

## **SOLVING THE QUESTION OF WHETHER TO OUTSOURCE OR NOT TO OUTSOURCE ROUNDWOOD TRANSPORTATION FUNCTION BASED ON THE TRANSACTION COST THEORY**

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**Keywords:** outsourcing, family business, regional entrepreneurship, transaction costs, wood procurement

**Abstract:** *In these days of leaner management stuff and tight budgets, the basic questions for both Finnish forest industry companies and in-house transportation contractors are: When do you outsource your transportation function, and when do your transportation entrepreneurs work internally? The more difficult part of the answer depends on how large your company is, the nature of your logistics/technologies, and how you operate internally. The transportation entrepreneurs felt that the most interesting form of outsourcing would be the formation of a joint venture responsible for sales and marketing of their services. Then each shareholder in the joint venture would sign their own contracts with the venture to share the work. However, entrepreneurs thought that extended-responsibility contracting (i.e., taking on internally responsibility for more duties related to transportation of wood) was only a way to transfer the customer's planning duties and wood-procurement responsibilities (as well as the associated costs) to the entrepreneurs without providing adequate compensation. If the aim is outsourcing the roundwood transportation function, decision-makers in the Finnish forest industry should modify the current working environment so that larger, more organized consortia of timber suppliers would become more profitable than they presently are.*

### **1. Introduction**

Almost all of the wood used by the Finnish forest industry is transported by trucks at some stage of the wood-procurement process, from the forest to the mill. Currently, approximately 850 Finnish timber transportation companies own about 1700 timber trucks and employ about 2600 drivers. Three-quarters of these timber transportation companies are small; families own one or two trucks, which usually deliver more than 90% of the timber to a single customer. Nowadays, three of the largest customers (Stora Enso, UPM, and Metsäliitto) dominate the wood-procurement field, with a combined market share of about 90% of the timber that is transported in Finland.

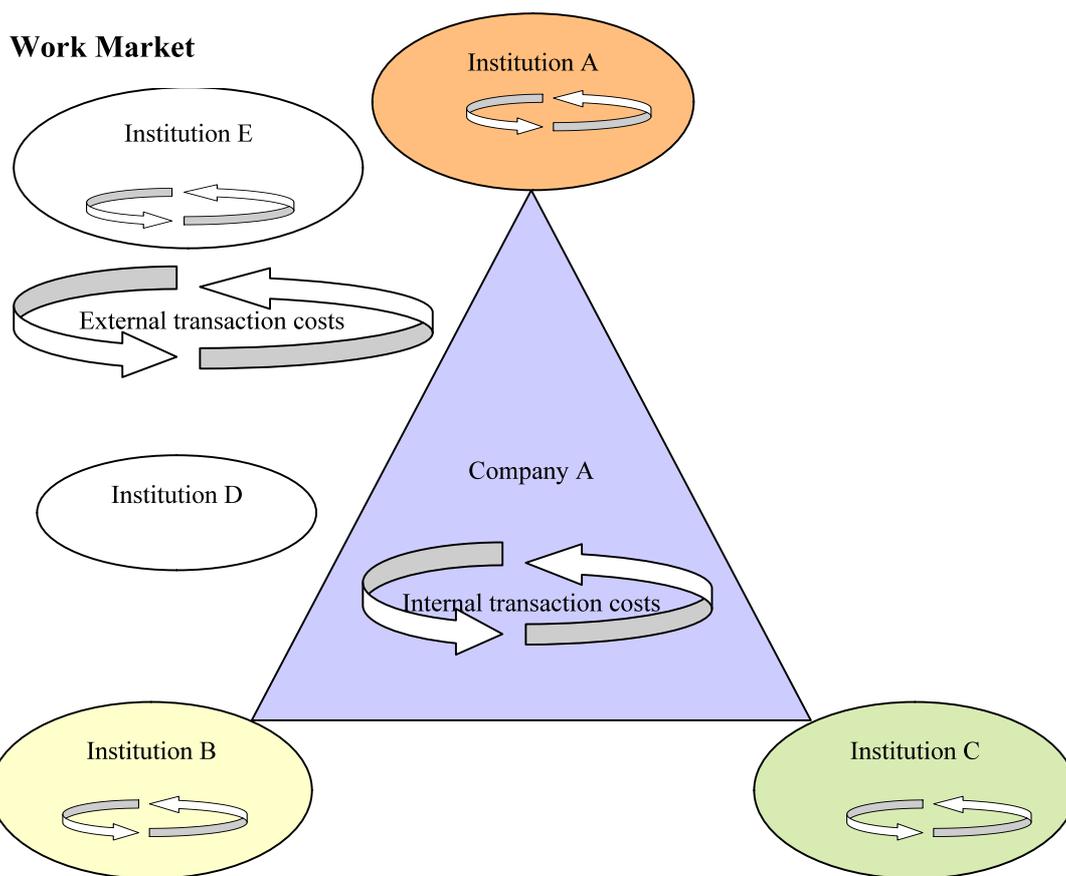
Traditionally, wood-procurement organizations sign direct transportation contracts with each transportation company. These contracts have been used to strictly define the transportation business that the entrepreneurs are responsible for. Traditionally, most of these contracts have been with employees of the wood-procurement organizations, and specified a fixed salary for the trucker. More recently, the forest industry has begun trying to outsource many of its operations, including roundwood transportation, in an effort to reduce its operating costs. However, this transition is only partially complete, and the current form of transportation entrepreneurship still retains many features of the traditional system. As a result, the kind of invoice-based (rather than salary-based) entrepreneurship that is typical of outsourced work markets has not yet become possible. In any outsourced business environment, entrepreneurs would invoice their customers for the work that they actually do, rather than receiving fixed payments (euro per ton or m<sup>3</sup>) as part of a long-term employment contract. Invoicing is also one of the most outsourced processes in the financial chain (Beimborn et al. 2005). However, the current form of co-operation in

transportation prevents the kind of invoicing. In the current operating environment, cost-efficiency is based on a large amount of the salary-based work performed by many small-scale entrepreneurs and members of their families. This environment provides relatively low direct transportation costs of wood procurement. However, it prevents the economies of scale that would become possible with larger family businesses.

