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AUCTION IMPLEMENTATION OF OAK TECHNICAL ROUNDWOOS IN SREM FOREST AREA

SUMMARY

Financial investments in Srem forest area (SFA), despite small support of state, is achieved by providing funds from regular production in forests, whose primary purpose is the production of timber. The profit of a decade of work is implemented at the time of the sale of wood assortments. The maximum financial suficit in existing social - market conditions can be achieved by public sales of the technical roundwood (TRW). The aim is to study the SFA from the aspect of production and sale of TRW broadleaves. The study focused at determine the maximum gain and seller profit of TRW in existing market conditions and the legislative framework. The subjects of research are: production and sale of wood assortments in period of 1965-2015, which recorded a mild rising trend (production +0,4 % sale +0,5 %) in the analyzed period in the SFA, statistical analysis of produced structures TRW of common oak recorded a negative growth rate, that is especially high among the finest veneer (F) assortments (for F is -6,9 %), selection of the appropriate sales mode in the current conditions of increased demand and a trend of reduced supply of high quality and quality assortment of common oak.

Keywords: *Auction, timber trade, Srem forest area, roundwood, analysis.*

INTRODUCTION

Forestry is a relatively young branch of the economy and occurs as a resultant of two components: natural factors and socio - political conditions (Schmithüsen et al. 2006). Serbia is currently in the transition process, which involves a wave of radical socio-economic changes, for that purpose, the bid may serve as a way for selling, which would help wood market liberalization (Pajic, 2016). Sale by price-list, which ia today affected by state through various legal modalities (Rankovic and Keča, 2007, 2011), partially could be replaced by this method. Collected and processed statistics contribute to a more detailed consideration in the adjustment of sales method TRW, as the final forests product, for these purposes, in certain market conditions. The survey was created with the aim to introduce possible ways of trading with forest products in today's conditions. Achieving greater financial effects (Li and Perrigne, 2003; Roesch-McNally et al. 2016), and consequently a greater investment in sustainable forest

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management (SFA) can be succeed by changing the ways of sales. At the auctions of the high worth TRW might be achieved higher price per units, instead of sales by the price-list, and as well at the market all customers would be equal (Oreščanin and Redžić 199; Hagenberg, 1999; Ranković and Keča, 2011).

MATERIALS AND METHODS

In the research are used qualitative and quantitative methods of socio - economic sciences (Bernard and Bernard, 2012; Creswell, 2013). For this type of research, in order to determine a representative sample, the data are defined on production and sale of TRW oak in the SFA, produced assortment structure of TRW oak in the SFA. Data were collected in PE "Vojvodina šume" Petrovaradin, FE Sremska Mitrovica za 93,4 % surface of this area, for period between 1965 and 2015. For private forests (6,6 % areas of SFA) there are no reliable sources of information.

The subject of research is the SFA, which covers an area of 45,673 ha, with a wood volume of 11,640,096 m^3 (Forest management plan SFA, 2014). State-owned forests make up 93,4%, and were given for care and management to the PE "Vojvodina" Petrovaradin, Sremska Mitrovica FE, private forests cover 6.6% of the area. This ownership forest structure has focused research on state forests because they can be regarded as representative in this area. From the aspects ratio of tree species in the SFA, as the dominant species of forest management stands out Quercus robur which is spread over 22 844 ha, with a volume of 6 231 043 m^3 and a share of 53,5% in volume compared to other tree species. Mixed stands cover 65,89% of the area, while pure stands make up to 34,11%. Planned fellng quantity of common oak for the period between 2005 and 2014 amounted to 559 945 m^3 in gross volume, 68% of it make it volume yield, a 32% preliminary yield (Forest management plan SFA, 2014). Common oak is a natural resource of special value, includes preserved forests that generate significant income through their sustainable use (Medarević, 2006). The demand for them in the last decades is beyond of production (Internal documentation of commercial services PE "Vojvodinašume" Petrovaradin FE Sremska Mitrovica, 2016).

Menagment and finance PE in Serbia is defined by the Law on Forests, Law on Nature Protection and Law on Public Enterprise. The last law regulates the relationship with the founder. It adopts programs of management, business reports, price list of products and services, advertising and other acts which the PE must confirm. If we analyze the structure of business revenue it's obvious that 83,77% of income (Independent Auditor's Report, 2016) PE "Vojvodina šume", FE Sremska Mitrovica in the period 2006 - 2015 comes from sale of goods and services, and only 2,84% of the subsidies, donations, grants and premiums (Independent Auditor's Report, 2016). Wood sale is made on the basis of the applicable price-list by contract. The way to achieve higher incomes in the existing legal framework is open competition, a bid TRW (Li and Perrigne, 2003). The study analyzes the production and sale of TRW common oak in state

forests of SFA for the period 1965 - 2015, as well as the assortment structure of TRW in the last 20 years (between 1996 and 2015).

