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METHODS OF CLASSIFYING THE CONSUMER GOODS

In a trade company the position of the warehouse is a very important factor for its management. It is the stock on hand that decides about the security of current sales. From the current activity point of view, the present level of stock of goods is essential. However, from the management point of view very important is the knowledge of the current stock in order to analyze it with popular quantity methods. There can be a lot of criteria of analysis, but one of the goals of management is the budget control. A vital part of it is an investment in stock. The aim of this article is to check, what kind of results we can get by taking the ABC and XYZ classification. We analyze stock data as a purchase cost.

We concentrate on the stock of a company operating on the Polish market and dealing in interior equipment. The main line of products include: bookshelves, display stands with accessories, cornices, cornices accessories, fabrics, roller blinds, awnings.

The analysis involved 7379 index positions. One year, divided into 52 weeks, was a period of the analysis (historical data of stock-in-trade from the year 2003). The number of no score items amounted to 4173, what makes 56,5% of all items. There can be a difference between following years, what results from the product life cycle, as well as from introducing new or substitute products in the place of the existing ones. The aim of ABC classification was to distinguish the most expensive goods [2]. That is why the period of analysis was the whole year. Coefficients: α (between A and B class) and β (between B and C class) were fixed on a level adequately 0,75 and 0,95.

Table 1 shows the results.

As we can see, about 74% of the sale value comes from only 8 items from the list. It means that the analyzed company has a small, but very strong group of goods with an essential influence on the stock management. Most items fell into the group C – about 97%. It is the reason to assume, the list of goods is very crumbled. They can be sold in sets (cornice with accessories) but not necessarily.

Table 1. ABC classification results

Class	Number	% share	Value	Value share
A	8	0,25%	16 351 226 500,81	74,19%
B	95	2,96%	4 578 656 367,49	20,77%
C	3103	96,79%	1 111 116 776,41	5,04%
Total	3206	100,00%	22 040 999 644,70	100,00%

Source: own study.

The following was the XYZ classification. It was carried out on the same data as ABC. Coefficients: α and β between X,Y,Z classes were adequately 0,15 and 0,50. Results confirm current observations – irregularity of the analyzed phenomenon in the period of time (original data). The same analysis was carried out on a modified data. This way we can eliminate no-score periods which can result from shortages in stock. In this case two series were analyzed. The first one was smoothed out by moving average from 3 periods of time, the second was smoothed out by five period moving average. There are statistical reasons for those parameters [1].

The results are presented in the Table 2.

Table 2. XYZ classification results

Class	Original	k = 3	k = 5
X	0	0	0
Y	0	119	286
Z	3206	3087	2920

Source: own study.

The summary of both classifications, ABC and XYZ (series smoothed out by five period moving average), makes data identification easier. No-score periods, which are characteristic for this kind of market, can be eliminated by smoothing the series. Table 3 shows the results.

Table 3. ABC classification in modified periods results

Class	X	Y	Z
A	0	5	3
B	0	49	46
C	0	232	2871

Source: own study.

The above results shown visibly, that the three most difficult groups in management: AZ, BZ and CZ compose a larger part of goods than those from the group Y. That is why a much more detailed analysis is needed if want to search for management arguments.

The adequate data preparation, which takes into consideration some events on market like unstable demand, allows more careful observation and analysis of complicated market economy. Results of both classifications are not unambiguous as for data character.

A serious disadvantage of this kind of analysis is that it shows only physical turnover, not real demand. It does not include any information about the lost demand (which can result from stock shortages), complained goods returned by customers, damaged goods or certain principles in contract about the possibility of returning the goods back to the supplier.

Data modeling requires a good identification. It means identifying its main statistical parameters. The example is the analysis of chosen product. We look for parameters like: purchase costs average, standard deviation, variability coefficient, and the group in ABC and XYZ classification.

Table 4. Statistical parameters for chosen product

Average	Standard deviation	Variability coefficient	ABC classification	XYZ classification	k = 3 : XYZ classification	k = 5 : XYZ classification
72694,33	49133,13	0,68	C	Z	Z	Y

Source: own study.

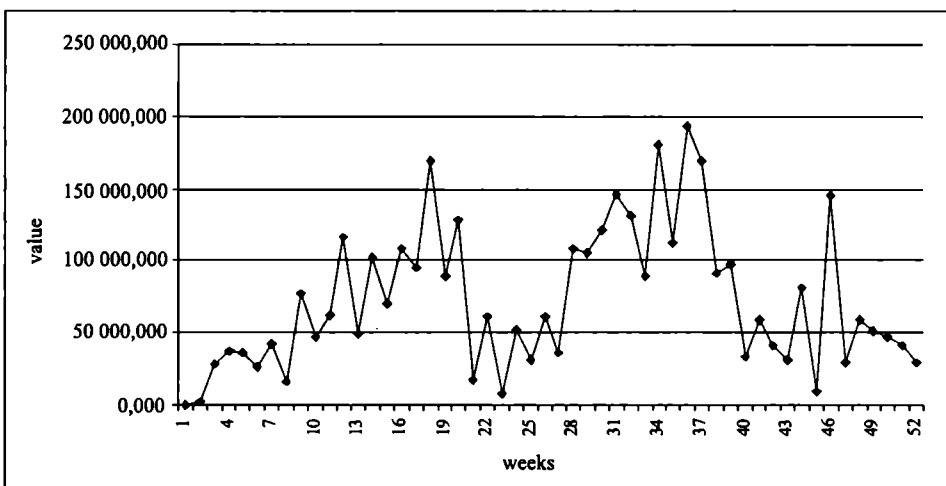


Fig. 1. Purchase costs in 52 weeks

Source: own study.

