

**LAPPEENRANTA UNIVERSITY OF TECHNOLOGY**  
**School of Business**  
**Accounting**

**THE BOUNDARIES OF A FIRM IN THE PULP AND PAPER INDUSTRY:  
COMPLEMENTARITIES OF THE RESOURCE-BASED VIEW AND  
TRANSACTION COST ECONOMICS**

**Examiners: Professor Jaana Sandström**  
**Professor Ari Jantunen**

**Lappeenranta, 2 May 2007**

**Ville Anttila**

**Tel. +358 50 530 6320**

## **ABSTRACT**

**Author:** Ville Anttila  
**Title:** The Boundaries of a Firm in the Pulp and Paper Industry: Complementarities of the Resource-Based View and Transaction Cost Economics  
**Faculty:** Lappeenranta School of Business  
**Major:** Accounting  
**Year:** 2007  
**Master's Thesis:** Lappeenranta University of Technology  
97 pages, 6 figures, 16 tables  
**Examiners:** prof. Jaana Sandström  
prof. Ari Jantunen  
**Keywords:** Boundaries of a firm, pulp and paper industry, resource-based view, transaction cost economics, vertical integration, outsourcing

The purpose of this study is to characterize activities in a pulp and paper firm and to analyze how the boundaries of a firm in the pulp and paper industry are defined. Explorative in nature, this study is qualitative. Data was collected by theme interviews conducted in pulp and paper firms. The resource-based view and transaction cost economics are used as a theoretical framework to analyze the activities in a pulp and paper mill.

The structure of the firms can be held quite conservative. The theoretical framework can explain boundary choices rather well especially in core production activities. In support activities there were some conflicts between the framework and reality. Core production activities were found to be the activities which should be kept within the firm because of the high transaction cost and the fulfilled VRIN attributes. Most of the support activities can be considered trivial and in principle they could be outsourced. Some specialized support activities had strategic importance, and according to the results they should be held inside the firm's boundaries. However, in this respect the findings were somewhat inconsistent and more research is needed to draw final conclusions.

## TIIVISTELMÄ

**Tekijä:** Ville Anttila  
**Tutkielman nimi:** Yrityksen rajat sellu- ja paperiteollisuudessa: Resurssiperusteinen näkemys ja transaktiokustannusteoria  
**Tiedekunta:** Kauppatieteellinen tiedekunta  
**Pääaine:** Laskentatoimi  
**Vuosi:** 2007  
**Pro Gradu -tutkielma:** Lappeenrannan teknillinen yliopisto  
97 sivua, 6 kuviota, 16 taulukkoa  
**Tarkastajat:** prof. Jaana Sandström  
prof. Ari Jantunen  
**Hakusanat:** Yrityksen rajat, sellu- ja paperiteollisuus, resurssiperusteinen näkemys, transaktiokustannusteoria, vertikaalinen integraatio, ulkoistaminen

Tämän tutkimuksen tarkoituksena on tutkia sellu- ja paperiteollisuuden toimintojen luonnetta sekä miten yrityksen rajapinnat ovat muodostuneet ko. teollisuudenalalla. Tutkimus on eksploratiivinen ja luonteeltaan kvalitatiivinen. Tutkimuksen aineisto kerättiin yrityksissä tehdyillä teemahaastatteluilta. Sellu- ja paperitehtaan toimintojen analysoinnissa käytetään resurssiperusteista näkemystä ja transaktiokustannusteoriaa.

Tutkimuksen yritysten rakennetta voidaan pitää varsin konservatiivisena. Teoreettinen kehys pystyi selittämään varsinaisen tuotannon järjestämistä varsin hyvin. Tukitoiminnoissa löytyi ristiriitoja teorian ja todellisuuden välillä. Tuotantotoiminnot kannattaa pitää yrityksen sisällä, koska ne täyttävät VRIN-attribuutit ja niihin liittyy korkeita transaktiokustannuksia. Suurin osa tukitoiminnoista voidaan luokitella triviaaleiksi. Joitain tukitoimintoja voidaan kuitenkin luokitella strategisesti tärkeiksi, ja voidaan päätellä, että ne pitäisi pitää yrityksen sisällä. Tässä suhteessa tulokset olivat kuitenkin ristiriitaisia, ja lisätutkimuksia tarvittaisiin lopullisten johtopäätösten tekemiseen.

## **PREFACE**

This research is part of Technology Business Research Centre's Game Global II project, which studies the global change of strategies in pulp and paper industry. Major part of this research was done in Lappeenranta University of Technology between October and March. The study was finished in Jämsänkoski during March and April. Generally this project progressed quite well and we did not have any major difficulties.

I would like to express my gratitude to Professors Jaana Sandström, Ari Jantunen and our project manager Hanna Kuittinen for taking me into this project and for all the support you gave me. Special thanks to my colleague Marika Björnholm who was very helpful during this project. I would also like to thank our interviewees for giving us their time and good answers. I hope that the time they invested will be compensated by our results.

Last but not least. Thanks to my wife and to my dog for being there. I would also like to thank my parents for their support.