RESULTS AND DISCUSSION

By observing the period of production and sales of the last 50 years (1965 - 2015) it can be concluded that the average production of TRW common oak ranges from 18 000 to 22 000 m^3 annually in state forests SFA and sales followed production. There are no problems for the placement of these products (Internal documentation of commercial services PE "Vojvodina šume" Petrovaradin FE Sremska Mitrovica, 2016). Statistical analysis showed that production and sales have the linear trend and recorded a slight increase, the annual rate of exponential growth of production is 0,4% and 0,5% of sales. Production and sales of this assortment are stable without significant fluctuations (Table 1).

Table 1. Statistical analysis of the production and sale of TRW of oak for the period 1965 - 2015

Production of TRW of oak						
Parameters		*T*	*R*	*F*	Y= 85,767x - 150052	
a	-150052	-1,26372	0,201153	2,066279		
b	85,7667	1,437456			Annual exponential growht rate	0,40%
Sale of TRW of oak						
Parameters		*T*	*R*	*F*	Y= 94,198x - 166909	
a	-166909	-1,37897	0,216027	2,398647		
b	94,19819	1,548757			Annual exponential growht rate	0,50%

This paper analyzes the produced assortment structure TRW of common oak in the SFA in state forests for the period between 1996 and 2015, and the following results are:

The analysis of the production of veneer logs of common oak we get a second degree polynomial, with a strong correlation relationship (0,917) and the correlation coefficient is statistically significant, as indicated by an error of about 0,05% (*Significance F*), the parameters are significant (for the level of faults α=0,05%) as the corresponding *P-value* indicates an error of about 0,05%. The growth rate is negative and amount to -6,9% (Figure 1).

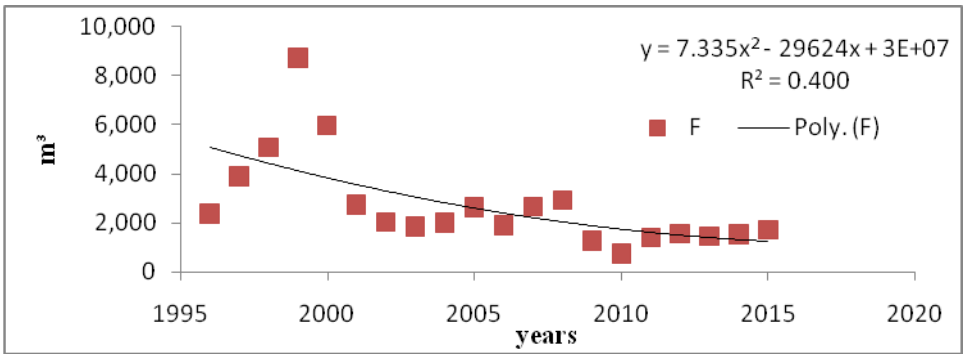

Figure 1. Production of veneer logs of common oak, SFA

Production of class I sawmill logs of common oak is represented by a polynomial of the second degree, with a strong bond correlation (0,927) and the correlation coefficient is statistically significant, as indicated by an error of about 0,000005% (*Significance F*), the parameters are significant (for the level of faults α=0,05%) as the corresponding *P-value* indicates an error of about 0,00007%. The growth rate is also negative and amount to -4,0% (Figure 2).