Ronald Coase, the Nobel Prize winner of economics in 1992, brought the transaction cost theory to the world (or at least this transaction cost theory has been assigned to him). This theory postulates (amongst other things) that organizations exist because of market inefficiencies. Coase (1991, 1992) dedicated much of his studies to the differences between the economic systems and firms. Transaction costs link both of these. According to Coase (1992): “transaction costs become the factor upon which the productivity of the economic system depends”. Because of inefficiencies in economic markets, it is more cost-efficient to organize functions in organizations. The normal coordination role of the price mechanism is missing when the market is inefficient or non-existing. So, if there is no (external) market you can organize that specific market function within the organization and save transaction costs. This is interesting if you think about outsourcing and the transactions that are involved when dealing with outsourcing. The cost elements of the transaction involve information costs, the costs of the setting up the agreement as well as the costs of maintaining the contract.

The key to the development of a sensitivity analysis of the markets is the comparison between the additional production resulting from the rearrangement of functions and the cost of the transactions needed to bring the rearrangement about. If you can get extra production by rearranging functions, you will do so if the costs of transactions are less than the value of what is gained. Therefore it follows that if you can lower transaction costs, there'll be more rearrangements, and the economic system will become more productive. Contracts are the major means by which one firm interrelates with another firm, or one organization interrelates with the supplier or consumer. They are the neurons of the economic system (Coase, 1992). Of course, studying the contracts has to be supplemented by studies of the actions of the firms, and opinions of entrepreneurs in modifying and interpreting the terms of the contracts.

In the present study, we considered the timber suppliers to be the transportation entrepreneurs, and considered their customers to be the wood-procurement organizations in the forest industry. For the customers, there are transaction costs caused by the need to exactly specify the transportation functions. Theory of transaction models can be used to show institutions and market as a potential form of outsourcing to organize economic transactions (Figure 1) (Demsetz, 2003). In wood procurement the transaction costs are generated by the wood-procurement organization that is required to manage and control the transportation phase of the wood-procurement process. According to Williamson (1981), the determinants of transaction costs are frequency, specificity, uncertainty, limited rationality, and opportunistic behavior. These can be used when normal coordination role of the price mechanism is missing. Globalization of the forest industry has required steadily increasing efficiency and decreasing staff size in the industry's wood-procurement organizations in recent decades. At the same time, they are increasingly following standard international management philosophies that lead them to pursue the higher returns on investment achieved by other businesses. If the organizations keep growing leaner, it may become impossible to apply the traditional contracting model because the number of managers of the forest industry is too small to perform the work needed to manage and control the transportation phase.



**Figure 1.** Transaction model that shows institutions and market as a potential form of outsourcing to organize economic transactions. E.g., when the external transaction costs of the company A for the institution E are higher than the internal transaction costs, the company can grow. If the external transaction costs of the company are lower (institutions A, B, C) than the internal transaction costs, the company can be downsized by outsourcing.

In this changing operational environment, the forest industry is attempting to improve its cost-effectiveness by offering transportation contractors extended entrepreneurship agreements that increase their responsibilities (Högnäs, 2000; Palander et al., 2006). Actually, extended entrepreneurship is the first stage of ongoing process from contracting model of wood procurement chain to outsourcing model of wood supply chain. Figure 1 suggests that, after determining internal transaction costs separately in institutions and wood procurement companies, a decision can be made “whether to outsource or not to outsource roundwood transportation function” based on external transaction costs of wood procurement company. For the Finnish forest industry the extended entrepreneurship is a logical consequence of the outsourcing of business functions that is becoming increasingly common in international markets. Based on the theory of transaction costs, outsourcing could potentially reduce the total costs of procuring raw materials at the mill (Williamson, 1975; 1985). If the theory is correct, the forest industry's overall cost-effectiveness and international competitiveness would improve.

Studies suggest that outsourcing can be promoted by increasing the size of contracts, extending the number of tasks and responsibilities included in the contract, and giving entrepreneurs more freedom of action, as Högnäs (2000) proposed. In timber transportation these actions require co-operation among family businesses to form consortia, which are potentially more profitable. Palander and Väättäinen (2005) and Palander et al. (2006) noted that based on current trends, there will be fewer, larger transportation consortia in the future, with increased networking among them. The present transportation functions are also becoming differentiated and focused in different ways so that the wood-procurement process will

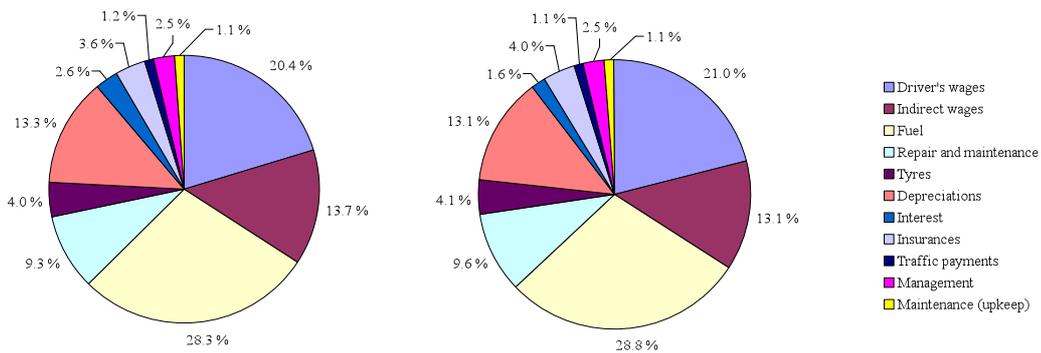
have new actors, including workers who function as coordinators between the current organizations. These contradictory results may have resulted from the fact that many of the entrepreneurs didn't understand the nature or implications of outsourcing. In the previous studies, comparisons of alternatives were therefore based more on images than on actual knowledge. This lack of knowledge may have occurred because, at that time, the industry was just beginning to obtain experience with regional entrepreneurship and had not yet clearly defined its needs.

In these days of leaner management stuff and tight budgets, the question of whether to outsource or hire in-house staff is more critical than ever in Finland. The roundwood transportation function is facing greater challenges than ever before. Forest industry companies that already employ in-house transportation contractors are looking at doing more with fewer resources. Start-ups, both customers and suppliers with no internal transportation staff, are struggling with how to develop transportation function in the most cost-effective way. For both start-up and mature companies, the basic questions are: When do you outsource your transportation function, and when does your transportation staff work internally? By examining a typical strategic situation, costs will be analyzed and questions about when turn to staff which functions internally will be answered. This article also examines either entrusting all or part of the transportation function to outside suppliers. There are no quick answers to these questions, because there are several factors to consider. The more difficult part of the answer depends on how large your company is, the nature of your logistics/technologies, and how you operate internally. Drawing on my 35 years of experience in managing the transportation function, this article provides a framework for analysis and decision-making in respect to outsourcing and/or staffing the transportation function vital to wood procurement process.