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Research Problem .....	4
1.2	Methodology.....	7
1.3	Structure of the study .....	8
<b>2</b>	<b>RESOURCE-BASED VIEW OF A FIRM.....</b>	<b>9</b>
2.1	Resources .....	9
2.2	Firm heterogeneity and resource immobility.....	13
2.3	Resources and sustainable competitive advantage .....	17
2.3.1	Value.....	20
2.3.2	Rareness.....	22
2.3.3	Inimitability .....	22
2.3.4	Non-substitutability .....	26
2.4	Resource-based view and boundaries of a firm .....	26
2.5	Criticism on the resource-based view.....	27
<b>3</b>	<b>TRANSACTION COST ECONOMICS .....</b>	<b>29</b>
3.1	Transaction cost economics.....	29
3.2	Transaction cost characteristics .....	31
3.2.1	Uncertainty and bounded rationality.....	33
3.2.2	Asset specificity, frequency and opportunism .....	35
3.3	Transaction cost economics and boundary choices of a firm .....	40
3.3.1	Benefits and costs of vertical integration.....	41
3.3.2	Benefits and costs of using markets.....	42
3.3.3	The combined effect of value creation and asset specificity.....	44
<b>4</b>	<b>EMPIRICAL ANALYSIS ON BOUNDARY CHOICES IN THE PULP AND PAPER INDUSTRY .....</b>	<b>47</b>
4.1	Data Collection.....	47
4.2	Value chain in the Finnish pulp and paper industry .....	49
4.3	Activities in a typical Finnish pulp and paper mill .....	55
4.4	Activities against the resource-based view.....	57
4.4.1	Valuable activities .....	58

4.4.2	Rare activities .....	62
4.4.3	Considerations on inimitability and substitutability .....	63
4.5	Activities against transaction cost economics .....	65
4.5.1	Specific activities.....	66
4.5.2	Uncertainty and activities in a mill .....	68
4.6	Boundaries of pulp and paper mills against a theoretical framework .....	70
4.7	Boundary analysis of pulp and paper mills.....	73
4.7.1	Production activities .....	74
4.7.2	Support activities of production .....	75
4.7.3	Shared activities.....	81
<b>5</b>	<b>CONCLUSIONS.....</b>	<b>83</b>
	<b>REFERENCES.....</b>	<b>89</b>

# 1 INTRODUCTION

In recent years the cost competitiveness of the Finnish pulp and paper industry has radically decreased because of new entries in South-America and Asia. At the same time the demand of the industry's core products has declined in the developed world. Globalization together with the development in information technology is creating pressure towards Finnish forest product companies. All this combined have led to declining profits. One way to face future competition and create competitive advantage is to redefine the boundaries of a firm. The question is now whether it is better to make or buy?

The Finnish forest cluster has been organized around the core production activity. Production efficiency, cost advantages and improved quality can be seen as main motivators in these boundary decisions, which take us back to the foundations of production centric thinking. Traditionally, the Finnish pulp and paper industry has vertically integrated consecutive stages of production even into a same plant. In practice this means that pulp and paper mills are located next to each other which enables efficient production and economical use of raw materials and energy. (Metsäteollisuus 2000, p. 24) Practically, the highly vertically integrated structure means that many pulp and paper companies operate along the whole value chain from raw materials (forests) to customers. This has enabled hedging against business risks and generating profits in the various phases of industry cycles. For example, in 2006 the most profitable businesses in the pulp and paper industry were pulp and newsprint that are less value added than higher paper and board grades. Outsourcing in the Finnish pulp and paper industry has not been up to its potential. This condition is a result from a strong labor union influence and conservative attitudes of management combined. (Pajarinen 2000, p. 66)

Recent value chain reforms in the Finnish forest cluster can be seen as a strategic response to new technology and market conditions. Intense competition and environmental change, which are very high-pace today, are affecting firms' choices about the structure and boundaries that will enable a fast reaction to changes occurring in the operational environment (see Sartorius & Kirsten 2005, p. 82). Outsourcing decisions can be concerned as part of the pulp and paper industry's value chain reform, the purpose of which is to react to the changes in the operational environment and to gain competitive advantage. Holmström & Roberts (1998, p. 73) have come to a conclusion that significant merger and acquisition activity over the past two decades is a strong indication that economically significant forces determine organizational boundaries. The strong consolidation trend has already shaken the industry due to acquisitions and mergers in the 1990s. The forest cluster's value chain is reforming and the increase in the value is moving towards its boundaries. The reason for this is clear: production processes are becoming more and more complicated, which increases demand for specialized service activities. Outsourcing in the pulp and paper industry is predicted to increase, and the competitive advantage is passed onto companies that can offer new innovations and control the information related to the manufacturing process. (see Pajarinen 2001, p. 53; Viitamo 2000, p. 61) Concentration on core competencies have led companies to consider using market options instead of hierarchy in non-core activities.

