



## Factors influencing forest owners and manager's decision making about forestry services in logging-transport process

Faktory vplývajúce na rozhodnutia vlastníkov a obhospodarovateľov lesov o spôsobe zabezpečovania lesníckych služieb v ťažbovo-dopravnom výrobnom procese

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### Abstract

The aim of the paper is to present an overview of the forestry services market in Slovakia in terms of forestry services customers and to identify key factors determining existence and functioning of the market in the sphere of logging transport process. Methodically the paper is based on case studies elaborated on the basis of standardised interview carried out with selected forest owners and managers. As shown by the results, crucial factors influencing decision making about forestry services are machinery and technological equipment of forest enterprises, availability of financial resources, amount of performed work, production and transaction costs and legal constraints resulting from the Act on Public Procurement. The results of the questioning and case studies allowed defining basic economic assumptions of the forestry services market functioning under the current conditions in Slovak forestry.

**Keywords:** outsourcing; forestry services market; transaction cost; logging-transport process

### Abstrakt

Cieľom predkladanej práce je poskytnúť prehľad o fungovaní trhu s lesníckymi službami na Slovensku z hľadiska objednávateľov služieb a identifikovať kľúčové faktory, ktoré determinujú opodstatnenosť existencie a fungovania trhu s lesníckymi službami v segmente ťažbovo-dopravného výrobného procesu. Metodicky je práca založená na metóde prípadových štúdií vypracovaných na základe dopytovania s vybranými objednávateľmi lesníckych služieb. Na základe dosiahnutých výsledkov možno za rozhodujúce faktory vplývajúce na rozhodovanie o spôsobe zabezpečovania lesníckych služieb považovať vybavenie podnikov potrebnou technikou a s tým súvisiacu dostupnosť kapitálu, objem vykonávaných prác, výšku výrobných a transakčných nákladov a legislatívne obmedzenia vyplývajúce zo zákona o verejnom obstarávaní. Výsledky dopytovania a prípadových štúdií umožnili definovať základné ekonomické predpoklady fungovania trhu s lesníckymi službami v aktuálnych podmienkach lesného hospodárstva na Slovensku.

**Kľúčové slová:** outsourcing; trh s lesníckymi službami; transakčné náklady; ťažbovo-dopravný proces

## 1. Introduction

Requirements on effective performance of activities and their optimisation lead enterprises to strategic decisions, according to which they transfer performance of some corporate activities to external entities, which are able to carry them out in a higher quality and with lower costs. They use some form of outsourcing. Outsourcing refers to a process of functional and inter-organisational division of labour, by which enterprise functions previously performed in-house are transferred to legally independent i.e. external business entities. As a result of outsourcing these functions are wholly carried out by external contractors (Daňo et al. 2005).

Outsourcing principles in terms of long term contractual use of external services are known from economic theories of transaction costs. Breakthrough in the development of outsourcing from the perspective of economic theories can be ascribed to works of Coase (1937) and Williamson (1981). According to Coase (1937), achievement of efficient resources allocation in economy is possible, if property rights are well determined and then effectively enforceable, with

very low bargaining costs. Generally, these costs have been named as transaction costs. Williamson (1981), who significantly followed up on Coase (1937), claims in his work, that managers, when deciding on projects, should consider the proportion of production and transaction cost of monitoring, control and transactions management.

Several domestic as well as foreign authors deal with the issues of outsourcing: Bacher (2000), Hodel et al. (2004), Brown & Potoski (2005), Strišš (2005), Rydvalová & Rydval (2007), Daňo & Trenčianska (2008), Dvořáček & Tyll (2010), Potkány (2011a, 2011b).

In forest management, as in other sectors of economy, a business sphere providing forestry-related services to forest enterprises was also created. The change in ownership in Slovakia was the decisive factor during the process of economic transformation that had a strong impact on forestry services market formation and innovation development of enterprises providing forestry services.

