ASSESSMENT OF PRODUCT COMPETITIVENESS OF TERRITORIAL DEPARTMENTS OF SOUTHWEST STATE ENTERPRISE

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ABSTRACT

The competitiveness of product being offered is very important for company's competitiveness and successful business development. In Bulgarian forestry the main product is timber. It provides more than 85% from the revenues of state enterprises (DP), which are established with art. 163 from Forest Act (ZG), for management of state forest territories. Because of that the goal of this paper is to offer and verify practically applicable approach for complex quantitative assessment of competitiveness of timber, which is realized from territorial departments (TP) of DP. In current study the assessment of timber competitiveness is done on the basis of quality and price. Criterion for the quality of production is the maximum realized quantity of timber from the respective category and tree species. On the basis of the two sub-indicators, which are transformed from named to unnamed values through the classical standardization formula and linear ordering towards point-pattern in two-dimensional space is done ranking of TP – state forestry ranges (DGS) and state hunting ranges (DLS) of Southwest State Enterprise (UZDP) Blagoevgrad in terms of competitiveness of deciduous firewood sold from temporary storage[1] in 2018.

Key words: product competitiveness, timber market, price, quality, state enterprise

[1] In the Forest Act from 2011, article 112 is pointed out that the use of wood from state and municipal forest territories can be realized in two ways: through sales of standing timber and through harvesting and sales of felled timber. The procedures for sale of standing and felled timber are described in details in The Ordinance on the Terms and Order for Assigning the Implementation of Activities in the Forest Territories – State and Municipal Property, and The Use of Timber and Non-Timber Forest Products [8, 15].

INTRODUCTION

On the basis of questionnaire survey conducted during the first phase of research project NIS-B-1140 funded by the University of Forestry – Sofia it has been established that according to the respondents working in the forestry of Bulgaria the most important indicator for forestry company competitiveness is the competitiveness of product being offered. Because of that the goal of this paper is to offer and verify practically applicable approach for complex quantitative assessment of competitiveness of timber. It is the main product providing more than 85% from the revenues of DP, which are created with art. 163 from ZG, for management of state forest territories in Bulgaria [6].

1. DEFINITION OF THE CATEGORY 'COMPETITIVENESS OF PRODUCT BEING OFFERED'

The substantiation of approach for quantitative assessment of timber competitiveness in Bulgarian forestry requires clarification of the essence of the category 'competitiveness of product being offered'. In this relation in lines below is done literature survey.

The importance of competitiveness of product being offered for business success of company is indisputable. Furthermore some authors identify it with enterprise competitiveness. According to them if certain products are demanded in the market then the company that has produced them is competitive [cit. in 13]. This point of view is shared by many authors. For example A. Ambastha and K. Momaya determine company competitiveness as the company's ability to design, manufacture and sell better products than its competitors, taking into account price and some non-price quality criteria [1]. These authors do not consider the fact that product competitiveness is not equivalent to company's competitiveness as the first one can be achieved with lower price, larger costs aiming higher quality of products and poor financial results [cit. in 13]. In order to make distinction from such understandings it is emphasized that in present paper the competitiveness of product being offered is perceived as indicator that characterizes one of the aspects of the complex multifaceted category enterprise competitiveness. Due to this the attention is focused on defining sub-indicators on the grounds of which a quantitative assessment of the level of competitiveness of product being offered can be done.

In specialized literature are noticed four main approaches for product competitiveness definition: commodity, selling, pricing and marketing. According to **the commodity approach** the product quality is most important for product competitiveness. **The selling approach** emphasizes on the dependence of sales revenue from product competitiveness. **The pricing approach** perceives product price as universal characteristic of all consumer and exchange features as the high price product is considered highly competitive. **The marketing approach** considers product competitiveness as its complex feature, which points out its attractiveness to the consumers [4]. In fact the level of attractiveness depends on the value that customers acquire. At the same time companies can offer higher consumer value through offering different combinations of increased total value and reduced total costs for the customer [4]. In the notions of different authors working out in the field of competitiveness are met some of the main characteristics of the four approaches for product competitiveness