Teece (1996, p. 210) lists four different types of organizational structures: (1) solid, multiproduct, integrated hierarchies, (2) high-flex firms, (3) hollow corporations of various types, and (4) conglomerates of various types. Today's current firm organizations in the Finnish pulp and paper industry can be characterized as multiproduct integrated hierarchies. One future form to organize production is so called de-materialized company, in which all production activities are done by different suppliers. The core company is only working as a



supplier and customer manager, and it only owns a small amount of physical assets. (Arnold 2000) Some experts have even proposed that future firms in the paper industry will be divided into several pieces between owners, financiers, operators and marketers. In this view, the owner of the factory buys operating service from a maintenance or equipment provider. Forest product companies, which are nowadays vertically integrated, would only carry out marketing, distribution and development duties. (Viitamo 2000, pp. 30–31)

Make-or-buy decisions and boundary choices have an impact in the entire organization. Therefore outsourcing decisions should be seen in context with strategy, because those decisions are closely connected with critical factors such as future visions, structure, costs, core competencies and competitive advantage. (see Espino-Rodriguez & Padron-Robaina 2004; Gilley & Rash-eed 2000, p. 764; Humphreys et al. 2000, p. 353)

The background of this study lies in the need to get an external, neutral and critical view of the core activities and boundaries of the firm in the pulp and paper industry. There is a need to sort out the activities which could be outsourced and which have to be kept within the firm. Usually boundary choices are based on direct cost analysis, but the problem is that there are many strategic factors behind boundary decisions which cannot be traced by direct cost analysis alone. The purpose of this study is to see which factors are affecting boundary choices in the pulp and paper industry.

The theoretical background to the boundaries of a firm in the paper industry is mainly taken from the transaction cost theory and the resource-based view. The scope of the research is widened by taking value chain and strategic outsourcing as tools for considering the boundaries of a firm. The theoretical view to determining the boundaries of the firm has been gained by the transaction cost theory and resource-based view. The theoretical views were cho-

sen, because they have been used in previous research, they are complementary and, because of different premises, they may give different perspectives into the subject. It could be said that the resource-based view explains economic rents and the transaction cost theory explains the existence of firms (Conner 1991; Mahoney 2001, p. 655). According to the transaction cost theory and the resource-based view, boundary choices are driven by an estimate of benefits from co-specialization. Table 1 collects the main principles of the resource-based view and transaction cost economics.

**Table 1. Differences between the transaction cost theory and resource-based view (Madhok 2002).**

	<b>Transaction cost theory</b>	<b>Resource-based view</b>
<b>Broad theoretical arena</b>	Theory of <i>the</i> firm	Theory of <i>a</i> firm
<b>Primary theoretical question</b>	Why do firms exist	Why do firms differ
<b>Primary driver</b>	Search for efficient governance structure	Search for competitive advantage
<b>Primary domain of interest</b>	Exchange and transaction	Production and firm resources/capabilities
<b>Primary focus of analysis</b>	Transaction attributes	Resource attributes
<b>Primary emphasis</b>	(Transaction) Costs	Firm resources, skills, knowledge, routines

The study is part of Technology Business Center's Game Global II project, which analyzes the change in strategies fielded by pulp and paper industry companies in the new globalizing operational environment.

## 1.1 Research Problem

The research problem is to examine the nature of activities in the paper industry to get a rationalized view of the boundaries of the firm in the paper in-

dustry. The view will be gained through a core activities concept, which should give some guidelines about activities that should be held within the firm and about activities with the potential for outsourcing.

The problem has been examined by searching different characteristics, mostly from the theoretical base of the study. Activities will be divided and outlined into different units and hierarchies based on the activities' characteristics; for example, whether it is possible to characterize the activities by value creation, committed capital, sunk costs, knowledge intensity, asset specificity, path dependence, importance, coordination needs or interdependency with other activities. After classification, activity maps will be formed and interdependencies solved. It is also essential for problem solving to investigate the market supply for activities.

The main problem is to get a view of the present and future boundaries of a typical pulp and paper industry firm and analyze them in a theoretical framework.

The research questions are the following:

- How does the theoretical framework explain the existing boundaries of a typical pulp and paper firm?
- What kind of activities and resources are needed in the paper industry?
- How do the transaction cost theory and resource-based view explain the structure of the value chain in the paper industry?
- How can possible future boundaries be rationalized by a theoretical framework?
- What could be the optimal boundaries of a paper firm according to the theoretical framework?

The main objective of the research is to rationalize the boundaries of a firm in the paper industry and to get a view of the nature of its activities. The main objective has been accomplished by sub-objectives. The first sub-objective is to get a theoretical view of optimal boundaries, core activities, vertical integration and the value chain. The second sub-objective is to divide the activities of the paper industry into different units, study the nature of the activities, and place them into a theoretical framework and find out interdependencies. The third sub-objective is to get a view of the existing boundaries in a paper industry firm and to analyze it in a theoretical framework. The fourth sub-objective is to rationalize possible future boundaries of the firm in the pulp and paper industry. The boundaries of the firm have been examined to find ways to create competitive advantage and to increase profitability. The idea of the research is to be ruminative, so there will be no propositions for future action.

The branch of the research is restricted to the paper industry on the integrate level. The limited scope of research material restricts how the results of the study can be generalized.