The original owners, who got back their tenure and property rights to forest land, encountered problems in carrying out forestry operations themselves because they lacked

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even basic equipment. In the state forest sector, due to the optimisation of management structures and production processes, a significant decrease in the number of internal employees has been observed. These changes initiated the establishment of business entities that have begun to cooperate with forest owners and managers through outsourcing. The manner of carrying out forestry operations performed by internal employees and own capacities switched to contractual form provided by private forestry services contractors.

Recently, according to official data, more than 95% of felling and skidding operations and around 70% of activities performed in timber hauling is carried out externally, by independent business entities. In comparison with the year 2000, the volume of outsourced operations is more than double.

At present, especially in foreign countries, but also in Slovakia, the research has focused on outsourcing and business sector in forestry, as is proved by several publications: Rumukainen et al. (2006), Sarvašová & Svitok (2006), Paluš et al. (2010, 2011, 2012), Penttinen et al. (2010, 2011), Bouriaud et al. (2011), Kaputa et al. (2011), Ambrušová & Marttila (2012), Soirinsuo (2012), Ambrušová (2013) and others. However, it should be noted that previous studies focused primarily on forestry services contractors, while the issues of forest owners or managers in position of forestry services customers and their make or buy decisions have been solved so far very marginally.

The aim of the paper is to provide an overview of the functioning of the forestry services market in Slovakia from the perspective of service customers and to identify key factors determining the existence and functioning of the market in the sphere of logging-transport process.

## 2. Material and methods

Methodology for the investigation of factors influencing decision making about forestry services is derived from similar researches dealing with forestry services market survey in the area of silviculture and felling operations (Paluš et al. 2011) and survey of market conditions and innovation activities of enterprises providing services in forestry (Bouriaud et al. 2011, Kaputa et al. 2011).

The primary method for achieving the objectives of qualitative research was a case study method. The case study is a method that is able to fulfil the basic aims of qualitative research by examining a current phenomenon in depth within its real context, especially in cases when the boundaries between phenomenon and its context are not quite clear (Yin 2009). In particular, a method of multiple case studies was used, i.e. every owner or manager of forest land represented a separate case study.

Scientific methods of observation and questioning were applied as a basis for case studies elaboration. Relating to form of communication with respondents, questioning by interview was used. Depending on the chosen method of qualitative research, respondents were selected purposefully with respect to ownership type. Ownership is a significant economic category, which is the basis for social and economic relations. Each production method is characterised by certain peculiarities which result from the nature

of ownership and their knowledge gives the opportunities to explain and understand real existing processes in economy and society (Demsetz 1967). Interview was realised with ten respondents, of which eight were representatives of non-state subjects and two representatives of state forest organisations. Within a non-state forest sector, a significant proportion of forest managers represent land associations which manage more than 0.5 million hectares of forests in Slovakia, therefore these entities form a substantial proportion of respondents. Basic characteristics of respondents are shown in Table 1.

**Table 1.** Basic characteristics of selected forestry services customers.

Enterprise	Ownership	Legal form	Number of employees	Area of forest land [ha]	Volume of annual felling [m <sup>3</sup> ]
1	Community	land association	3	223	1 000
2	Community	land association	1	346	1 530
3	Community	land association	5	446	630
4	Community	land association	18	470	1 207
5	Community	land association	3	661	1 900
6	Municipal	Ltd.	8	1 560	6 000
7	Municipal	Ltd.	12	1 850	17 000
8	Municipal	Ltd.	31	7 520	31 600
9	State	state enterprise	116	31 931	180 000
10	State	state enterprise	103	34 810	148 000

Interviews were carried out by standardised questionnaires with the exact order and number of questions. The questionnaire consisted of 25 questions, of which 22 were open and allowed to obtain comprehensive information and make a complete framework of the topic. The questions were divided into the following seven areas:

1. Characteristics of forestry services customers. Basic characteristics of forest owners or managers in terms of ownership type, legal form and human resources. It also includes a description of managed forest land, average annual volume of felling, structure and proportion of activities performed in logging-transport process by contractors.
2. Reasons for outsourcing. The aim of this part of the questionnaire was to find out the reasons why forest enterprises choose to outsource forestry operations in felling, skidding and timber hauling. If enterprises are unable to perform given operations in-house, we investigated the reasons that prevent them from doing so.
3. Transaction costs. This part of the questionnaire was focused on the identification of conditions under which it is convenient for enterprises to carry out forestry operations internally and when it is more advantageous to use contracting of forestry services. Theory of transaction costs in a new institutional economy says that transaction costs should also be considered when deciding on the mode of providing the service besides the traditional production costs. In some cases, transaction costs can go beyond the savings from production costs reached by contracting (Brown & Potoski 2005). Under transaction costs we understand all the costs associated with contracting besides production costs, i.e. cost of contractor selection; bargaining; preparation and conclusion an

agreement; monitoring compliance; and resolving disputes over non-compliance.

4. Social, environmental and legislative factors influencing decision making about forestry services. In addition to economic criteria, decisions between internalisations and externalisations of forestry services can be influenced also by other factors, e.g. social factors (un/employment of own staff), environmental requirements for forestry services contractors, legislative measures influencing forest owners or managers' demand for forestry services and eventually other potential factors.
5. Problems of the forestry services market in Slovakia. In the last section of the questionnaire respondents had an opportunity to assess the forestry services market in Slovakia and to define the main problems of the market.

The answers from the questionnaires were processed in the form of case studies. Altogether ten case studies for different categories of forest owners and managers were elaborated. Consequently, the method of data analysis of individual cases and their detailed comparison was used when processing the results of the case studies. The methods of scientific abstraction, induction and deduction were used as well.

The achieved results allowed us to propose a model of the forestry services market which defines basic assumptions of the existence and functioning of the market in the actual conditions of Slovak forestry. Moreover, it was possible to answer the following scientific questions:

1. What reasons lead forest enterprises to outsource forest operations in logging-transport process?
2. What factors and how do they affect forest enterprises' decision making about forestry services in logging-transport process?
3. How does ownership type affect enterprises' decisions on forestry services?
4. What is the relationship between transaction costs associated with forestry services contracting and ownership type?
5. What are the basic assumptions of the functioning of the forestry services market in the actual conditions of Slovak forestry?

### 3. Results and discussion

#### 3.1. Reasons for carrying out activities in logging-transport process by contractors

Nowadays, regardless of ownership type, almost all forest operations in timber harvesting (except timber hauling) are carried out by contractors. It should be emphasised that, according to outsourcing theory, complementary or supporting activities that are not related to the main purpose and the main activity of the enterprise - so called core business are usually bought as a service from external contractors. However, in the case of forestry, main production activities are outsourced, which is contrary to the declared mission and intended use of external services as it is stated in the literature, e.g.: Bacher (2000), Hodel et al. (2004), Rydvalová & Rydval (2007), Dvořáček & Tyll (2010). The following results based on the qualitative research explain why forest

land owners or managers decide to have main forest activities performed by external service providers.

All interviewed entities, except for one enterprise, were not able to perform forestry operations in-house. The main obstacle which prevents them to do so is the lack of necessary equipment and technology or out-of-date mechanisms. A significant part of used machinery is physically and morally out-of-date and their further use in the production process results in the lower quality of performed work and increased costs of maintenance and repairs of machines which negatively affects profits of enterprises.

Nearly half of the respondents did not own any mechanisms. High acquisition costs needed to purchase new machinery are another significant limiting factor. The acquisition of new modern machines and technology is mostly a matter of financial resources that are often lacking in forestry enterprises. Forest owners or managers do not have enough internal financial resources. The bulk of their income is mainly from wood sales, the amount of which depends on price development in the timber market. Decline in timber prices due to the excess of wood supply over demand causes serious existential problems for forest enterprises. Moreover, it should be noted that the timber market in Slovakia is very specific because it is influenced by the dominant position of the state enterprise which basically sets price strategy what deforms the market in many cases.