definition presented above. For example according to research of N. Ćurčić and V. Miletić main factors determining competitiveness of Serbian industrial and agro-industrial products on international markets are competitive price, good design, high functionality, fast service, quality marketing and so on. [3]. This point of view is shared by D. Yue and A. Brychko. They think that with the development of new technologies the product competitiveness is determined not only by costs of production and its volume but also by price, quality and adaptability towards needs of clients [14]. The idea of customer's preferences is supported by A. Yudanov who points out that they are paramount for product competitiveness [cit. in 12]. In connection with product attractiveness for clients E. Tyunyukova et al. work out groups of indicators which allow assessment of product competitiveness. The groups of indicators are: economic, standardizing, technical, operational, ergonomic and aesthetic [12]. Here should be underlined that in the specialized literature there is not universal system of indicators for assessment of product competitiveness applicable to different types of products. In most of the studies as main components of product competitiveness are considered quality and price, but there are other studies in which the number of groups of indicators is larger. For example for assessment of consumer product competitiveness O. Tziunchik offers five groups of indicators – classification, quality, indicators of production efficiency, economic and marketing [cit. in 4]. At the same time T. Dimitrova proposes four groups of indicators in correspondence with the marketing mix 4P and namely: product, price, promotion, place [4].

On the grounds of the presented above and taking into account the characteristics of forestry, the main product extracted from Bulgarian forest territories and namely timber as well as the possibilities for its use, which are regulated through Forests Act and The Ordinance on the Terms and Order for Assigning the Implementation of Activities in the Forest Territories – State and Municipal Property, and The Use of Timber and Non-Timber Forest Products [10], in this publication for definition of timber competitiveness are used commodity and pricing approaches. Based on this and in conformity with the paper's goal the product competitiveness is estimated by means of two sub-indicators – quality and price of the main product – timber. According to the timber size assortments it is differentiated into the following categories – large, medium, small and firewood, and according to the tree species of deciduous and coniferous. Concerning this the timber market can be divided into eight segments. Relative criterion for product's quality is the maximum volume of realized timber (large, medium, small and firewood) from a given forestry unit. Of course in assumption that on the local/regional market the supplied quantity of timber is sufficient to satisfy the demanded one from the respective tree species and category. Concerning the price of timber in present paper is supported the thesis that the higher price is equivalent to the higher competitiveness of the supplied timber of course in assumption that the prices of the alternative products remain unchanged [2].

2. APPROACH FOR QUANTITATIVE ASSESSMENT OF TIMBER COMPETITIVENESS

The methods for assessing product competitiveness are diverse and can be conditionally systematized in two groups – objective and heuristic [4]. The main disadvantages of most of them are lack of complexity in assessment and inability to obtain

summarization that is normalized within certain limits. In present study these shortcomings are overcome by linear arrangement in two-dimensional space. The essence of the proposed approach is presented in the lines below.

The sub-indicators for quantification of timber competitiveness substantiated above are in different units for measurement (m^3 and BGN/m^3). Their aggregation requires the quantity and the price to be transformed from named to unnamed values. For this purpose the following formula is applied [9]:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{\sigma_j}, \quad (1)$$

where z_{ij} is the standardized value of the j-th sub-indicator at the i-th TP;

x_{ij} is the value of the j-th sub-indicator at the i-th TP;

$\bar{x}_j$ – is the average for the relevant j-th sub-indicator;

σ_j – the standard deviation of the j-th sub-indicator.

The linear ordering of TP in regard to indicator timber competitiveness is done on the basis of point-pattern in two-dimensional space and establishment of location of the respective TP towards this point. On this basis are calculated two-dimensional indicators (quantitative assessment) normalized within boundaries from 0 to 1. For this purpose are used the standardized values of sub-indicators presented above and the coordinates of the pattern point in two-dimensional space are determined. Such are the extreme values of the standardized indicators. In concrete case they are stimulators. This means that the higher value is connected with the increase of the quantitative assessment of the level of timber competitiveness. In formula (2) both sub-indicators are taken with their maximum values [5, 11]:

$$k_{ie} = \sqrt{\sum (z_{ij} - z_{ej})^2} \quad (2)$$

where k_{ie} is the Euclidean distance between the timber competitiveness of the i-th TP and the pattern point;

z_{ij} – the standardized value of the j-th sub-indicator of the timber competitiveness of the i-th TP;

z_{ej} – the standardized value of the j-th sub-indicator at the pattern point.