The objective of the work is not to study the outsourcing process or options, and the values of resources or transaction costs are not measured in monetary terms.

The activities are intended to be defined on such a level that the study can be generalized to other firms and industries. However, definition of the activities has to be accurate enough.

## 1.2 Methodology

As a case study, this research is qualitative by nature, because there was not enough data or understanding on the subject in order to perform a quantitative study. The thesis is composed of two parts: theoretical and empirical. The theoretical part is mainly based on literature and scientific articles. The empirical part is based on interviews conducted with General Managers and Business Unit Managers in pulp and paper firms and experts familiar with the industry and its activities as a whole. Eight interviews were conducted in six separate mills. The duration of the interviews was between one and two hours depending on how the discussion progressed.

The research is qualitative, because the phenomenon is singular in its nature. Moreover, the research material supports the claim to be qualitative, because it is based on interviews and the analysis is tied to the material. It has to be taken into consideration that the sample did not enable a quantitative study to be performed. (Uusitalo 2001, pp. 80–81)

The interviews were semi-structured theme interviews. It is typical of the semi-structured interview method that some parts of the interview are fixed, but not all. In this chosen interview type, the order or the form of the questions can be changed and there are no pre-determined answers. Typically, in theme interviews it is known that the object has undergone some phenomenon and the researcher has orientated himself/herself with the parts, structure, processes and whole of the phenomenon. A theme interview is targeted to the object's subjective experiences of the phenomenon, which the study has analyzed in advance. (Hirsjärvi & Hurme 2001, p. 47) The interviews were based on two value chain figures and on a discussion framework. This was the only sensible way to study the subject, because there was not enough accurate information beforehand. The study is explorative in nature,

so its purpose is to accumulate knowledge about the phenomenon and to test how the phenomenon can be explained with the theoretical framework. In future it will be possible to conduct a survey or even quantitative research on the subject.

The final interpretation is based on findings made from the research material and other available information on the subject.

### **1.3 Structure of the study**

The study consists of two parts: theoretical and empirical. The theoretical part begins with introduction, and after that the resource-based view and transaction cost economies will be introduced. The basic idea of these chapters is to get a sufficient view on these theories to use them in the empirical part.

The empirical part consists of Chapter 4. It starts with introducing the data collection methods, value chain and activity charts of a production integrate in a typical Finnish pulp and paper firm, after which activities and resources will be characterized through the resource-based view and transaction cost economics. The last section presents a comparison of how the theoretical framework explains the boundary choices of a pulp and paper mill.

The final chapter will present conclusions. A brief look will be taken to see how this study has succeeded. The empirical findings will also be summarized.

## **2 RESOURCE-BASED VIEW OF A FIRM**

This chapter discusses the resource-based view of a firm. The purpose is to have a look at how firms' resources are affecting their performance and competitive advantage. Having analyzed the interdependencies between firms' resources and competitive advantage, the discussion will be broadened out to cover firms' optimal boundaries.

### **2.1 Resources**

A firm's resources include assets, capabilities, organizational processes, firm attributes and information knowledge controlled by the firm which enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness. Resources are, for example brand names, in-house knowledge of technology, and employment of skilled personnel, trade contracts, machinery, efficient procedures and capital (see Barney 1991; Amit & Schoemaker 1993; Wernerfelt 1984). It has been argued that only those assets that generate economic rents can be considered as resources (Godfrey & Gregersen 1999, p. 39).

According to the resource-based view, the firm competes by collecting and building up valuable resources. In this light the firm can be seen as a system that tries to find an optimal resource combination in which the resources are creating more value than in other possible combinations. (Das & Teng 2000, p. 36) In the resource-based view, team specific assets within the firm will be more specific to other teams inside the firm than to those outside the firm, and hence more productive (Conner, 1991, p. 142). An idiosyncratic combination of resources in a particular asset bundle at a particular point in time makes

resources unique. (Godfrey & Gregersen 1999, p. 42) According to Penrose (1959), the firm can be seen as a bundle of tangible and intangible resources and each firm is a unique combination of resources. Therefore, resource bases are heterogeneous. (Penrose 1959, p. 24) Sustained heterogeneity may become a possible source of competitive advantage, which will lead to economic rents (Das & Teng 2000, p. 32). Rumelt (1991) found that business unit effects outweigh industry and corporate membership as predictors of profitability. In other words, there exists some significant intra-industry heterogeneity.

However, resources are not valuable in themselves. They become valuable, because they allow a firm to perform activities that create advantages in particular markets. (Porter 1991, p. 108) Mathews (2002) describes resources as productive assets of firms, the means through which activities are accomplished. Services (activities), not resources, can be seen as inputs in production processes, and they are a function of the way how resources are used. The same resource can be used in several ways and combinations with other resources as to provide a different service or set of services. (Penrose 1959, p. 24)

Performing an activity always requires internal tangible and intangible resources to be used. Performing an activity or especially a linked group of activities creates capabilities, which are an essential part of the firm's performance. It has to be highlighted that performing activities depreciates tangible assets, but it is possible that at the same time intangible assets will accumulate and become an important part of the firm's balance sheet. Performing activities creates resources external to the firm, such as contracts and reputation, which help the firm to operate more effectively. When the firm performs its activities poorly, external resources will become liabilities instead of assets. (Porter 1991, pp. 102–103)



Basically the firm's resources can be divided into three different types: tangible assets, intangible assets and capabilities (Fahy 2000, p. 97). Grant (1991) uses six major categories to describe resources: financial, physical, human and technological resources, reputation, and organizational resources. Whereas, Barney (1991) classifies resources into physical capital, human capital and organizational capital.