Restricted access to bank loans is a hampering factor for investment and subsequent development of forest enterprises. Forest enterprises currently use external financial resources minimally. Interest rates for business sector are increasing due to no confidence and increasing risk charges, which causes problems for enterprises because of increasing financial costs. Other factors that restrict access to bank loans are associated with strict bank credit standards and high collateral required to secure loans. Furthermore, as results from the financial analysis carried out by Hajdúchová et al. (2013), enterprises in non-state forestry sector are usually undercapitalised. It means that the part of the fixed assets is financed by current assets, which causes the discordance between the stock turn rate of assets and term of liability payment. In case the enterprise will not be able to ensure the maturity of liabilities in required terms, the financial costs will increase rapidly which can lead to negative profit and threat to enterprise's financial stability.

One of the main reasons of choosing contracted services in logging-transport process is reduction of production costs as well. Decreasing trend in forestry services price development allows enterprises to achieve lower costs of outsourced operation compared to the costs of performing activities in-house.

The reasons to outsource forestry activities to external service providers also include rationalisation measures related mainly to large enterprises. In relation to management structures optimisation and production processes in large businesses, the number of own employees in the category of forest workers has decreased. They have moved to external environment and begun to cooperate with enterprises through outsourcing. The transition to outsourcing results in simplified work organisation, which is another reason for contracting forestry services out to private entrepreneurs.

Small enterprises decide to outsource forest activities mainly because of the low volume of work associated with the inefficient use of own machines, as well as due to the lack of human resources because the low work volume does not allow permanent employment of their own staff.

According to the study of Paluš et al. (2011), the seasonality of work performed, accidental felling, weather conditions, use of certain technologies, etc. have also significant impacts on contracting forestry activities out. The effectiveness of internalisation of intensive work on human resources, materials and technological equipment of forest enterprises is directly related to the possibilities of their use during the whole year.

The above-mentioned findings clarify why forest enterprises carry out main activities by external contractors. We can also take into account an assumption that forest owners or managers perceive the activities which produce revenues as the core business, therefore wood sale or manipulation are usually not outsourced.

### 3.2 Factors influencing decision making about forestry services

#### Impact of ownership type and legal form of entities

In the countries that have undergone the transition period of their economies, the most significant factors were those connected to the structure of property rights. These changes brought new decision on internalisation and externalisation of forestry operations (Kaputa et al. 2011).

Based on the result of the case studies, it can be stated that a degree of decentralisation of decision making processes is a very important factor in the case of state enterprises. Decisions at a lower level of management relating to contractual relationships with suppliers of forestry services are subordinated to decisions of top level management. In addition, it should be noted that there is a specificity of state enterprises regarding to the administration and management of non-state unclaimed forests in which timber harvesting and subsequent monetisation of produced wood cannot be fully realised due to the prohibition of reputed forest land owners.

In the case of land associations, there is a problem regarding to owners' fragmentation and divergent or conflicting interests of members which often lead to inability to reach an agreement or uniform decisions in relation to contracting services. However, it is important to distinguish between land associations with and without the status of corporate entity. A land association with legal entity is a typical corporation with clearly defined competences of management bodies. On the contrary, a land association without legal entity is based on a free association of physical persons who are the owners of common property. Such an association is not a legal person therefore it cannot act on its own behalf. Decisions relating to contracting are realised directly through

collective resolutions or indirectly through one authorised representative. According to the theory of property rights, ownership structures are effective if property rights are clearly defined and transferable (Demsetz 1967). Limited divisibility and transferability of property rights in case of land associations without legal entity lowers the effectiveness of such legal form of business.<sup>1</sup>

As regards to trading companies, decision making about contractual relationships with service suppliers can be significantly influenced by interests or priorities of owners which may differ in case of physical persons and legal persons or if it relates to municipalities (as in our case).

#### Transaction costs and ownership type

When deciding between internalisation and externalisation of forestry services it is necessary to deal with the issue of transaction costs, as it is referred by several authors, e.g. Williamson (1981), Brown & Potosky (2005), Meričková et al. (2010). The theory of transaction costs in a new institutional economy emphasises the need to consider not only production efficiency, but also the amount of transaction costs associated with the mode of service provision. In some cases, transaction costs can go beyond the savings of production costs reached by contracting. Although some alternatives of service externalisation seem to be convenient with regard to production efficiency, high transaction costs can change the final decision on service contracting.

