

Consequences of Industrial Contexts for Procurement and Management of Logging Services: A Comparison between Two Swedish Forest Companies

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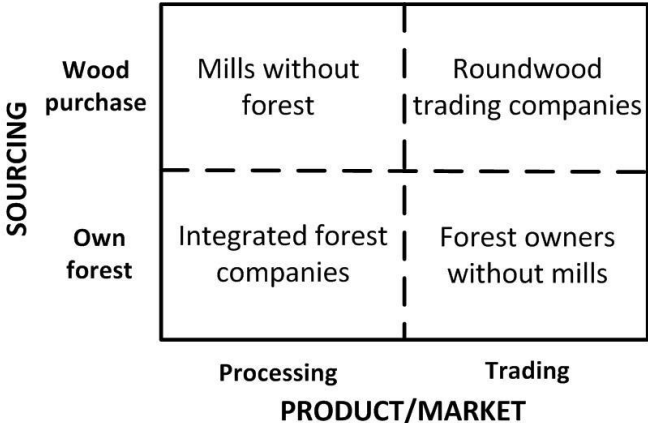
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Introduction

The Swedish forest industry must constantly increase productivity in order to stay competitive on the international market. One way of meeting these demands has been through outsourcing of logging services. During recent years however, productivity development has stagnated, and a decline is even indicated. This comes at the same time as higher demands to quality; both with respect to products and delivery fulfillment, all well as environmental and social demands. The challenge of increasing complexity reveals a need for improved management practices among forest companies. However, different companies operate in different situations with respect to their business strategies (product and market), as well as supply strategies (sourcing). In general, companies either process their roundwood in own mills and sell refined products on the international market, or they trade roundwood on the national market. In both cases, sourcing is from own forests or from other industrial or non-industrial private forest owners. Wood from private forest owners is purchased primarily by contracting sites that are to be harvested by the purchasing companies. How much of the supply structure that consists of own forests vs. such purchases varies among companies. Given these general differences, four combinations of business and supply strategies can be characterized as illustrated in Figure 1.

Figure 1. A classification of different company contexts depending on sourcing and product/market among Swedish forest companies.



The varying company situations are associated with varying degrees of *uncertainty* in supply and demand. A roundwood trading company (located in the upper right corner of Figure 1) handles both uncertainty in the market for wood sourcing, as well as uncertainty in future customer demand. In contrast, an integrated company (lower left corner) has lower uncertainty in roundwood supply, because it sources from own forests and has better insight into its own mills' future production plans. For the companies, the different situations form the background to varying operating environments, commonly referred to as *industrial contexts*.

This study aimed to identify and describe the consequences of industrial contexts for procurement and management of logging services. Business activities were mapped and

compared at two case companies that had fully outsourced their harvesting services. Both companies sourced their roundwood from private forest owners, but they were *contextually different in respect to their supply responsibilities*. One company did not own mills, and only traded roundwood, thus having an *external* supply responsibility. The other company had its own sawmills, but no pulp mills, giving a primarily *internal* supply responsibility.

Materials and Methods

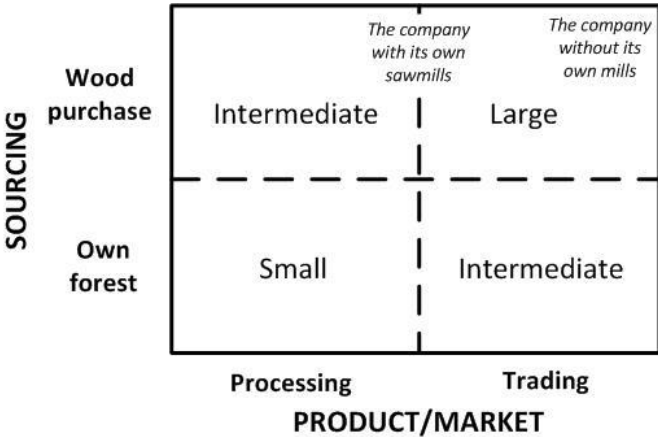
Using interviews, process mapping was done in two separate steps. First, a context mapping was done of the two case companies’ main business activities. By comparing the process maps, differences between the company contexts could be pin-pointed. Secondly, a detailed mapping was done of the logging activities at each company where the consequences of the contextual differences on logging activities could be analyzed.