Property-based and knowledge-based terms can be used to describe how different types of resources are protected from imitation. Property-based resources are based on legal rights even though they can otherwise be imitable. Knowledge-based resources are protected by different types of knowledge barriers. (Miller & Shamsie 1996, pp. 521–522)

Capabilities can be seen as an ability to deploy different resource combinations effectively. In simple terms they can be described as skills. (Amit & Schoemaker 1993)

**Table 2. Different types of resources.**

Miller & Shamsie	Property-based		Knowledge-based
Amit & Schoemaker; Fahy	Tangible	Intangible	Capabilities
Barney	<i>-Physical capital resources</i>	<i>-Human capital resources -Organizational capital resources</i>	<i>- Skills: e.g. reliable service, repeated process or product innovations, manufacturing flexibility, responsiveness to market trends and short product development cycles</i>
Grant	<i>-Financial assets -Physical assets</i>	<i>-Technological resources -Human resources -Reputation -Organizational re-</i>	

		<i>sources</i>	
--	--	----------------	--

Grant (1991) suggests that the most important resources are the ones arisen from integration of individual functional capabilities. These strategic capabilities are defined as core competencies by Prahalad & Hamel (1990). Arnold (2000) argues that only those resources that are usable for multiple purposes can be considered as core competencies, which should be held within the company in all conditions.

Resources that are readily obtainable from markets or easily imitable cannot be a noteworthy source of economic benefits (Barney 1986; Reed & DeFillippi 1990; Grant 1991). In theory it has been stated that tangible resources can be readily purchased from markets, so they cannot be a source of competitive advantage. Therefore, it can be concluded that resources other than tangibles will contribute more to the firm's success, because intangible assets can be more easily protected from duplication. This view has found some empirical support. However, this does not mean that tangible resources cannot be protected from duplication at all or that intangible resources are automatically protected from duplication. Galbreath found that organizational assets have a strong effect on the firm's performance, because they affect how capabilities are developed and utilized. In addition, reputational assets have also been found important, and they indeed have an effect on financial and social performance of the firm. Despite the fact that, at least in theory, tangible assets are not regarded as high value assets, they may still have a role in creating a source of economic rents. Physical and financial assets can be leveraged to create competitive advantage, if the firm can create barriers to duplication. (Galbreath 2005, p. 980) Tangible assets, if valuable, are easily appropriated by the firm, but they could not be considered as key resources, because they are easily duplicated by rivals (Clulow et al. 2003, p. 229).

Miller and Shamsie (1996) found in their study that control over property-based resources resulted in superior performance during periods of stability. During periods of change the situation was opposite: knowledge-based resources resulted in superior performance.

In some cases control over the brand name can be kept as a critical asset, because it enables the firm to dictate how relationships among the various players are to be organized (Holmström & Roberts 1998, p. 85).

## **2.2 Firm heterogeneity and resource immobility**

The basic assumption in the resource-based view is that firms within an industry may be heterogeneous so that they differ in strategic resources they control. A second assumption is that these resources are not perfectly mobile, and thus heterogeneity can be long-lasting. (Barney 1991, p. 101; Watjarakul 2005, p. 392)

Resource immobility means that some of the resources are either costly to copy or inelastic in supply. If the firm with these resources (1) can exploit opportunities or neutralize threats, (2) the resources are possessed by only a small number of firms, and (3) if they are costly to copy or inelastic in supply, they may be potential sources for sustainable competitive advantage. (Barney 1991 & 1996, p. 142) The requirement of scarcity designates that there are not enough resources to satisfy demand. Inelastic supply means that there may be fixed factors which cannot be expanded or quasi-fixed factors so that supply cannot be increased rapidly. Therefore, it can be concluded that firms with superior resources can earn Ricardian rents. (Peteraf 1993, p. 180)

It has been argued that in general firms cannot find any sustainable competi-

tive advantage in conditions where resources are homogeneous and perfectly mobile, but this is only related to resource rents. If all the firm's resources are identical with those of other firms in the industry, it could be concluded that all firms can implement same strategies and improve their efficiency and effectiveness to the same extent. In this kind of situation, it is impossible to enjoy sustainable competitive advantage. The general availability of resources neutralizes special advantages. (Barney 1991; Grant 1991; Miller & Shamsie 1996) Without imperfections in strategic asset markets, firms can only hope for normal returns (Peteraf 1993, p. 185).