As results from the case studies, when deciding whether to outsource forestry operations or not, forest owners or managers take transaction costs of contractor selection, bargaining, monitoring and controlling compliance into account. The respondents indicated the amount of transaction costs in the range of 7–30% of the total cost associated with the performance of forestry operations externally. The amount of transaction costs which is relevant in decision making about forestry services is influenced by several factors such as an ownership type or legal form of business.

In state enterprises, decisions of individual organisational units are subordinated to decisions of top level management. If decisions on contractual relations are carried out at several levels of management (as in the case of state enterprise), transaction costs increase. Moreover, under particular legislative provisions state enterprises have an obligation to manage forest land of unidentified owners. In case of not clearly defined ownership structure, transaction costs will increase.

In comparison with the state enterprise organised in a form of three-level management, the advantage of private ownership is a more flexible organisational structure that ensures a higher degree of flexibility in decision making processes leading to lower transaction costs.

As regards the non-state forest sector, it is necessary to draw attention to land associations without legal entity. Unclear relations in the functioning of these associations and

<sup>1</sup> By adopting the Act No. 97/2013 on Land Associations in May 2013, establishment of land association without legal entity is forbidden. Existing land associations without the status of corporate entity had to be transformed into associations with legal entity till the end of February 2014.

limited possibilities to enforce property rights lead to higher transaction costs.

When customers of forestry services conclude a contract with a new service provider, they frequently make decision on the bases of the references from other customers who have already cooperated with the contractor. This can lead to increased transaction costs of finding and gathering information on potential forestry services contractors. However, recently the forestry services market in Slovakia has been characterised by oversaturated supply which results in lower transaction costs of finding service suppliers. These costs are lower also in the case of concluding contracts with the same contractor. Based on the results of the case studies, it can be stated that the forestry services market in Slovakia is based on long-term relationships. When forest owners or managers make an agreement with the same, stable contractors, they try to conclude long-term contracts, which is typical for private ownership. Long-term partnership is the best solution in the environment of uncertainty. Nevertheless, the authors Bouriaud et al. (2011) and Penttinen et al. (2011) point out a trend aiming at replacing the long-term relationships by tendered contracts for services, which fairly often do not respect or favour trustful past cooperation, but just the actual price offer. This is a huge threat for locally existing business networks.

### **Impact of legislative, social, ecological and environmental factors on decision making about forestry services**

The state enterprise as well as trading companies managing forests of municipalities, when bidding for forestry services, are influenced by legislative factors or constraints which result from the Act on Public Procurement. When these enterprises award a contract for service provision, they have to call for tenders and proceed in accordance with relevant provision of this Act. Difficulty of the public procurement process and relating higher administrative burden of these enterprises can lead to higher transaction costs. In addition, the price is the main criterion for supplier selection and therefore enterprises have to accept the lowest price offer. It happens that the service supplier who obtains a contract has insufficient technology or human resources and has to perform contracted operations with subcontracting other subjects. Subcontractors are usually small family enterprises or sole traders and they often carry out forestry operations at unacceptable prices which have a negative impact on the quality of performed work and also on work safety. As results from the case studies, due to disproportionately low prices, forestry services contractors are not able to meet the agreed conditions and provide services in the required quality and within the deadline. Subsequently, enterprises have to cease cooperation with the supplier which results in incurred transaction costs of additional public procurement.

On the contrary, private enterprises do not have an obligation to choose a contractor with tendering system which results in lower transaction costs.

According to Paluš et al. (2011), significant legislative factors are also restrictions resulting from the two basic legal regulations – the Act on Forests and the Act on Nature and

Landscape Protection that have a particular importance in cases when the subject of the contract are operations performed in territories under 4th and 5th degree of protection.

The demand for forestry services is influenced also by social factors and environmental requirements of customers.