Our review of the research results, opinions, and theories related to outsourcing and regional entrepreneurship suggests that both should be based on co-operation, but co-operation between actors requires improvement. Bengtsson and Kock (2000) noted that competition and co-operation can exist simultaneously within a network of companies. It has been assumed that regional entrepreneurship will remain uncommon because it is not clear how to encourage co-operation between wood suppliers and between suppliers and their customers in the current changing operating environment. Therefore, the specific objectives of the present study were to investigate how to increase co-operation in the timber transportation business and facilitate the ongoing outsourcing of wood-procurement responsibilities in the Finnish forest industry. To support this research, we surveyed entrepreneurs to learn their opinions about the following categories of questions: (1) How prepared are entrepreneurs to develop co-operative agreements, and what possibilities do they see arising from these agreements? (2) Are entrepreneurs willing to form various kinds of consortium, and what are the perceived implications for their profitability? We also focused on the questions of supplier-customer relationships and family business size, since these are possible explanatory factors for the different opinions of respondents.

## **2. Material and methods**

The data used in this study was obtained from Finland in 2005 and 2010. The previous data was collected using a questionnaire that was carefully tested and revised before using it to collect the research data. The survey was distributed by mail to wood transportation entrepreneurs belonging to the Finnish Transport and Logistics Association (SKAL). This association represents transportation entrepreneurs in negotiations with customers in work markets. About 410 timber transportation companies are members of the association in study area. Another data was collected 2010 which is depicted in the figure 2. The costs of a timber haulage company increased 20 % from year 2005, and are shown in the financial statements as four main cost sources: purchases (for example parts, maintenance, fuel) wages (for example wages, pension contributions, indirect employee costs), other fixed costs (for example upkeep, rent, insurances), and capital costs (for example interest, depreciation). As expected the highest costs per cents in the roundwood transportation sector consist of wages and fuel. The cost share of them increased 0.5. If the management costs are considered as an indicator of outsourcing, it seems that anything has not happened since 2005 which could be interpreted as increase of outsourcing.



**Figure 2.** Change of timber haulage truck's cost index from 2005 (left) to 2010 (right) according to K. Palojarvi (personal communication June 15, 2010).

Outsourcing was considered between the forest industry and entrepreneurs, because external services of the entrepreneurs do not cause transaction costs as such because they are mainly sub-contracts. Transportation outsourcers play a kind of coordinator –role and their management costs was considered as the transaction costs. We divided our questionnaire into three parts. The first part asked entrepreneurs about their current situation and obtained other background information, such as the form of the company, the form of their contract, the size of their business, and their most important customer. We used the last two parameters as the basis for grouping the family businesses. All respondents answered the same questions so that we could compare the answers between groups. We used the number of timber trucks as an indicator of the size of a respondent's business; we divided the entrepreneurs into three groups based on the size of their family business. Of the 76 respondents, 44 had only one truck ("small family business"). Medium family business (16 respondents) had two trucks, and large family business (16 respondents) had three or more trucks. The biggest family business had 12 trucks.

We did not find statistically significant differences in the number of years of experience between entrepreneurs with different family businesses sizes. However, owners of the large family businesses had, on average, been working as transportation entrepreneurs for a little longer (30 years) than entrepreneurs who owned medium (23 years) or small (23 years) family businesses. The number of working hours per week can vary greatly for entrepreneurs depending on the season, annual holidays, sick leave, and time required to their repair equipment. Our survey was distributed in mid-winter and late winter, but the duration of the work week was similar in both cases (an average of 68 hours per week). We found no statistically significant differences in working time between family businesses of different sizes or with different customers.

In the second part of the questionnaire, we asked entrepreneurs about their attitudes towards the concept of regional entrepreneurship. To do so, we asked entrepreneurs to state their opinions about various statements using a seven-step Likert scale, ranging from "I fully agree" to "I fully disagree". The third part of the questionnaire investigated co-operation between transportation family businesses by asking them to evaluate a series of statements concerning different forms of consortium, and particularly about whether they perceived these forms of consortia as interesting and likely to be feasible. This part of the survey employed "strategic gap analysis" (Ansoff, 1965), and contained statements that were designed to evaluate the preparedness of entrepreneurs to choose different forms of consortium, and opportunities to do so. We also asked the entrepreneurs to estimate the truthfulness of each statement. For many of the questions, we also gave entrepreneurs an opportunity to explain their responses, and some of these responses provide possible explanations for the results.

We analyzed the data using SPSS-X (IPM SPSS, Cary, NC, USA) in three stages. In the first stage, we summarized the background information using averages for the volume of activity and percentage shares of the response rates. The attitude results based on the seven-point Likert scale were analyzed based on the relative shares of answers based on a weighted average of the responses. In the second stage, we

analyzed the answers using Kendall's rank-correlation coefficient ( $\tau$ ). In the third stage, we studied groups of family businesses using nonparametric analysis of variance (the Kruskal-Wallis test) and compared these groups two at a time using the Mann-Whitney  $U$ -test. We used these tests because they let us test whether two independent samples (groups) came from the same population. The former test revealed whether the groups being tested were significantly different, after which we identified specific significant differences using the Mann-Whitney  $U$ -test in paired comparisons. Unless otherwise noted, we used a significance level of  $p < 0.05$  for all results.