As a counter-argument, it has been suggested that first-mover advantages and entry/mobility barriers can be a source of competitive advantage, but this can be considered a false reflection. In order to be the first mover, the firm must possess a unique resource which makes it better informed about opportunities and makes it possible to react before others. This has been supported by Porter (1991) who stresses that we have to ask the question *why* someone is a first mover or has exploited mobility barriers such as economies of scale. Also, the firms protected by entry/mobility barriers can be considered to implement different strategies than firms seeking to enter these protected areas of competition. If resources are perfectly mobile, any resource that allows firms to implement a strategy protected by barriers can easily be acquired by firms seeking to enter the industry. These barriers only become sources of competitive advantage when resources are heterogeneously distributed between firms and when these resources are imperfectly mobile. (Barney 1991)

The basic determinant of imperfect markets is asymmetric information across the resource markets. In imperfect markets efficient trading is impossible, because sellers and buyers do not share all relevant information of the nature and value of resources. If all the actors in strategic factor markets have ex-

actly the same and accurate information on the future values of assets, the price of these resources will be the same as their discounted future value. Under perfect information conditions the holders of these resources will not sell until the price of these resources is reflected by their future value. On the other hand, perfect market conditions will increase competition over those resources that will lift up prices until no one can generate above normal returns. In imperfect conditions some actors can overestimate or underestimate the future values of resources in factor markets, which will create opportunities for firms owning better information. In conclusion, asymmetric information makes it possible to gain rents or avoid economic losses through superior information. (Barney 1986; Godfrey & Gregersen 1999, p. 45) Asymmetric information can be handled as one ex-ante barrier against competition of resources (Peteraf 1993).

Some resources are not perfectly traded, because they are either mingled with other resources or embedded in organizations (Chi 1994). Some resources can be described as system resources, which mean that they are made up of a complex network of resource factors. Complexity means that there are many direct and indirect dependencies between a large number of resource factors and the definite boundaries of the system resources are hard to measure. (Black & Boal 1994, p. 135) This makes monetary valuing of the resource troublesome. Amit & Schoemaker (1993) state that especially capabilities may become subjects to market failures.

Imperfect markets on strategic resources have meant that only alliances, mergers and acquisitions provide an opportunity to trade otherwise non-tradable resources or to trade resources in bundles (Wernerfelt 1984; Das & Teng 2000; Chi 1994). Chi (1994) adds that resources can also be traded by purchasing the resource's service from the firm that possesses it or by transferring skills and organizational routines. These two ways of trading resources

do not necessarily eliminate the rent generating potential of the resources for its present employer. A firm must develop those resources itself that are needed, but not traded on open markets. Otherwise it cannot survive. (Dierickx & Cool 1989)

Alliances and contractual agreements are useful when firms have a need to exchange resources or complement their existing resource base. With alliances it is possible to get all the advantages of using complementary resources without owning them. This is especially useful when both parties can exploit economies of scale due to specialization. (Chen & Chen 2003; Yasuda 2005) There are some situations where the value of capabilities expected from an acquired firm is reduced after the transaction has taken place. Under these conditions alliances become more viable alternatives than acquisitions. (Barney 1999, p. 142)

Usually in acquisitions the purchase can be carried out at short notice, but it can take significant time to *absorb* the acquisition. Absorption usually involves time-consuming and often uncertain management processes such as training the personnel and instituting new management procedures. Nevertheless, the time required for the absorption will probably be less than the time required for attempts to develop a capability internally through learning. (Argyres 1996)

The heterogeneity and imperfect transferability of most intangible resources precludes the use of market prices. One way to value intangible resources is to take the difference between the firm's stock market value and the replacement value of its tangible assets. (Grant 1991, p. 119)

## **2.3 Resources and sustainable competitive advantage**

The generation of above normal returns or economic rents can be used as a tool to analyze competitive advantage (Porter 1985, see Mahoney & Pandian 1992). Above normal returns come in addition to the normal (average) rate of return received in the industry because of competitive advantage held by the firm (Walker 1988, p. 64). Economic rents are created when the firm is able to collect excess returns on resources limited in supply. There are some other views on rents, for example that the rents are the difference between the resource's best and second best use, or payments above the minimum level required to make input available for use. In simple terms, asset combinations that produce value in excess of their development or acquisition costs create rents (see Godfrey & Gregersen 1999, p. 43). Competitive advantage is a result of the firm's ability to perform its activities better than its competitors. Competitive advantage can be gained either by performing activities at a lower cost than rivals or by adding unique value to the products, and hence allowing the firm to command a premium price. (Porter 1991, p. 102)

The source of economic rents is scarcity and the rents will vanish if the supply of a particular resource is not fixed at least in short term. (Schoemaker 1990, pp. 1179–1180) By eliminating its competitors' appropriation of rent generating resources the firm can maintain its rival position (Black & Boal 1994, p. 146). Competitive advantage established by employing strategic resources creates rents classified as organizational rents (Amit & Schoemaker 1993, p. 36).