The impact of social factors on decision making about forestry services is minimal in case of un/employment of own staff. However, many cases revealed that customers prefer local forestry services contractors to support employment in the given region.

Despite the fact that studies of Brogt et al. (2007) and Bouriaud et al. (2011) point out increasing requirements of customers for the use of modern environmentally friendly technologies, preferring the contractors that possess up to date, environmentally friendly technologies, was not clearly confirmed in Slovakia. Although when choosing a supplier, respondents take into account ecological factors to some extent, the price of the service is still decisive.

The results revealed that customers have specific requirements in relation to nature protection, usually the use of ecologically degradable oils in machinery. In some cases, specific requirements are related to forestry operations conducted in flysch zone, cableway terrain, and hygienic protection zone. In two cases, requirements resulted from forest certification.

### **Problems of forestry services market**

One of the main problems of the forestry services market identified by the respondents was the quality of provided services. The forestry service market in Slovakia is characterised by oversaturated supply causing that not all entrepreneurs in forestry have the possibility to gain a contract on service provision. Due to prevailing supply of services over demand the bargaining position of forest owners is stronger in negotiation of price and other contractual conditions. Forestry services contractors are more or less forced to adapt to them. It is obvious that weak bargaining position of forestry contractors is a common problem of the market in several European countries as demonstrated by the studies of Bouriaud et al. (2011) and Rummukainen et al. (2006). Contract prices are in many cases low which restricts investments of contractors in new technology. Forestry contractors in Slovakia provide forestry services at minimal prices that barely cover their rising costs so they lack the financial resources for the renewal of machinery. Moreover, recently, short-term contracts predominate what leads to higher risk relating to purchase and repayment of new technology. Therefore, technological equipment of contractors is lagging behind the needs and requirements of modern forest management. The use of obsolete technology is reflected in the lower quality of provided forestry services which results in e.g. losses of harvested wood, reduced income from timber sale, low labour productivity, increased production costs, as well as increased damage of forest stands and inappropriate ergonomic parameters of work.

Development trend of the forestry service market will lead in the future to increased pressure on sustainable forest management and technological changes. Future development of the market will focus mainly on the improvement of services supply also because of high competition between

contractors. In addition, the forestry services market is open also to foreign entrepreneurs. Currently, the subjects providing services to forestry in Slovakia are less competitive than foreign contractors which have up-to-date technology and equipment. This fact can adversely affect employment in rural areas.

A certain solution of this problem would be an active establishment of business entities through pooling of sole traders that become real partners for the supply of a complex of forestry activities. Another solution is an effort to conclude long-term contracts. The studies of Kaputa et al. (2011) and Paluš et al. (2011) reported a minimum period of five years to guarantee the return of investment.

A further problem of the forestry services market is imperfect legislation in the area of public procurement. The current system of public procurement is not satisfactory since even a company, who does not possess any equipment and is not able to provide the service, can obtain a contract. Therefore, in the Act on Public Procurement it is necessary to define exactly the extraordinary low bids which are unrealistic and do not guarantee meeting of deadline and required quality of service provision.

As follows from the results, the other problems of the forestry services market in Slovakia include weak law enforcement, lack of skilled workers and limited possibilities of implementation of environmentally friendly methods in the shelterwood management system mainly due to the insufficient forest road network.

### 3.3. Model of functioning of forestry services market

The basic decision of forest enterprises considering the mode of service provision is between externalisation and internalisation of services. It means that forest enterprises decide whether to carry out given forestry activities using their own capacities or transfer them to external contractors for remuneration. This decision problem is known in economic theory as “make or buy” decision. Based on the results obtained from the qualitative research a model of the functioning of the forestry services market was proposed. The model defines basic assumptions of outsourcing and insourcing utilisation. The model presented in Table 2 is guidance for forest owners or managers in decision making on the use of external or internal forestry services.

