- increased area of open air warehouses with the lowest storage costs;
- reduction of the average warehouse building.

Public sector also implements some saving measures in the field of warehousing but they are different from the trends in the private sector.

The described above trends shaped a specific structure of warehouses in Polish trade companies:

- growing number of constantly smaller warehouse buildings; as a result the share of this type...
of warehouses according to their area dropped in 1995 by 10% from 1991;
- reduced number of open air warehouses with constantly larger area; hence their share in the general warehousing area rose by 9% in 1995;
- diminishing number of silos and tanks.

Additionally, the differences between the structure of different types of warehouses in the private and public sectors start disappearing. While in 1991 buildings dominated the structure of warehouses in the private sector, in 1995, the structures of both sectors: private and public became similar as a result of described earlier tendencies (see Fig. 3).

Available statistic data describes also the types of products stored mostly in the warehouses of trade companies. Generally the largest warehouse networks store the following assortments:

- foodstuffs, where the share of private sectors absolutely dominates;
- timber and construction materials, metal products, construction equipment; these products are stored mainly in the private trade sector but public sectors companies have larger warehouses;
- cosmetics, paints, wallpaper, where the private sector owns a greater number of warehouses with relatively smaller area than the public sector.

A special group of warehouses are those storing furniture. The number of these warehouses is really small in the public sector but according to their area this sector certainly dominates.

3. Technical level and utilization of warehouses

The utilization of warehouse area in companies is another important problem of the logistics chain efficiency. Unfortunately, there is virtually no statistic data in this field available in Poland. However, some light on this problem could be thrown by a survey carried out in a number of Polish companies.¹

In the surveyed group the number of warehouses reported by companies was much varied. Most of the different types of warehouses has been declared by manufacturing companies, and particularly steel plants and chemical industry plants. Surveyed

¹This survey was a part of the research project carried out within the framework of the Central European University Grant No. RSS 526/93. The project was titled “Logistics Change During the Period of Transformation in Poland”.
wholesalers own or rent usually one or two warehouses. Large trade companies in the public sector operating in the wholesale and retail markets report having five warehouses on the average. In most cases, these were centralized warehouses, serving the pure purpose of storing products. They were not an instrument of a well defined inventory or distribution policy. Some of these warehouses have a local character.

The level of utilization of warehousing space in surveyed companies has been illustrated in Fig. 4. It shows that this level varies greatly from industry to industry and from sector to sector.

In the group of manufacturing companies the level of warehouse utilization is the lowest for steel plants and the highest for chemical industry companies. Within trade companies almost 100% utilization of warehouses has been reported by private wholesalers but on an average trade companies utilize only one half of the capacity of their warehouses.

Such poor utilization of warehouse capacity may suggest that stocked goods generate additional costs in large companies that for various reasons are not able to use the economies of scale in their warehousing processes. Many of these large warehouses originate from the past “economy of shortages”, when any level of inventory was never sufficient. In the present market situation, inventories are reduced to their lowest possible levels due to hard financial constraints imposed on companies by competitive practices. The remaining non-utilized warehousing capacities are sometimes used for strategic business operations in the form of leasing free space to other firms.

The efficiency of warehouse operations depends to a great extend on the type and technical level of the equipment used in the warehouse. The equipment used for storing and materials handling also contributes to the reduction of storage costs due to the limited demand for e.g. additional labour force, shorter time of materials handling activites performed easier and simpler, etc.

In all the surveyed companies, the level of mechanization and automation of materials handling processes was very low (see Fig. 5).

The average level in the 5-point Lickert scale equals to 3, so only the warehouses of steel plants and companies in chemical industry have level of mechanization higher than the average. The level of automation is generally very low. Somewhat higher level of mechanization declared by wholesale and other trade companies may result from the fact that part of their warehouses consists of foodstuffs storage devices. They use automated systems to secure proper conditions (e.g. temperature, humidity, etc.) for storing particular products.

![Fig. 4. Level of actual utilization of warehouses owned by surveyed companies (Source: On the basis of materials of the Main Statistics Office in Warsaw).](image-url)
4. Conclusions

The above described facts and tendencies suggest a conclusion that there are enormous potential possibilities of improving the efficiency of warehousing processes in the Polish economy.

As a first and most important course of action one has to mention the promotion of business logistics management. The ideas of seeking efficiency and adding value to the product flow process have to be more widely understood and shared. Probably this is the prerequisite for better understanding and appreciation of warehousing problems that eventually would lead to constant improvements in this area.

The traditional approach to warehousing that prevails among Polish companies meant to maintain a supply of goods to protect against uncertainty has to be replaced by contemporary concepts of strategic storage. Warehousing, besides mere goods stocking, should perform many other value-added services thus enhancing the full utilization of their capacities. It has to be accompanied by proper planning, equipping and initiating warehouse operations.

Creation of the conditions suiting the requirements of the modern supply chains could also help to rationalize the levels and structure of stocks so that finally the speed and efficiency of material flows could be at its maximum level.

References