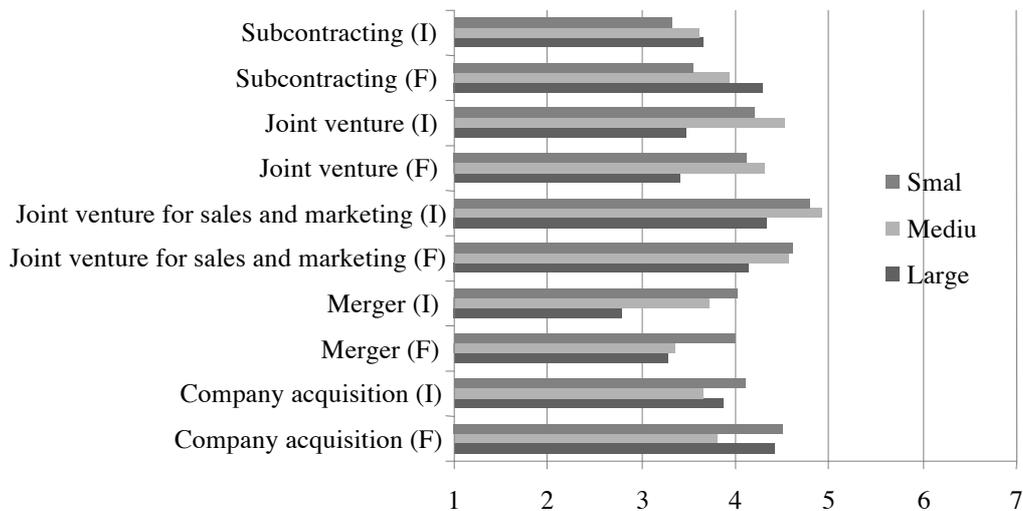
### 3. Results

We investigated the interest of entrepreneurs in various potential forms of co-operation and the perceived feasibility of that form, with the results pooled for all respondents (Table 1). Then we repeated this analysis for the entrepreneurs grouped based on family business size (Figure 3).

**Table 1.** Entrepreneurs' interest in and perceived feasibility of various forms of co-operation. 1 = Fully disagree, 2 = Disagree, 3 = Mildly disagree, 4 = Don't know, 5 = Mildly agree, 6 = Agree, 7 = Fully agree.

Form of co-operation	Mean Likert value	
	Interest	Feasibility
Sub-contracting	3.5	3.8
Joint venture	4.1	4.0
Joint venture for sales and marketing	4.7	4.5
Merger	3.7	3.7
Company acquisition	4.0	4.3

All family business sizes ranked a joint venture for sales and marketing as the most interesting alternative. Small family businesses also considered this option to be the most feasible, but large family businesses ranked it in third place in terms of feasibility, with subcontracting and company acquisition ranked higher. Medium family businesses thought that joint venture and joint venture for sales and marketing were the most feasible alternatives. Small family businesses were more interested in a merger (mean Likert value = 4.0) than large family businesses (2.8), and the difference was significant.



**Figure 3.** Attitudes of entrepreneurs with companies of different sizes towards various forms of consortium. 1 = Not at all interesting/feasible, 2 = Not interesting/feasible, 3 = Not very interesting/feasible, 4 = Don't know, 5 = Quite interesting/feasible, 6 = Interesting/feasible, 7 = Very interesting/feasible.

Table 2 summarizes the underlying factors responsible for the selection of the alternatives for each group of customers. The entrepreneurs working for Stora Enso were significantly less interested (mean Likert value = 2.6) in expanding their family business than the entrepreneurs working for UPM (3.9). The entrepreneurs working for Metsäliitto (5.0) believed that they had enough monetary resources to expand their activities significantly more than entrepreneurs working for "Other customers" (3.3). Entrepreneurs working for "Other customers" believed that expanding their family business would require hiring of additional staff for supervision and planning duties (5.9) significantly more than those who worked for the Finnish Forest and Park Service (4.8).

**Table 2.** Levels of agreement with statements that explained the choice of a form of consortium. 1 = Fully disagree, 2 = Disagree, 3 = Mildly disagree, 4 = Don't know, 5 = Mildly agree, 6 = Agree, 7 = Fully agree. Entrepreneurs were divided into groups based on their family business size (Small (1 truck) = S, Medium (2 trucks) = M, Large (3 or more trucks) = L) and their most important customer (Stora-Enso = A, UPM = B, Metsäliitto = C, Forest and Park Service = D, Other Customers = E).

	Customer					Family business size		
	A	B	C	D	E	S	M	L
I have considered selling my family business to someone who is expanding their activities	3.3	3.8	4.2	2.9	3.6	3.4	4.6	2.8
I am willing to expand my family business	2.6	3.9	3.0	2.9	2.7	2.9	2.9	3.7
I have enough monetary resources to expand my activities (savings or ability to obtain a loan)	4.5	4.3	5.0	5.0	3.3	4.4	3.8	4.8
There will be a shortage of drivers in the future	6.0	6.5	6.4	6.5	6.3	6.2	6.3	6.1
I am interested in co-operation with harvesting entrepreneurs	4.6	3.8	5.0	4.3	4.1	4.0	3.9	4.6
An increase in the size of the family business will also increase its profitability	2.8	2.4	3.2	2.1	2.6	2.5	2.3	3.3
Expanding my family business will require the hiring of additional staff for supervision and planning duties	5.5	5.1	4.8	4.8	5.9	5.1	5.9	5.1
Improving efficiency will let me hire additional staff	4.0	3.8	4.3	3.4	4.3	3.8	4.2	4.1

Better routing and backhaul planning will save money 5.1 4.9 5.1 4.6 4.7 4.4 5.3 5.4