Results and Discussion

The two companies’ business tasks were fundamentally different. The business task for the company with its own sawmills was to supply the mills’ current needs with a high degree of precision. This required frequent adjustments of logging production in the short-term (<6 months) to meet frequent short-term variation in mill demand. The long-term uncertainty, however, was lower because of good visibility of the own sawmills’ future demand (>6 months). In contrast, at the company without own mills, the task was to sell roundwood at a profit. Roundwood was produced according to fixed six-month delivery contracts with external mills. This resulted in few short-term adjustments in logging production (within the contract period), but higher long-term uncertainty (between periods) due to low visibility of future demand.

Uncertainty in demand and supply leads to a corresponding need for flexibility in logging capacity. The lower long-term (>6 months) demand uncertainty at the company with its own sawmills requires a slightly smaller flexibility need between six-month periods compared to the company without its own mills. In contrast, a fully integrated company could be assumed to have an even smaller flexibility need due to lower uncertainty in both supply and demand. A characterization of flexibility needs depending on company situation is illustrated in Figure 2.

Figure 2. A characterization of long-term (>6 months) flexibility needs in logging capacity, depending on varying contexts (sourcing and product/market) among Swedish forest companies. Here, the two case companies are positioned.



The varying needs for capacity flexibility (within and between six-month periods) described above had to be met in procurement of logging services. All interviewed managers at both case companies preferred to meet their flexibility needs by a corresponding proportion of their capacity need contracted for limited time periods (of certain demand). However, many

managers perceived a shortage of contractors that were qualified to fulfill all service requirements. Therefore, in order to secure qualified capacity, these managers chose to fill a large proportion (>90%) of their estimated capacity needs with long-term contracts (indefinite in length, but with a mutual six-month termination period) and to instead gain flexibility through the use of mid-sized machinery that could alternate between clear-cutting and thinning. To some extent this approach could be used to adjust the overall capacity level, but using mid-sized machinery in clear-cuttings was perceived to increase costs per harvested unit compared to large (clear-cutting specific) machinery.

The company without its own mills generally negotiated contract renewals with external mills on a six-month basis. The agreed prices for mill deliveries were reflected in fixed price levels per period and assortment for the sites purchased from forest owners. This meant that the profit margin between mill sales and site purchase had to be secured within a limited time period. Consequently, this constrained the scheduling of logging sites, because priority had to be given to harvest sites with secured (period-specific) profit margins. To some extent, this reduced the possibility to schedule the most efficient routes between sites for contractors (few/short relocations).

Between districts, production managers had a varying number of mill quotas to handle. Here, the term quota refers to the specific volume of an assortment promised to a specific receiving mill, to be delivered within the time period (commonly one month). Considerable differences could arise between estimated and actual production per assortment at purchased sites and the higher the number of mill quotas to be handled, the higher the sensitivity of production management to these differences. A high number of quotas increased, therefore, the needs for short-term re-planning of logging schedules. This also shortened the time horizons for managers to give definite logging schedules and site instructions to contractors. Short time horizons were considered a problem by many contractors, because it reduced their possibilities to do preparatory planning.

Conclusions

Based on the presented results, some conclusions can be made regarding procurement and management of logging services:

- Uncertainty of supply and demand gives corresponding flexibility needs for capacity flexibility.
- In this study, managers would have preferred to meet flexibility needs by a corresponding proportion of short-term service contracts.
- A shortage of qualified contractors resulted in a higher proportion of long-term service contracts where flexibility could be potentially gained through the choice of mid-sized machinery (less operation-specific).
- An increasing number of mill quotas presents a risk for decreasing production managers' time horizons for delivering logging schedules and site instructions to contractors. This decreases contractors' possibilities to do preparatory planning and poses a risk for further reducing contractor efficiency.