

The verification method of the production assortment structure in the furniture factory

MIECZYŚLAW SZCZAWIŃSKI; MAGDALENA OLKOWICZ

Department of Technology, Organisation and Management in Wood Industry; Warsaw University of Life Sciences;

Abstract: *The verification method of the production assortment structure in the furniture factory* The proposed model can facilitate the verification of the production assortment structure by taking account of changes in a cost per unit of given product, its sales volume and selling prices in the test measurement periods: the shaping a more profitable market offer takes account of the main restrictions of the function growth by criterion (ΔZ_n), that is absorbency and production capacity.

Keywords: verification method, assortment structure, furniture, product,

INTRODUCTION

In business activity of industrial plants, including furniture factories, we can meet with the problems of forming a rational production assortment structure in a given stage of the cycle of economic situation. The offer of products should be conducive to maximize the operational profitability of manufacture and sale. This depends mainly on the products attractiveness in relation with proposed prices in the circumstances of increasing competition, such as manufacturers in Asia. In the furniture industry, the main factor, which determinants buyers' interest in given type of furniture, is the exterior appearance corresponding with current fashion trends. Therefore, we can have to do with various moments of coursing of the life cycle each furniture group in the factory offer. Thus, the question of relatively close verification of the production structure, is open. It is also heads for disclosure of products, which profitability can decrease in the background of total production.

The verification can incline to take action in the direction of replacement the products, that at that time of measurement period are in the decadent phase of their life cycle, with new type of products.

MODEL OF ANALYSIS THE PRODUCTION ASSORTMENT STRUCTURE

Considering changes in net operating profit of the whole plant and its production range of products, we analyze the impact of three major factors, i.e. changes:

- unit costs of production,
- volume of sold production,
- unit prices.

The fundamental instrument, which decides about economic prosperity of the plant, is a level a net profit from business activities and its changes. There are especially changes in the net operating profit from the basic activity i.e. the furniture production. Thus, the increase in net operating profit for the adopted measurement period, i.e. month or quarter, will be:

$$\Delta Z_n = f \Delta Z_b$$

where:

- ΔZ_n — increase in net operating profit during the considered period,
- ΔZ_b — increase in gross profit (before taxation during the considered period),
- f — share ratio of factory in gross profit,

The increase in gross profit (ΔZ_b) will consist of:

$$\Delta Z_b = \Delta K + \Delta P + \Delta C$$

where:

ΔK — value of economic effect, i.e. profit or loss as a result of changes the unit costs of production,

ΔP — value of economic effect as a result of changes the volume of sold production,

ΔC — value of economic effect as a result of changes the unit costs,

where:

$$\Delta K = \sum_{i=1}^n (k_{i1} - k_{i2}) P_{i2}$$

$$\Delta P = \sum_{i=1}^n (c_{i1} - k_{i1})(P_{i2} \pm \Delta Z_{pi2} - P_{i1} \pm \Delta Z_{pi1})$$

$$\Delta C = \sum_{i=1}^n (C_{i2} - C_{i1}) P_{i2}$$

where:

k_{i1}, k_{i2} — unit cost of production i product, after start and after finish the measurement period,

c_{i1}, c_{i2} — unit price of i product, after start and after finish the measurement period,

P_{i1}, P_{i2} — total revenues from sales of i product, after start and after finish the measurement period,

$\Delta Z_{pi1}, \Delta Z_{pi2}$ — supplies inventory result of i product, after start and after finish the measurement period,

$i \in \langle 1, n \rangle$ — reference number of product in the factory's offer.

As result from the above reasoning, the basic criterion for verifying the structure of commodity production is maximize total operating profit of the plant and its dynamics in the analyzed periods of measurement, i.e.:

$$\Delta Z_n \geq 0$$

If it is turn out, that permanently (by measuring a significant number of periods: months, quarters or perhaps years) $\Delta Z_n < 0$, the commodities affecting negatively the operating result should be revealed. We ought to aim at eliminating them, because is possible that the cycle of their life came to an end, if only other important factors do not have an influence on leaving they in the bid of plant. They may indeed represent such a cost-effective component in the production of a set of furniture.

The operating profit maximization is proceeding under the influence of conditions limiting changes the structure of production.

The most important of them:

1. *Market capacity:*

$$P_{i2} \geq P_{i1} \ll Q_i$$

where:

Q_i — maximum number of i type of product, which finds buyers; is to determine through market research.

2. Production capacity of the i product (Z_{di}):

$$P_i \leq Z_{di},$$

and the whole plant:

$$\sum_{i=1}^n P_i \leq \sum_{i=1}^n Z_{di}$$

The fact is, in the event unforeseen circumstances which can cause stoppages in production or sales, it is necessary to take into account reserve of production capacity, which is estimating at 15-20%.

Estimating the production capacity of the plant we are usually dealing with some expensive workplaces which are the proverbial "bottleneck", which they can limit the production capacity with respect to a particular product. Because of production process, the expensive work station has to be used. It usually works on more than one shift and the plant's production capacity can be increased significantly because of that.

SUMMARY

The proposed verification model of the production structure can facilitate the forming of furniture offer aimed to maximize net operating profit by withdrawals of products, which the life cycle enters into the decadent phase and as with lapse of time, it will draw to a close.

The detection of this phase may facilitate: the examination of the sales volume of the given product, lack of price growth below the inflation rate even in a successful phase of the business cycle, and what is very important, the increase of supplies inventory that product in the warehouse.

REFERENCES

1. RATAJCZAK E., 2001: Rynek drzewny. Analiza struktur przedmiotowych; Rozprawa hab. ITD. Poznań, 2001
2. SZCZAWIŃSKI M., 2004: Efektywność postępu techniczno-ekonomicznego w produkcji przemysłowej; Przemysł drzewny nr 1, s. 23-24;

Streszczenie: *Metoda weryfikacji struktury asortymentowej produkcji w fabryce mebli*

Proponowany model może ułatwić weryfikację struktury asortymentowej produkcji przez uwzględnienie zmian kosztu jednostkowego danego produktu, wolumenu jego sprzedaży oraz cen zbytu w badanych okresach pomiarowych: kształtowanie bardziej opłacalnej oferty rynkowej uwzględnia główne ograniczenia wzrostu funkcji kryterium (ΔZ_n), tj. chłonności rynku oraz zdolności produkcyjnej.

Corresponding authors:

Mieczysław Szczawiński, Magdalena Olkowicz
Warsaw University of Life Sciences;
Department of Technology, Organisation and Management in Wood Industry;
ul. Nowoursynowska 159
02-776 Warszawa, Poland
e-mail: mieczyslaw_szczawinski@sggw.pl
e-mail: magdalena_olkowicz@sggw.pl