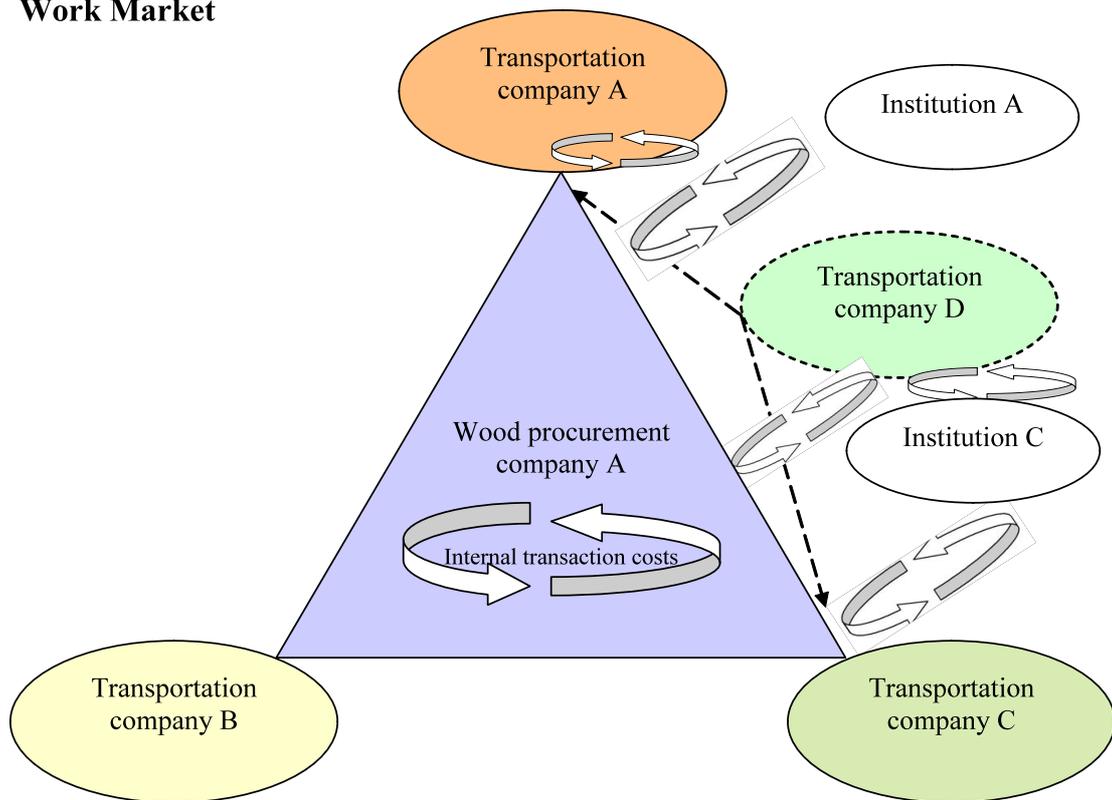
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Table 2 also summarizes the responses to the same questions, but grouped by family business size. Almost all respondents thought (mean Likert value = 6.2) that there will be a shortage of drivers in the near future. Some entrepreneurs noted that this was already a problem that limited expansion of their family business. Respondents were most negative about their willingness to expand their family business (3.1) and about whether increasing the family business' size would increase their profitability (2.6). The small and medium family businesses (2.5 and 2.3, respectively) rated this probability lower than the large family businesses (3.3), and the difference was significant between the large and medium family businesses. The willingness to expand received a mean ranking of 2.9 for the small and medium family businesses, versus 3.7 for the big family businesses. The entrepreneurs were neutral about whether they were interested in co-operation with harvesting entrepreneurs (4.0, 3.9 and 4.6 for small, medium and large family businesses, respectively). However, some entrepreneurs in each size group were very interested in this option. Respondents with medium family businesses believed that expanding their family business would require hiring additional staff for monitoring and planning duties more (5.9) than those with small or large family businesses (5.1), and the difference was statistically significant between the small and medium family businesses. Those with small and medium family businesses were less positive that better routing and backhaul planning would reduce their costs (4.4 and 5.3, respectively) than entrepreneurs with large family businesses (5.5), and the difference between the small and large family businesses was significant. The entrepreneurs with medium family businesses had thought about selling their family business more often (4.6) than the other entrepreneurs (3.4 for small family businesses and 2.8 for large family businesses), and the difference between the medium and large family businesses was significant.

#### 4. Discussion

Concerning the objective on investigate how to develop co-operation in the family business and to facilitate the outsourcing in forest industry the important aims were to learn what factors are preventing regional entrepreneurship from becoming more common. One important obstacle was a lack of information about the plans of the entrepreneur's most important customer with respect to regional entrepreneurship. The entrepreneurs who worked for Stora Enso believed that their customer had kept them poorly informed about the company's plans, and that the customer's attitude towards regional entrepreneurship was unclear. Costs of information systems should be added to transaction costs before outsourcing decision (Coase, 1991). In this context, it is important to remember that regional entrepreneurship is a form of the extended entrepreneurship (i.e., increased transportation responsibilities) that is often part of a company's outsourcing strategy. Despite the bad reputation of outsourcing, general attitudes towards this business strategy can still be positive if entrepreneurs understand the situation and are confident their customers will support them through the transition to this business model (Figure 4). According to the transaction costs theory (Williamson, 1975; 1985), it would be possible to reduce costs by outsourcing the roundwood transportation function. In practice, this has been the companies' goal, and in the years soon after our study, e.g., Stora Enso changed their corporate policy to be more favorable towards regional entrepreneurship, although they referred to this approach under a different name. The same approach can be recommend to new wood-procurement organizations, because co-operation (specifically, improved communication of the customer's goals and the entrepreneur's responsibilities) between suppliers and their customers can be increased by organizing transportation around models, such as regional entrepreneurship, that are more cost-efficient than the models that are currently used (Palander et al., 2006).

## Work Market



**Figure 4.** Transaction model that shows transportation companies as a potential form of outsourcing to organize economic transactions. E.g., when the external transaction costs of the wood procurement company A are lower than the internal transaction costs, the company can be downsized by outsourcing for the transportation company D.