The level of production costs and production effectiveness is an important factor influencing decision making about forestry services. Reduction of production costs and achievement of higher effectiveness is one of the main reasons why forest enterprises use contracted services. If the costs of performing activities in-house are higher compared to costs of activities carried out by contractors, the enterprises decide for the externalisation of services, i.e. activities previously performed internally are transferred to independent organisations and are purchased as external services. Otherwise, if the costs of work performed internally are lower than the costs of contracted services, the internalisation of services is justified.

**Table 2.** Assumptions for the use of outsourcing and insourcing .

Outsourcing assumptions	Insourcing assumption
– lower price of external service than price paid for internal service	– higher price of external service than price paid for internal service
– minimal transaction cost	– assumption of high transaction cost
– lack of own capacities	– sufficient own capacities
– limited availability of financial resources	– availability of capital needed for equipment purchase
– inefficient use of own machines	– efficient use of own machines
– low work concentration	– high work concentration
– high levy burden	– low levy burden
– lack of proficiency in the given field	– sufficient expertise
– sufficient supply of services in the market	– insufficient supply of services in the market
– adequate legislation in the field of public procurement	– legal constrains

However, the costs savings due to the contracting do not always meet expectations. Besides traditional production costs, enterprises should take into account also transaction costs associated with the external provision of services. The amount of transaction costs can be ultimately decisive whether to outsource forestry operations or not. In some cases, transaction costs can go beyond the savings of production costs reached by contracting and finally, enterprises will pay for external service more when compared to internal service provision. Therefore, it is necessary to avoid service externalisation assuming high transaction costs, and rather, to carry out forestry operation in house. Otherwise, the lower the transaction costs are, the more convenient will be to perform forestry activities externally. The amount of transaction costs is influenced by several factors. One of them is the degree of centralisation or decentralisation of decision making processes.

High transaction costs can be expected in the case of state ownership where decisions about services are made at several levels of management. If the degree of decentralisation increased, organisational units at lower levels of management could make decisions independently, which would lead to lower transaction costs. On the contrary, centralisation of decision making rights causes limited possibilities and time intensity to obtain relevant information what results in increased costs of decision making and management as well. It is obvious that transaction costs are lower in the case of private ownership where there is an effort to simplify decision making processes.

It follows that contracting of services is more effective in case of low transaction costs and providing clearly defined property rights and ownership structure, clearly determined competencies of managing bodies and a higher degree of freedom in decision making processes. Otherwise, transaction costs are high, which is in contrary to contracting because cost savings resulting from outsourcing should not reach the level of transaction costs associated with contracted services. For this reason it is not convenient to carry out forestry activities by contractors but prefer internal performance of work.

Another factor influencing decision making about outsourcing and insourcing is the equipment of entities managing forests by necessary technology. Thus, enterprises decide whether they purchase their own machinery to carry out operations in timber harvesting in house or transfer them to external contractors. The availability of capital required

for the acquisition of new technology plays an important role in investment decisions of enterprises. The use of a loan as a source of investment financing depends on its price, i.e. on the amount of interest rate. The increasing interest rates limit the access of forest enterprises to external financial sources, due to which enterprises reduce investments in machinery and prefer outsourcing of forestry operations. On the contrary, if interest rates decrease, the availability of financial sources will increase which will have a positive impact on investment activities of forest enterprises and, consequently, they will be able to carry out forestry activities internally.

In a decision whether to internalise or externalise forestry services, it is necessary to consider the size of enterprise or the area of managed forest land and the volume of performed work. Outsourcing of forestry operations is of great importance for small enterprises. The size of forest property plays a significant role in their cases which is related to the amount of finances from wood sale. Timber sale is the most important source of income to maintain employment in forest enterprises. The low volume of work performed in timber harvesting as well as the low volume of revenue from wood sale in small enterprises does not allow them to employ their own staff permanently (which was confirmed by the respondents in several cases).