Defined as the inability of current and potential competitors to duplicate the crucial strategy, sustainable competitive advantage does not mean that the firm can forever sustain its competitive advantage. However, radical changes in the industry's structure may erode the firm's competitive advantage, and

the resources previously considered as strengths may become weaknesses. These changes are called *Schumpeterian Shocks*. (Barney 1991, pp. 102–103; Porter 1991, p. 103) The changes can be either technological or social changes in the market (Reed & DeFilippi 1990, p. 94). Poppo and Zenger (1998) argue that under rapid technological change and heavy uncertainty, the firm's increased specificity in an internal activity can damage performance. The zero transaction cost setting does not erode the rent generating potential of resources, because the setting does not suggest long-term perfect competition (Foss, K. & Foss, N.J. 2005, p. 546).

In the resource-based view, the value creating resource is valuable, rare, imperfectly imitable and non-substitutable (Barney 1991, pp. 105–106). These attributes can be thought of as empirical indicators how heterogeneous and immobile the firm's resources are. In this light, it could be concluded that sustained competitive advantage can only be created by building up resources that fulfill these requirements. However, there are also other definitions for resources creating competitive advantage, which are presented below in Table 3 in relation to Barney's definitions. For example, Grant (1991) defines the determinants of resources that are capable of being the source of competitive advantage as including durability, transparency, transferability and replicability. He also adds that the firm must have a clear ownership and control of the resources. Amit and Schoemaker (1993) list eight different determinants: complementarity, scarcity, low tradability, inimitability, limited substitutability, appropriability, durability and overlap with strategic industry factors. Also, Collis and Montgomery (1995) have made a list of five attributes needed for resources creating competitive advantage: inimitability, durability, appropriability, substitutability and competitive superiority.

As we can see from Table 3., Barney's determinants embody all the characteristics suggested by other authors. Therefore, we can conclude that deter-

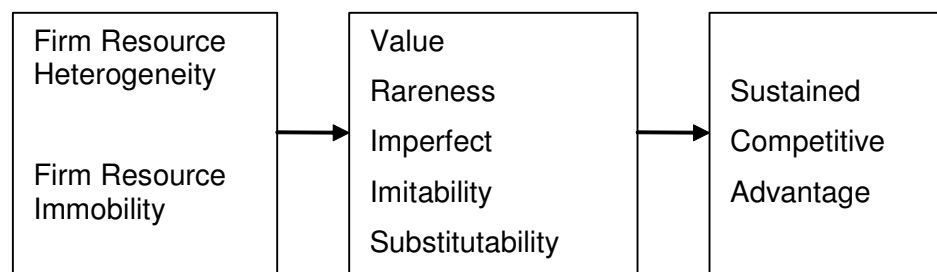


minants defined by Barney are the easiest and the most comprehensive way to describe resource heterogeneity and immobility. The potential competitive advantage and economic rents depend on all four criteria combined (Godfrey & Gregersen 1999, p. 4).

**Table 3. VRIN attributes.**

<b>Barney (1991)</b>	<b>Valuable</b>	<b>Rare</b>	<b>Inimitable</b>	<b>Non-substitutable</b>
<b>Grant (1991)</b>	<i>Durability</i>	<i>Transferability</i>	<i>Transparency</i>	<i>Replicability</i>
<b>Amit &amp; Schoemaker (1993)</b>	<i>Complementarity Appropriability Durability Overlap with strategic industry factors</i>	<i>Scarcity Low tradability</i>	<i>Inimitability</i>	<i>Limited substitutability</i>
<b>Collis &amp; Montgomery (1995)</b>	<i>Durability Appropriability Competitive superiority</i>		<i>Inimitability</i>	<i>Substitutability</i>

Figure 1 above builds up a view of how firm resource heterogeneity and the imperfect mobility of resources create sustainable competitive advantage.



**Figure 1. Creation of competitive advantage (Barney 1991).**

### 2.3.1 Value

In order to create competitive advantage, the resource must be valuable to the firm. It can be considered valuable when it exploits opportunities or neutralizes threats in a firm's environment. (Barney 1991, p. 106) Valuable resources have a direct impact on the firm's economic performance by reducing costs or increasing revenues (Barney 1996, pp. 147–148).

Ex-ante limits to competition must exist to make resources valuable, because otherwise the costs of acquiring resources will be too high to generate rents. Without differences in the ex-post value and ex-ante costs there will not be any rents. Profits come from ex-ante uncertainty. (Peteraf 1993, p. 185)

Asset complementarity and firm specificity affect performance so that assets will be more valuable in the firm than in other firms. Complementarity suggests that the assets will be more valuable when combined than individually. Firm specificity combined with transaction costs will make particular assets more valuable for certain firms than others. (Amit & Schoemaker 1993, p.39; Balakrishnan & Fox 1993; Chi 1994) The rent potential of an asset increases when it is more specific to the firm than to other firms (Conner 1991, p. 137). Asset specificity has been seen as a positive, value adding feature in the resource-based view (Poppo & Zenger 1998).

Durability increases value by decreasing the need for investments required to offset their depreciation (Grant 1991; Amit & Schoemaker 1993, p. 39). The longer lasting the resource is, the more valuable it will be (Collis & Montgomery 1995).