First, the product was in Z group. Now it is in Y group. It shows the meaning of data smoothing. Graphs show data in three combination: original, smoothed out by three periods moving average, smoothed out by five periods moving average.

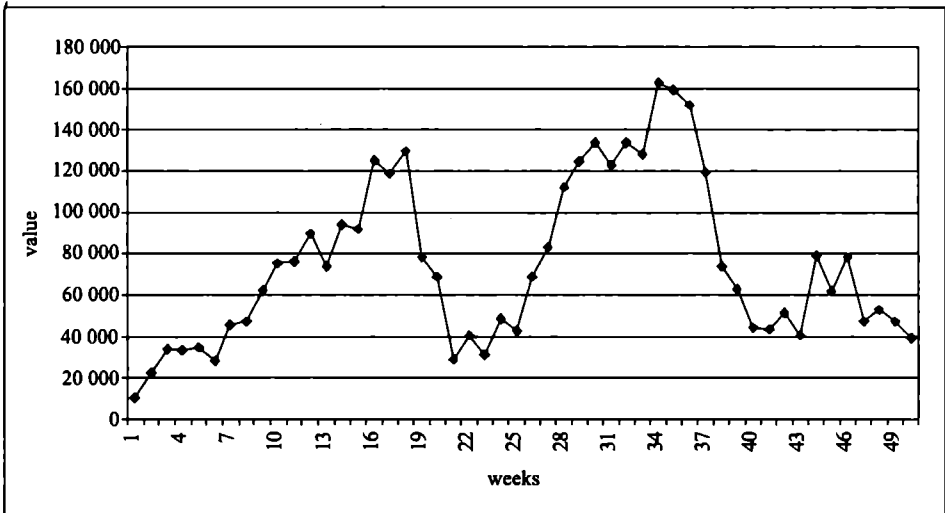


Fig. 2. Purchase costs smoothed by three periods moving average

Source: own study.

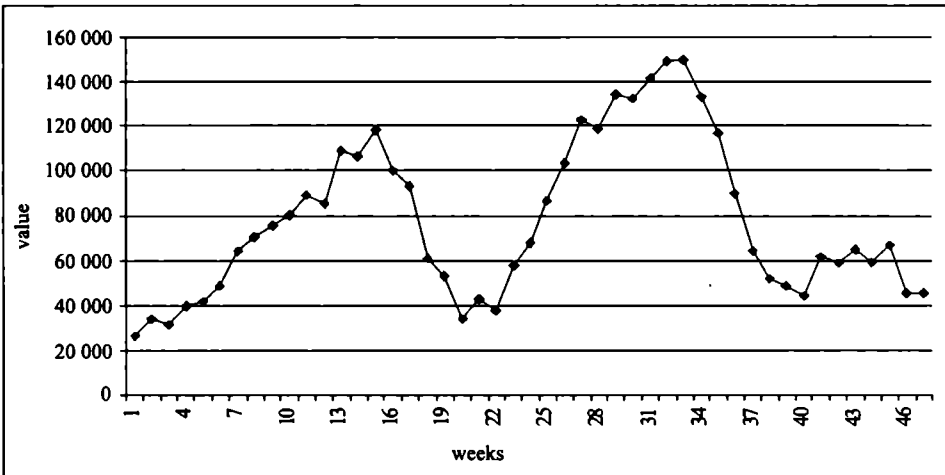


Fig. 3. Purchase costs smoothed by five periods moving average

Source: own study.

Smoothed data shows clearly some cycles in time, but we can not talk about the seasonal character of this data. The analysis has to be carried for some other time periods like a month or even a day (if possible) and has to be then compared.

The analysis using ABC and XYZ classifications is a very important stage when identifying the demand, but not homogenous as for results. In order to identify the real data character it is advisable to carry out different tests, too. Fundamental here is data preparation and the period chosen.

References

- [1] Józwiak J., Podgórski J., *Statystyka od podstaw*, PWE, Warszawa 1992.
- [2] Krawczyk S., *Metody ilościowe w planowaniu (działalności przedsiębiorstwa)*, C.H. Beck, Warszawa 2001.

METODY KLASYFIKACJI TOWARÓW W MAGAZYNIE

Streszczenie

Artykuł oparty jest na analizie zbioru danych o obrocie towarowym w przedsiębiorstwie handlowym. Klasyfikacje ABC i XYZ zostały przeprowadzone na całym asortymencie znajdującym się w ofercie firmy. Do klasyfikacji ABC przygotowane zostały dane o kosztach zakupu towarów z okresu całego roku. Klasyfikacja XYZ przeprowadzona została na tych samych danych w układzie tygodniowym. Dodatkowo, w celach poznawczych dane zostały zmodyfikowane poprzez wygładzanie metodą średnich ruchomych z trzech i pięciu okresów. Wyniki wskazują na konieczność przeprowadzenia analiz w innych jednostkach czasu.