In addition, in the case of enterprises managing forests of small areas there is a problem with insufficient use of own capacities. Due to the lower concentration of harvesting operations, the performance utilisation of own machinery is inefficient. The problem also lies in the unfavourable ratio between costs and benefits, especially in the case of expensive machines. For these reasons, for small enterprises it is more effective to have forestry operations in timber harvesting performed by contractors. As regards the enterprises managing forests of large areas, the utilisation of their own machines and equipment in felling and skidding operations is more efficient due to the possibility of higher volume of concentrated work. Therefore, for large entities it is more convenient to perform forestry activities on their own in comparison with small enterprises. In the case of extensive volume of work (e.g. due to salvage felling) when the enterprises' own capacities are insufficient, the part of the operations may be performed by a supplier of forestry services.

A social factor, i.e. un/employment of own staff, has also a certain impact on decision making about forestry services. Decisions made by forestry enterprises whether to employ their own employees or rather to buy contractor services are significantly influenced by levy burden and the amount of labour costs. High levy burden and increased labour costs are the main barriers to employment which results in the reduction in the number of own employees. Due to this, enterprises transfer activities previously performed by their own staff to contractors and buy them as external services. On the contrary, reduction of levy burden allows enterprises to create new jobs and increase the number of their own staff which allows the enterprises to carry out forestry operations internally by their own employees. Other criteria of "make or buy" decisions include sufficient expertise and qualified workforce in forestry enterprises. The lack of expertise leads enterprises to carry out operations by contractors with necessary knowledge and experience in the given field. In any case,

if enterprises decide for outsourcing, it is essential to ensure that concluded contracts on forestry services will include requirements for qualified and skilled staff as well as requirements relating to quality of performed work.

Outsourcing of forestry operations is appropriate if the adequate availability of services is ensured. The supply of forestry services depends on the number and the size of business entities providing services. When the supply of forestry services exceeds the demand, forest owners need not incur higher transaction costs of finding contractor which has a positive impact on contracting. On the other hand, when demand exceeds supply of services, customers have to make a greater effort to find service providers, which leads to higher transaction costs. Insufficient supply in the forestry services market therefore results in internalisation of services.

In case of state enterprises and trading companies established by municipalities, legislative restrictions resulting from the Act on Public Procurement may negatively affect contracting due to the difficulty of public procurement process and higher transaction costs of administrative security of public procurement. One of the major risks of public procurement is supplier selection based on the lowest bid price. Contractors may purposely underestimate real costs of service provision which, in case of obtaining a contract, could result in problems to provide services in required volume, quality and time.

#### **4. Conclusion**

The change of ownership relations in Slovakia during the transformation of economy has had a fundamental effect on the formation of the market with forestry services and the development of innovations activities in business based in the forestry sector.

The intensity of the demand for forestry services depends on forestry enterprises' decision to internalise or externalise given services. The make or buy decision is influenced by a number of factors. Based on the results of questioning, several factors influencing enterprises' decision making about forestry services, were identified. These key factors include forest enterprises' machinery and technological equipment needed for performing timber harvesting activities. In most cases, current machinery and technological equipment used in the area of felling, skidding, bucking and transportation is physically old and out of date. The main reason of this state is the lack of internal financial resources and limited access to debt capital. The level of production costs seems to be the essential factor of such decision making. Not less important is the effect of transaction costs, which can exceed the savings from production costs reached by contracting. The level of transaction costs is significantly influenced by the type of ownership, or legal form of business. Besides economic criteria, social and environmental criteria or requirements have an impact on the demand for forestry services, as well. However, the effect of the social factor on forest enterprises' decision making about services is negligible. Some environmental criteria are taken into consideration when choosing contractors, but the price of the service has still a strong impact on this decision.

On the basis of the questioning results and elaborated case studies, fundamental assumptions of functioning of the forestry services market were defined. In-house provision of forestry services require, first of all, sufficient own capacities, i.e. machinery and technological equipment, skilled workforce and expert knowledge in the given field. Limited availability of capital necessary for the purchase of machinery, inefficient use of machines, high levy burden as well as the lack of proficiency in the given field lead enterprises to buying of forestry services from external contractors. Outsourcing utilisation is effective in case of lower prices paid for external services compared to costs of operations performed internally, minimal transaction costs, sufficient supply of forestry services in the market and adequate legislation in the field of public procurement.

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