The quantitative assessment (two-dimensional indicator) of the level of timber competitiveness of the i-th TP is determined through the formula (3) [5, 11]:

$$K_i = 1 - \frac{k_{ie}}{k_e} \quad (3)$$

where K_i is the two-dimensional indicator (quantitative assessment) of the level of timber competitiveness of the i-th TP;

k_e – sum of the mean value of all Euclidean distances determined through formula (2) and their doubled standard deviation.

3. ASSESMENT OF COMPETITIVENESS OF BROADLEAF FIREWOOD REALIZED FROM TEMPORARY STORAGE BY TP OF SOWTHWEST STATE ENTERPRISE (UZDP) IN 2018

In 2018 the sale of broadleaf firewood provides revenues which amount to 13 018 thousands BGN or 18.18% from total revenues of UZDP [7], which determine them as main source of revenues for the enterprise. Due to this the methodology presented in the previous point for product competitiveness assessment is verified through data for broadleaf firewood realized from storage by TP DGS and TP DLS of UZDP Blagoevgrad in 2018.

The data about the realized quantities of broadleaf firewood and prices as well as their standardized values by TP of UZDP Blagoevgrad are presented in table 1.

Table 1. Sub-indicators for assessment of competitiveness of deciduous firewood realized from temporary storage in 2018 by TP of UZDP

TP	Price, BGN/m^3	Realized firewood, m^3	Standardized prices	Standardized quantities
DLS Aramlietz	40.63	5182	-1.7366	1.1398
DGS Belitza	58.14	860	-0.5813	-0.7096
DGS Belovo	64.12	3175	-0.1867	0.2810
DGS Blagoevgrad	109.97	2521	2.8384	0.0011
DGS Breznik	71.8	3233	0.3200	0.3058
DGS Cherni Vit	69.78	1346	0.1867	-0.5017
DLS Dikchan	65.33	3694	-0.1069	0.5031
DGS Dobrinishte	47.61	81	-1.2760	-1.0430
DGS Dupnitza	64.46	2507	-0.1643	-0.0049
DGS Eleshnitza	39.04	450	-1.8415	-0.8851
DGS Elin Pelin	69.22	9504	0.1498	2.9893
DGS Etropole	56.26	1152	-0.7053	-0.5847
DGS Gotze Delchev	48.96	1119	-1.1870	-0.5988
DGS Gurmen	53.91	883	-0.8604	-0.6998
DGS Ihtiman	68.04	7888	0.0719	2.2977
DLS Iskar	66.69	2752	-0.0172	0.1000
DGS Katuntzi	79.05	8046	0.7983	2.3654
DGS Kostenetz	56.28	1063	-0.7040	-0.6228
DGS Kresna	56.07	911	-0.7179	-0.6878
DGS Kustendil	56.28	1063	-0.7040	-0.6228
DGS Mesta	44.54	130	-1.4786	-1.0220
DGS Nevestino	59.04	1656	-0.5219	-0.3690
DLS Osogovo	64.81	3334	-0.1412	0.3490
DGS Petrich	64.78	813	-0.1432	-0.7298
DGS Pirdop	60.4	4417	-0.4322	0.8125
DGS Purvomay	49.28	825	-1.1659	-0.7246

DGS Radomir	69.58	4031	0.1735	0.6473
DGS Razlog	32.87	1018	-2.2486	-0.6420
DGS Ribaritza	50.56	188	-1.0814	-0.9972
DGS Rilski Manastir	63.96	474	-0.1973	-0.8748
DGS Samokov	59.33	4092	-0.5028	0.6734
DGS Sandansky	70.28	3122	0.2197	0.2583
DGS Simitli	71.53	5721	0.3022	1.3705
DGS Slivnitza	67.23	2883	0.0185	0.1560
DGS Sofiya	65.18	6243	-0.1168	1.5938
DGS Strumyani	40.43	344	-1.7498	-0.9304
DGS Teteven	36.75	189	-1.9926	-0.9968
DGS Trun	56.5	645	-0.6895	-0.8016
DLS Vitoshko	65.26	1927	-0.1115	-0.2531
DGS Yakoruda	59.91	1355	-0.4645	-0.4978
DGS Zemen	63.24	2416	-0.2448	-0.0438