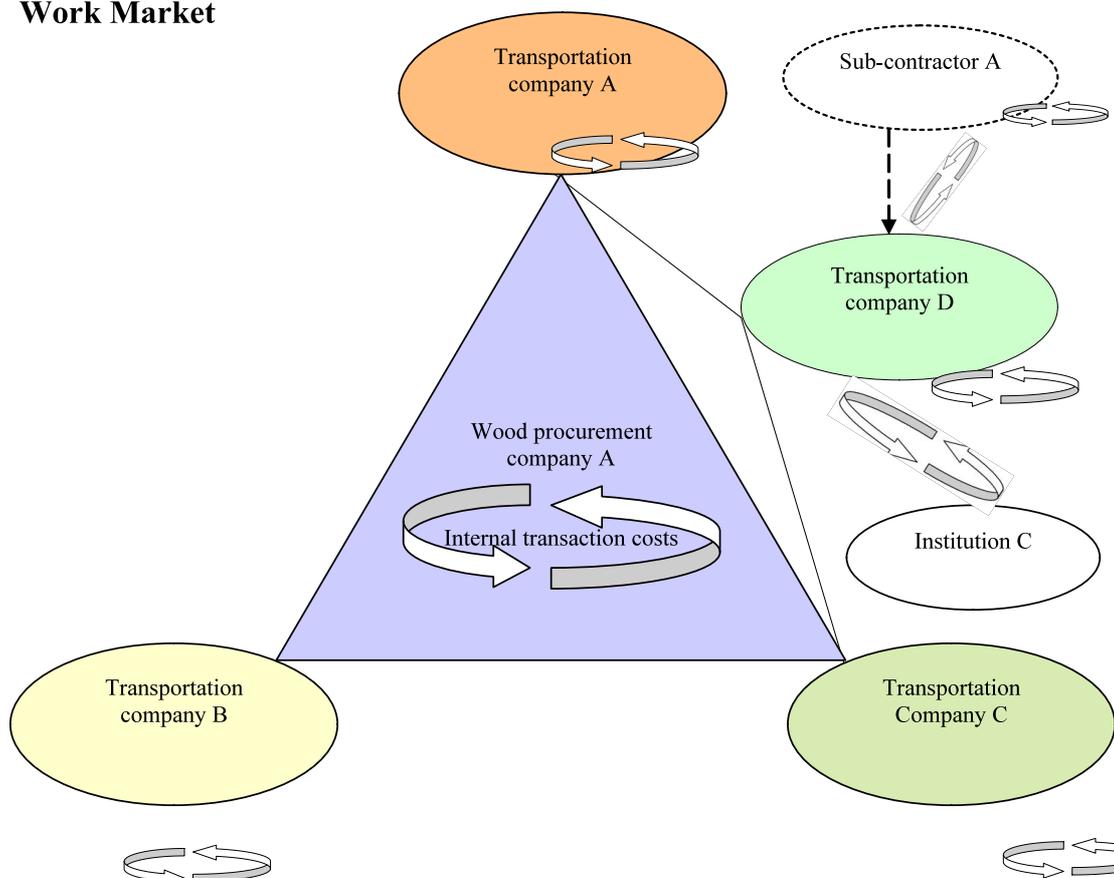
Transportation entrepreneurs had similar views about many statements regarding regional entrepreneurship. Most perceived that regional entrepreneurship was only a way to transfer the customer's planning duties, management responsibilities, and costs to entrepreneurs without providing adequate compensation. This view is a major, previously unremarked obstacle to the development of regional entrepreneurship because even entrepreneurs whose customers were promoting regional entrepreneurship believed that the goal was to shift these burdens to the entrepreneur. It also seems that wood-procurement organizations that have begun applying regional entrepreneurship are working similarly to how they worked before adopting this approach; for example, they still define how entrepreneurs should manage their operations instead of leaving the choice to the entrepreneur. Most entrepreneurs who responded to our survey wanted to manage their routing and inventory control planning as well as negotiating pay rates from a position of more power by forming a bigger consortium. Although materials-related functions related to the flow of roundwood have been developed by forest industry, our results suggest that the flows of money and information must be developed further because of their importance to an entrepreneur's business operations. According to Beimborn et al. (2005) the financial chain is rarely designed and optimized to provide a competitive advantage on its own because it is usually a secondary process to support a customer's core business.

On the other hand, regional entrepreneurship was not expected to improve the bargaining position of timber suppliers. In the current economic situation, with increasing global competition, this form of entrepreneurship was seen as a possible way to survive, although the entrepreneurs were generally more interested in the pay-rate policies of their customers than in regional entrepreneurship. Almost all entrepreneurs mentioned an imbalance between pay rates and transportation costs as a serious obstacle to the development of regional entrepreneurship. In addition, many respondents described their current economic situation as unsustainable. This is quite understandable given that our study was conducted in

2005, when the profitability of the Finnish forestry sector was poor because of rapidly rising fuel prices and a strike that affected many paper mills. In addition, the current recession and a delay in the education of truck drivers have also reduced profits.

Another obstacle to the development of regional entrepreneurship involves the difficulty of co-operation between entrepreneurs. Our results suggest that it will be necessary to develop an operational environment in which business networks are in place that let entrepreneurs simultaneously compete and cooperate, as Bengtsson and Kock (2000) have suggested (Figure 5). These aspects of co-operation have been important targets of research, where models have been developed to meet the management needs imposed by the networking of the outsourced business (Bengtsson and Kock, 2000; Bititci et al., 2005). However, this approach remains unknown in the family business of roundwood transportation sector although customers are operating successfully.

### Work Market



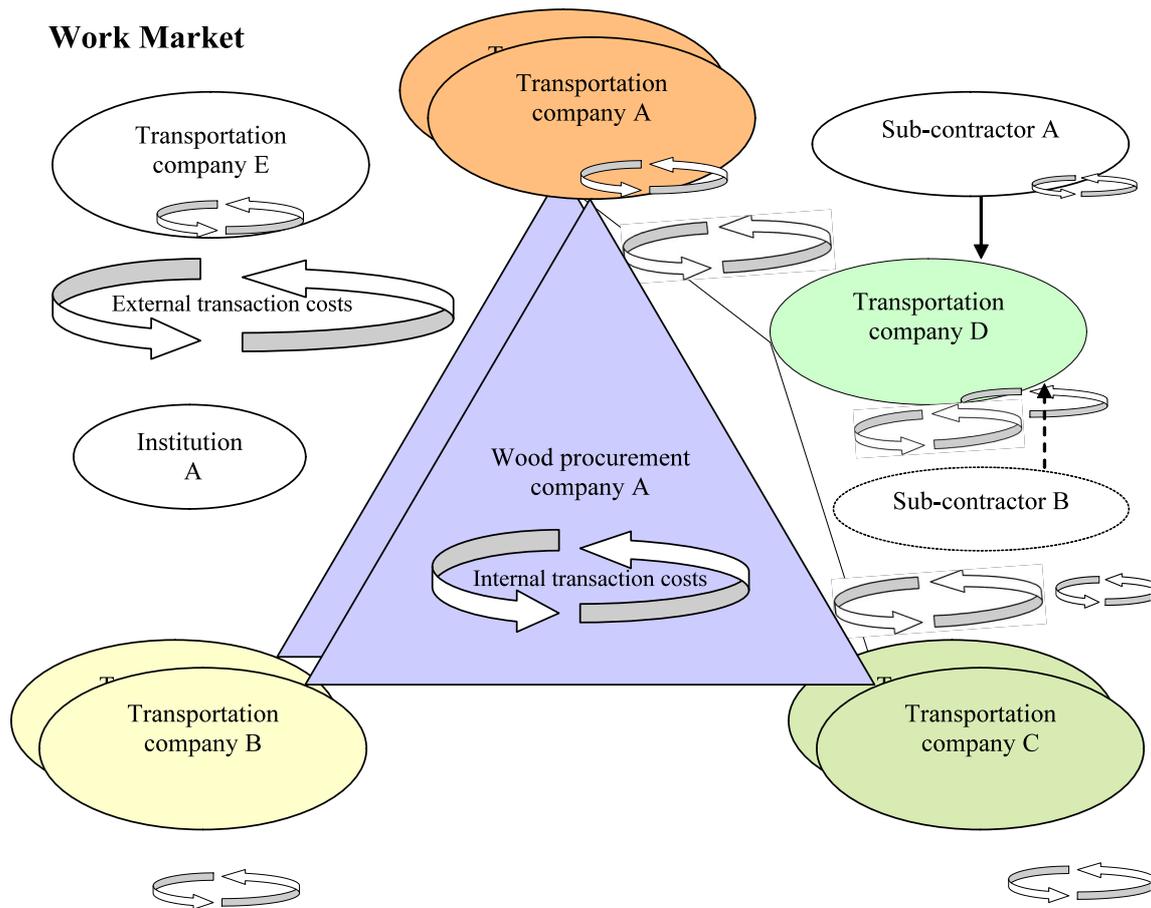
**Figure 5.** Transaction model that shows sub-contractors as a potential form of outsourcing to organize economic transactions. E.g., when the external transaction costs of the transportation company D are higher than the internal transaction costs, the company can grow. If the internal transaction costs of the transportation company D are higher than the external transaction costs for the sub-contractor A, the transportation company can be downsized by outsourcing.