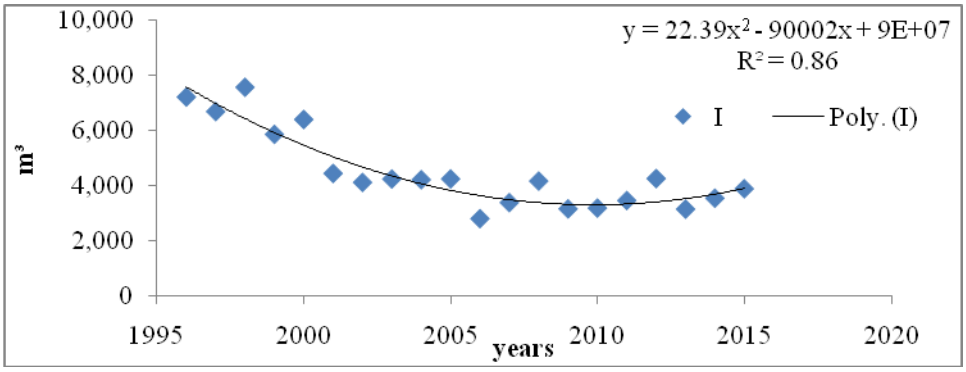

Figure 2. Production of class I sawmill logs of common oak, SFA

In the production of sawmill common oak class II the polynomial of the second degree is obtained, with a strong bond correlation (0,932) and the correlation coefficient is statistically significant, as indicated by an error of about 0,00003% (*Significance F*), the parameters are significant (for the level of faults of α=0,05%) because the corresponding *P-value* indicates an error of about 0,02%, the growth rate is negative and amount to -4,4% (Figure 3).

Production of sawmill logs of common oak III class is a polynomial of the second degree with a strong correlation relationship (0,834) and the correlation coefficient is statistically significant, as indicated by an error of about 0,004% (*Significance F*), the parameters are significant (for the level of error of α=0,05%) as the corresponding *P-value* indicates an error of about 0,2%. The growth rate is also negative and amount to -3,6% (Figure 4).

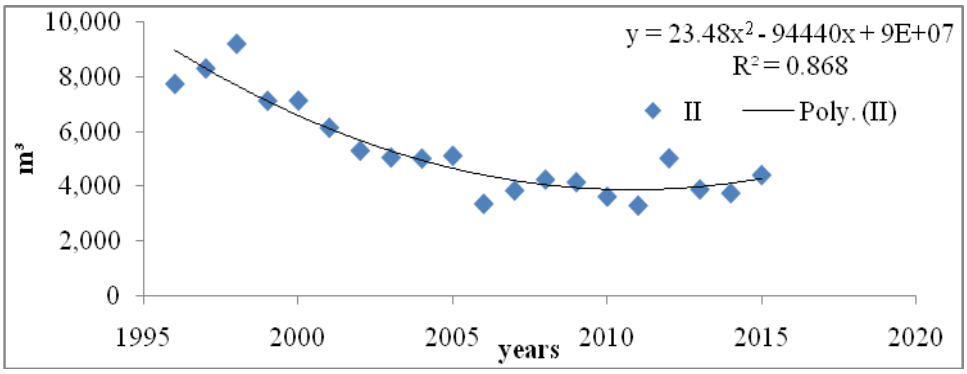

Figure 3. Production of II class sawmill logs of common oak, SFA

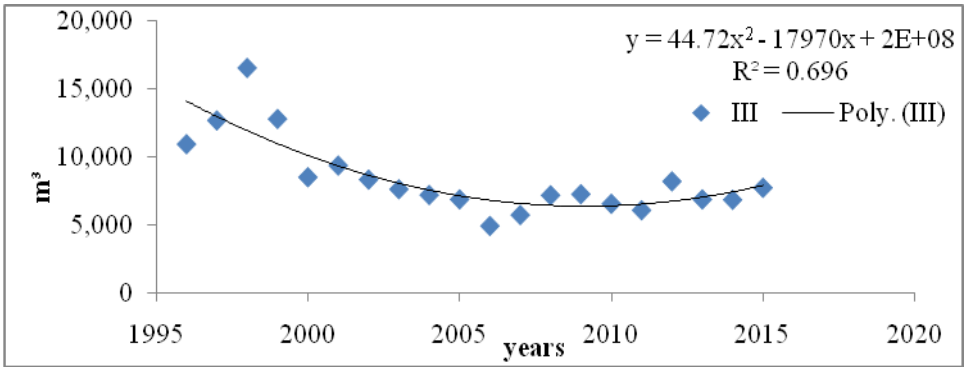

Figure 4. Production of III class sawmill logs of common oak, SFA

If we look at the production of TRW common oak as a whole, we get a polynomial of the second degree, with a strong correlation (0,839) and the correlation coefficient is statistically significant, as indicated by an error of about 0,0000003% (*Significance F*), the parameters are significant (for error level of α=0,05%) as the corresponding *P-value* indicates an error of approximately 1%, and the rate of -3,6% (Figure 5).