Source: UZDP and Authors Calculation

Through the standardized values from table 1 and application of formula (2) and formula (3) in table 2 is done ranking of TP of UZDP by level of competitiveness of broadleaf firewood sold from storage in 2018. The first three places by level of products competitiveness are occupied by the following TP – DGS Katuntzi (0.8860), DGS Elin Pelin (0.8815), DGS Ihtiman (0.8167). The first place of TP DGS Katuntzi is consequence by both second places of the forestry range by price of deciduous firewood (79.05 BGN/m^3) and sold quantity broadleaf firewood from storage (8046 m^3). Concerning the second and third places of TP DGS Elin Pelin and TP DGS Ihtiman they are determined respectively by the first place of TP DGS Elin Pelin by the sold quantity of firewood (9504 m^3) and the third place of TP DGS Ihtiman by the same sub-indicator (7888 m^3). At the same time at the bottom of ranking by the level of product competitiveness are as follows – TP DGS Eleshnitza (0.1431), TP DGS Razlog (0.1336) and TP DGS Teteven (0.1106). The main reason for the last places of the three forestry ranges by level of product competitiveness is the low price of the broadleaf firewood sold from storage – TP DGS Eleshnitza (39.04 BGN/m^3), TP DGS Teteven (36.75 BGN/m^3) and TP DGS Razlog (32.87 BGN/m^3).

Table 2. Ranking of TP of UZDP by level of competitiveness of deciduous firewood sold on temporary storage in 2018

№	TP	Assessment	№	TP	Assessment
1	DGS Katuntzi	0.8860	22	DGS Blagoevgrad	0.3387
2	DGS Elin Pelin	0.8815	23	DGS Yakoruda	0.3222
3	DGS Ihtiman	0.8167	24	DGS Petrich	0.2988
4	DGS Sofiya	0.6950	25	DGS Etropole	0.2913
5	DGS Simitli	0.6905	26	DGS Kostenetz	0.2850
6	DGS Radomir	0.5570	27	DGS Kustendil	0.2850
7	DGS Pirdop	0.5430	28	DGS Belitza	0.2785
8	DLS Dikchan	0.5164	29	DGS Kresna	0.2730
9	DGS Samokov	0.5145	30	DGS Rilski Manastir	0.2707
10	DGS Breznik	0.5018	31	DGS Gurmen	0.2607

11	DGS Sandansky	0.4898	32	DGS Trun	0.2557
12	DLS Osogovo	0.4878	33	DGS Gotze Delchev	0.2505
13	DGS Belovo	0.4733	34	DGS Purvomay	0.2321
14	DGS Slivnitza	0.4629	35	DGS Ribaritza	0.1944
15	DLS Iskar	0.4513	36	DGS Dobrinishte	0.1712
16	DLS Aramlietz	0.4265	37	DGS Mesta	0.1570
17	DGS Dupnitza	0.4252	38	DGS Strumyani	0.1455
18	DGS Zemen	0.4138	39	DGS Eleshnitza	0.1431
19	DLS Vitoshko	0.3845	40	DGS Razlog	0.1336
20	DGS Cherni Vit	0.3522	41	DGS Teteven	0.1106
21	DGS Nevestino	0.3405			

Source:Authors Calculation

CONCLUSION

In present paper based on the commodity and pricing approaches the timber competitiveness sold by TP of UZDP Blagoevgrad is measured on the basis of two sub-indicators: quality and price of timber. Relative criterion for product's quality is the maximum volume of realized timber from a given forest range. Of course in assumption that on the local/regional market the supplied quantity of timber is sufficient to satisfy the demanded one from the respective tree species and category. Concerning the price of timber in present paper is accepted the idea that the higher price is equivalent to the higher competitiveness of the supplied timber of course in assumption that the prices of the alternative products remain unchanged. On these grounds the complex quantitative assessment of the timber competitiveness normalized within certain boundaries from 0 to 1 is achieved through transformation of both sub-indicators mentioned above into unnamed values and linear arrangement in two-dimensional space in accordance with the coordinates of pattern point. The adequacy of the proposed approach for product competitiveness assessment is confirmed by the logic in the ranking of 41 TP of UZDP Blagoevgrad by the level of competitiveness of broadleaf timber sold from temporary storage in 2018.

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