We found that entrepreneurs with four or five trucks were most content with their situation, and this group regarded regional entrepreneurship more positively than any other group. Although differences between this family business group and other large family businesses weren't statistically significant, this group believed more in their skills and opportunities. Entrepreneurs who owned four or five trucks also believed more often than any other group that growth of their family business would increase profitability, but at the same time, they were more reluctant than entrepreneurs of other large family businesses to expand their business. These results appear to be contradictory, but the results can be explained by the results of Soirinsuo and Mäkinen (2009), who calculated that the most profitable

company size in Finland was five or six trucks, after which the growth of the company did not seem to improve profitability. It is possible that entrepreneurs with four or five trucks saw that growth had been profitable up to their current family business size, but feared that future growth would require investments that were bigger than the expected revenues. They would rearrange production functions if the costs of transactions are less than the value of what is gained, as Coase (1992) has suggested. Therefore it follows that if entrepreneurs can lower transaction costs, there'll be more rearrangements, and the economic system will become more productive.

Transaction cost theory is further supported by conclusions made by Soirinsuo and Mäkinen (2009). According to them, the growth strategy between the size groups of family businesses is clearly different. The bigger the companies turn over, the more they relied on outsourcing. Companies over 2.5 mill euro increased their purchases of subcontracts drastically to almost one fifth of their turnover in 2006. This is also a good example of the entrepreneurial actions taken in order to try to develop company's business model and profitability. However, companies under 1.5 mill euro turn over worked almost without any subcontracting. Outsourcing partly explains the differences in purchases and other fixed costs: companies did not need to buy fuel, when services were bought from another company. It is possible that the larger companies' taking on of so many contracts compared to the sector average meant that organizing them required considerably more work and resources. Therefore we can not see increase in average costs from year 2005 to 2010 in Figure 2. Problems with the transaction cost analysis arise because there are no clear or universally accepted guidelines (e.g. Activity Based Costing or Dynamic Activity Based Costing) regarding the determination of certain costs and their sources. This is typical problem in small family business. Entrepreneurs might place the same costs under a different cost source. Therefore this study discusses on bigger cost aggregates, which clearly makes for better reliability.

Family businesses with two trucks seemed to be a problematic size. These entrepreneurs were least interested in expanding their business and were least likely to believe that growth of the family business would improve their profitability. These entrepreneurs believed most commonly that the forest industry was only promoting regional entrepreneurship as a way to transfer wood-procurement costs to the transportation entrepreneurs and that it would become necessary to hire additional staff for management of their operations. Owners of these family businesses had also more often considered selling their family business than other entrepreneurs, and they had more doubts about their abilities and whether their resources were sufficient to permit growth. It seems that two trucks are insufficient to provide economies of scale, and that to grow, these entrepreneurs would have had to change their working methods by hiring additional staff. However, this change increases internal transaction costs of the transportation family business, which may prevent outsourcing in Finnish forest industry (Figure 6), because it may also increase external transaction costs of wood procurement company. For these family businesses, it appears to be more difficult to achieve good profitability simply by increasing the workload of the entrepreneur, as can be done in one-truck family businesses. This became evident from the total volume of roundwood carried by the family businesses, because the productivity ( $m^3/h$ ) per vehicle of two-truck family businesses seemed to be lower than that of one-truck family businesses.



**Figure 6.** Transaction model that shows wood procurement, transportation companies and market as a potential form of outsourcing to organize economic transactions.

We also wanted to learn how interested entrepreneurs would be in forming various kinds of consortia and their perceptions of how feasible these alternatives would be. The alternatives that we proposed weren't especially interesting or perceived as easily feasible to the entrepreneurs, though opinions varied. The best alternative appeared to be a joint venture for sales and marketing of services. This joint venture would sign contracts with customers, and then each shareholder would sign their own contract with the joint venture. All monetary transactions would be based on invoicing for services rather than on salaries. This was the only alternative that wasn't opposed by any group of family businesses. The result indicated that invoicing encapsulated in the financial chain should be addressed in outsourcing as an autonomous source of competitive advantage, as Beimborn et al. (2005) have suggested. There was also a statistically significant correlation between interest towards mergers and interest towards company acquisitions. On the other hand, there was a significant correlation between the interest in and perceived feasibility of the various consortium alternatives. This is obvious, because when entrepreneurs were interested in some form of consortium, they also saw it as a feasible alternative or at least as more feasible than other alternatives in the current working environment. It is good to note that this survey established the current performance status ("gap") being provided based on the operational-level entrepreneurs' opinions. In future, this strategic analysis could be continued using the collected benchmarks of SKAL or the industry's best practice leaders as the wood procurement organization desired target performance.

One reason for the lack of interest in forming consortia was the long work week. On average, an entrepreneur worked almost 70 hours per week, and in some cases, more than 100 hours. Clearly, the work week is too long for the well-being of entrepreneurs, and this may explain why most entrepreneurs weren't interested in expanding their family business: they feared the possibility of further increases in their work week. On the other hand, subcontracting wasn't an interesting alternative either for the small and medium family businesses, so it is understandable that selling the company was a more interesting

alternative for these entrepreneurs. In the future, more research will be needed to develop an operational environment in which increasing family business size is an attractive option.