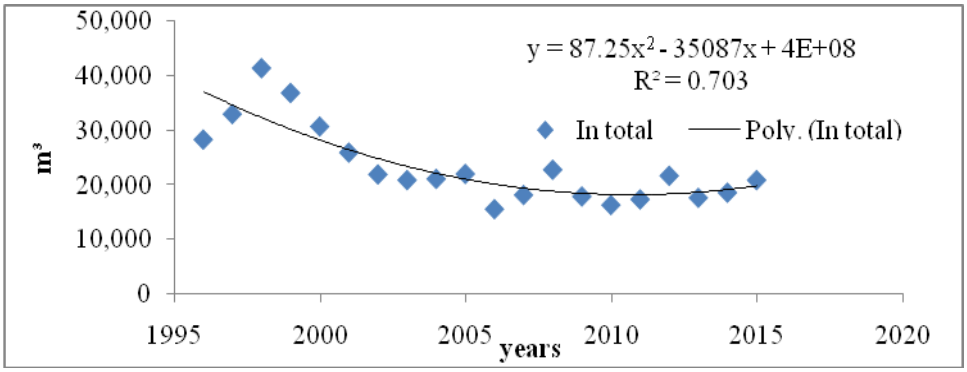

Figure 5. Production TRW of common oak, SFA

Over 90% of income is realized through the sale of TRW in the domestic market, but only a small part abroad and mostly for products for which there is sufficient demand in the same (soft pulpwood Hardwood) (Keča et al., 2009).

All wood processors that supply from the SFA have the capacity significantly larger than the current production volume, which means that, if necessary, they can processed more raw material (Pajić, 2016). Forest yield opportunities are less than the total processing capacity in the forest area, which their needs for raw materials complement from other forests. Even a significant increase in yield from the forests of this area would not lead to problems in the placement on the market (Internal documentation PE „Sremska Mitrovica“, 2016). From the above, it follows that all interested buyers, the fair competition in the auction would allow them reach the desired goods, which is not enough in the market, and is conditioned by the fact that the offer is limited in quantity and can not be increased (respecting the principles of sustainable development) (Schmithüsen et al., 2006; Medarević, 2006, Ranković and Keča, 2011).

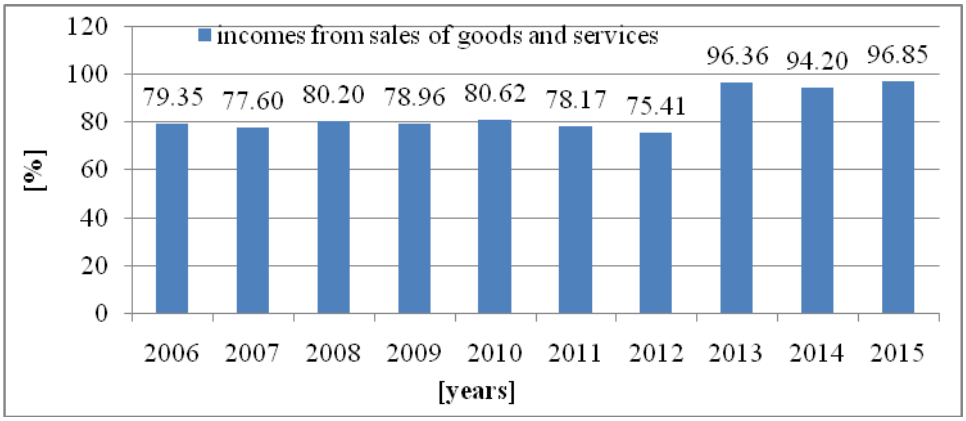

Figure 6. The share of incomes from sales and services in the total all revenues

The method of comparing income (Schmithüsen et al., 2006), which belongs to the static methods of investment calculations, can help in the assessment of PE able to identify the bid as a way of selling. This method takes into account, under the assumption of equal cost, the difference in expected incomes. From more investment opportunities, the variant that offers the highest profit is selected. Procedure for the comparison method is similar to the method of comparing costs. Expected profit can be calculated per unit of product [m^3], is useful for simple investments (Schmithüsen et al., 2006). If we take into account that the cost of production TRW are same regardless of the method of sale, that the initial price is formed based on the current value of assortments (the value of the lot is calculated according to the current price list, a value per unit obtained when the value is divided by quantity) we conclude that no significant increase of the initial price the company would realize a profit, because the cost of sales do not increase significantly. In situations of high demand and low supply of goods

on public sales growth trend is seen price growth trend and then sellers, as opposed to customers, prefer public sale (Hagenberg, 1999; Schwartz, 2012).

Sales of goods can be regarded as one of the functions of goods trade, but also as the second phase of the reproduction process, which follows the stages of production (Oreščanin and Redžić, 1994), which should be maximizing the seller's income. Situation on the market and the quality of the wood determines the type and volume of sales. Each of the methods has its advantages and disadvantages in certain market conditions (Oreščanin and Redžić, 1994; Hagenberg, 1999). In this case, the high quality and quality TRW common oak for which there is an increased demand, production is limited with feeling volume and cannot be increased. Based on the statistical analysis of assortment structure, that shows negative growth race, -3.6% average for all assortments, we can conclude that there will still be an increased demand due to reduced supply. These conditions correspond to the selection of the bid, as a sales method that would achieve the maximum financial effect (Oreščanin and Redžić 1994; Hagenberg, 1999; Rankovic and Keča 2011; Trifunovic, 2012) in the existing legislative framework of a market in Serbia. On the markets of the seller is in the forefront of the type and quantity of offers and products traded. For forest holdings in the markets of the seller, due to the fact that there is a lack of resources, these conditions put them in an advantageous position and enable them to earn more income from the sale of TRW through the auction, reduced for the cost of conducting auctions (Schmithüsen et al., 2006).

CONCLUSIONS

From exposed statistical analysis can be concluded that the production and sale of TRW from SFA stable without significant fluctuations. There is a negative growth rate of production for all assortments of common oak (F, I, II i III klasa). Practically every year, if it continues this trend offers will be lower, and on the other hand we have the growing demand. In such cases when supply is less than demand, the bid should be practiced as a way of sales, in order to achieve greater financial effects. This conclusion is justified by the fact that the sales of products and services is base of income of the enterprise, and achieving the maximum financial effects of the sale, in the existing legal framework, is possible in public sales.

The results can be successfully used as a basis for further research on the relationship between supply and demand in the sphere of auction. The results obtained in this way can be added to new influencing factors and construct a new, more complex models, and can be carried out and additional research that would more suit the nature of the observed values.

REFERENCES

(1965 – 2016): *Internal documentation of commercial services and services of forest management planning PE Vojvodinašume Petrovaradin, FE Sremska Mitrovica*, PE Vojvodinašume Petrovaradin, Serbia

(2006 - 2016): *Izvestaj nezavisnog revizora*, JP Vojvodinašume Petrovaradin, http://www.vojvodinasume.rs/publikacije-kategorije/izvestaji (pristupljeno novembar 2016)

(2014): *Opšta osnova Sremskog šumskog područja 2005-2014*, JP Vojvodinašume Petrovaradin, ŠG Sremska Mitrovica, Srbija

Bernard H. R. (2012): *Social research methods: Qualitative and quantitative approaches*, Sage.

Creswell J. W. (2013): *Research design: Qualitative, quantitative, and mixed methods approaches*, Sage publications.

Hagenberg K. (1999): *Guidelines for the strengthening and establishment of log auction systems*, Roma, FAO.

Keča Lj., Ranković N., Pajić S. (2009): *Analysis of commercial profitability of poplar plantations aged 29 years applying some methods of investment calculation*, Works of the Faculty of Forestry University of Sarajevo, Vol.1, Sarajevo (53-62).

Li T., Perrigne, I. (2003). *Timber sale auctions with random reserve prices, Review of Economics and Statistics*, 85(1), 189-200.

Medarević M. (2006): *Planiranje gazdovanja šumama*, Univerzitet u Beogradu – Šumarski fakultet, Beograd (1-401).

Oreščanin D., Redžić A. (1994): *Trgovina drvetom*, Univerzitet u Beogradu - Šumarski fakultet, Beograd (7-10)

Pajić S. (2016): *Istraživanje mogućnosti prodaje tehničkog oblog drveta licitacijom na području Ravnog Srema*, Univerzitet u Beogradu - Šumarski fakultet, Beograd (Magistarski rad)

Ranković N., Keča Lj. (2011): *Trgovina i marketing šumskih proizvoda*, Univerzitet u Beogradu - Šumarski fakultet, Beograd.

Ranković N., Keča Lj. (2007): *Šumarska politika Srbije*. Univerzitet u Beogradu, Šumarski fakultet.

Roesch-McNally G. E., Rabotyagov S., Tyndall J. C., Ettl G., Tóth S. F. (2016): *Auctioning the Forest: A Qualitative Approach to Exploring Stakeholder Responses to Bidding on Forest Ecosystem Services, Small-scale Forestry*, 1-13.

Schmithüsen F., Kaiser B, Schmidhauser A., Mellnghoff W.A. (2006): *Preduzetništvo u šumarstvu i drvnoj industriji, Osnove menadžmenta i poslovanja*, Centar za izdavačku delatnost Ekonomskog fakulteta, Beograd.

Schwartz R. A. (Ed.). (2012): *The electronic call auction: Market mechanism and trading: Building a better stock market* (Vol. 7). Springer Science & Business Media.

Trifunović D. (2012): *Aukcije*, Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu (4-8, 225).