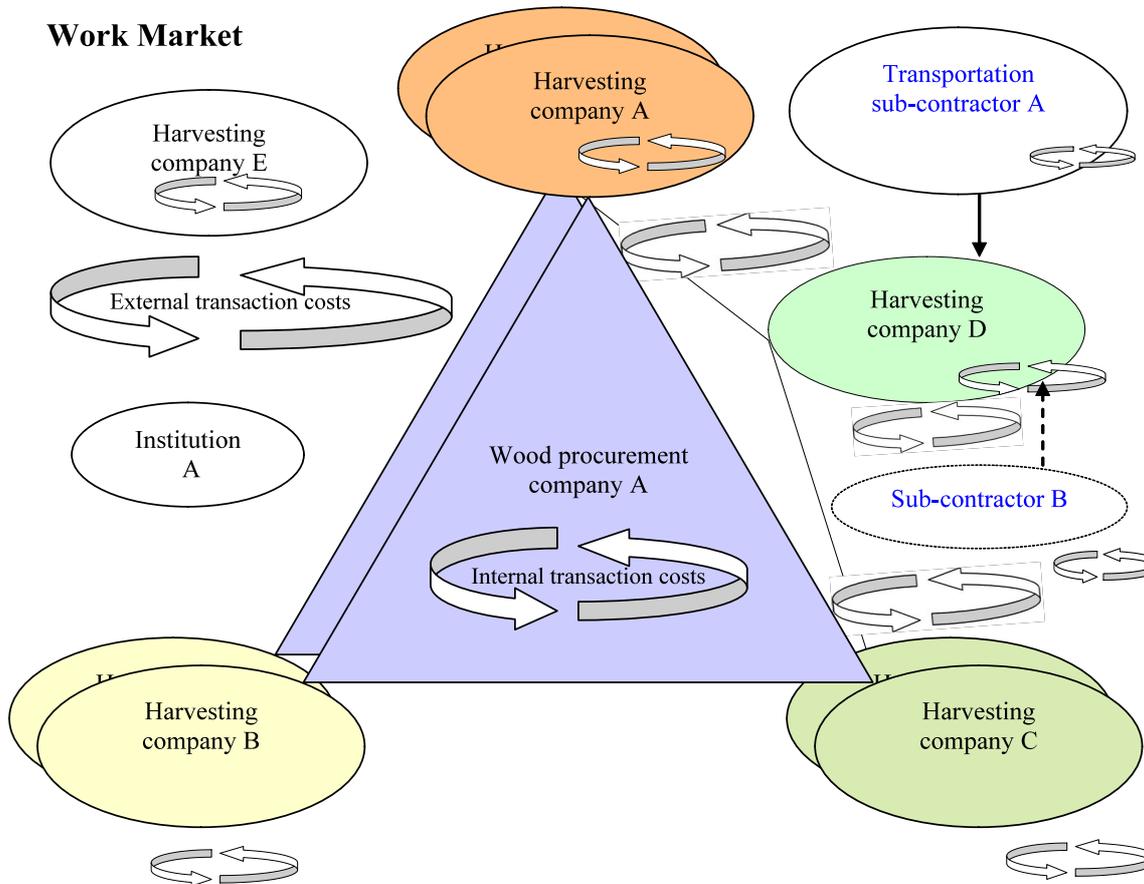
Opinions about co-operation reflected the views of entrepreneurs who had not yet adopted regional entrepreneurship. These workers are the group with the most potential for the development of improved co-operation between roundwood suppliers and their customers. These workers are described as transportation company or sub-contractor (circle with dashed border line) in the transaction model (Figure 4, 5 and 6). The results indicated that only the first steps have been taken towards outsourcing, because practical details about the forms of consortia are still unclear. This was also revealed by comparing the present results with those of theoretical studies of co-operation and its objectives by Högnäs (2000). Because transportation entrepreneurs understood co-operation differently, it will be necessary to propose consistent developmental decisions to ensure the groups of entrepreneurs have the same understanding.

A joint venture that focuses on sales and marketing could be a way to promote the development of outsourcing by awarding larger contracts than are currently awarded, larger business functions thereby giving entrepreneurs more business and an incentive to increase their operational capacity and giving entrepreneurs more freedom of action. Before drawing further conclusions about this possibility, more studies will be necessary to confirm, for example, whether this form of organization can be developed and understood by entrepreneurs, and how the coordinator of such an organization would manage the flows of materials, money, and information required to support transactions of the transportation function.

## **5 Conclusions**

The results of the present study suggest that external reorganization of the truck transportation sector and internal structural changes in family businesses are currently underway, but that the objectives of these changes are unclear for all stakeholders in the wood-procurement sector. To facilitate the development of co-operation in the roundwood transportation business, transaction costs and the objectives of co-operation should be determined quickly and communicated to all stakeholders. The challenge for family business executives is to find the best set of interconnected service solutions that meet the strategic needs of wood procurement organization. Those who are considering outsourcing of the wood-procurement function must be aware of the linkage between reducing the staff in wood-procurement organizations and reorganizing the roundwood transportation sector, and the effect of the resulting operating environment on opportunities for co-operation. For better environment the entrepreneurs felt that the most interesting form of consortium between suppliers, which would let them respond better to outsourcing, would be the formation of a joint venture responsible for sales and marketing of their services. Such a company would develop an overall contract with each customer, then each shareholder in the joint venture would sign their own contracts with the venture to share the work. All transactions would be based on invoicing instead of the current salary-based approach. However, entrepreneurs did not believe that their profitability would increase by expanding their family business in the current economic environment. To conclude, if the aim of co-operation is to outsource the roundwood transportation function, decision-makers in the Finnish forest industry should modify the current environment so that larger, more organized consortia of timber suppliers would become more profitable than they presently are. Timber suppliers' role could even be given to harvesting entrepreneurs whom are responsible for large areas of

wood procurement. Transportation entrepreneurs could operate as sub-contractors as Figure 7 shows.



**Figure 7.** Transaction model that shows harvesting company as an actor of wood-procurement outsourcing.

### Acknowledgment

Authors are grateful to “Metsämiesten Säätiö” for funding. We also thank all the entrepreneurs who participated in our study, and Kari Palojarvi, Director of the Timber Carriers Association, for making this study possible.

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