Appropriability is used to measure the distribution of profits created by resources. The created value is always subject to bargaining among different

stakeholders. The owner of the resource does not always collect all the created value. (Collis & Montgomery 1995) The bargaining power of suppliers and customers combined with competition from alternative resource bundles have an effect on profitability and rent appropriation (Porter 1991, p. 108). Vertical integration through financial ownership helps firms to protect their value creating aspects of resources (see Mahoney 1992, p. 566). In order to be fully protected from value erosion, resources must be protected from all kinds of capture (Foss, K. & Foss, N.J. 2005, p. 545).

Employee mobility, identifiable contributions and dependence on the skills of employees increase the bargaining power of employees. A great share of value added by a few key specialists can be appropriated off the firm. The firm's strong control on necessary complementary resources, such as reputation, proprietary technology, fixed asset base, relationship between individual skills or organizational routines, and troublesome identification of contributions can balance the situation in favor of the firm. (Grant 1991; Lippman & Rumelt 2003) The firm has an empty core when its key resources can be transferred with its employees (Lippman & Rumelt 2003).

At a certain point in time, the resources creating competitive advantage have become under the influence of market failures. These market failures will be referred to as strategic industry factors which determine the relationship between the firm and the industry. They are characterized by their proneness to market failures and subsequent asymmetric distribution over firms. These particular factors are determined at the market level through complex interactions among the firm's competitors, customers, regulators, innovators external to the industry and other stakeholders. (Amit & Schoemaker 1993, p. 36) Industry factors have a great influence in making resources valuable (Porter 1991, p. 108).

### **2.3.2 Rareness**

By the resource-based view's definition, a resource possessed by a great number of competitive firms cannot be a source of competitive advantage. If a particular valuable firm resource is possessed by a large number of firms, then each one of these firms is able to exploit the resource the same way; therefore implementing a common strategy will not give any sustainable competitive advantage. This can be applied to bundles of valuable firm resources used to conceive of and implement strategies. Hence some strategies requiring a mix of different resources will be a source of competitive advantage, if those resources can be considered rare. In sum, managerial talent could be considered as a resource needed in implementing almost all the strategies. (Barney 1991, p. 106)

A resource can be considered rare even if there is more than one firm possessing that particular resource. A resource is a potential source of competitive advantage as long as the number of firms possessing the resource is less than the number of firms needed to generate perfect competition dynamics. (Barney 1991, p. 107)

However, a firm should not dismiss valuable, but common resources as unimportant. Valuable and common resources help the firm to create competitive parity and increase their probability to survive in it. (See Barney 1991, p. 107)

### **2.3.3 Inimitability**

Valuable and rare resources can be considered as sources for competitive advantage only when firms that do not possess these resources cannot ob-

tain them. (Barney 1991, p. 107) Firms that do not possess those resources are in cost disadvantage compared to those that already possess them. These kinds of resources are imperfectly imitable. (Barney 1996, p. 151)

In order to generate rents, firm heterogeneity must be durable; so there must be some barriers that limit ex-post competition. These ex-post barriers make resources imperfectly imitable. (Peteraf 1993, pp. 182–183) Nevertheless, imitation does not destroy all the value of the resource. It merely reduces the uniqueness of the resource, which erodes the value of the resource. (Godfrey & Gredersen 1999, p. 40)

According to Dierickx and Cool (1989) and Barney (1991), there are three main reasons why some resources are inimitable. Moreover, physical uniqueness is added to the list, although it can be included in the first three reasons.

- 1.) Unique historical conditions: time compression diseconomies and asset mass efficiencies
- 2.) Causal ambiguity
- 3.) Social complexity: interconnectedness of asset stocks
- 4.) Physical uniqueness

Unique historical conditions mean that the low-cost acquisition or development of the resource for a particular firm has depended on certain unique historical conditions. This can be accomplished by exploiting first-mover advantages or by path dependence. In the first case it is possible for other firms to exploit an opportunity, but it is very costly, because the first-mover has already exploited advantages, such as learning curve effects, and there are *time compression diseconomies*, because of which resources cannot be developed just by throwing in money. Secondly, the performance of a firm does not simply depend on the industry structure within which a firm finds itself at a particular point in time, but also on the path a firm followed through history to

arrive where it is. If a firm obtains valuable and rare resources, because of a unique path through history, these resources cannot be duplicated by competitors, because they can only be obtained through that unique path of history. Conceptually both cases can include *asset mass efficiencies*, when a firm can exploit scale advantages in accumulating resources. (Barney 1991 & 1996; Dierickx & Cool 1989, pp. 1507–1508) In addition, economic deterrence can be included in the list. It occurs when sizable, specific and scale sensitive investments are required to compete in the market with limited market potential. Basically the investments can be replicated, but the threat of intense competition and economic losses will keep imitators out. Basically the question is about economies of scale. (Collis & Montgomery 1995, pp. 121–122) Unique historical conditions will make markets *incontestable* where the discounted value of future cash flows facing a new entrant does not exceed the costs of entering the market (Godfrey & Gregersen 1999, p. 46).

Causal ambiguity exists when resources controlled by a firm and a firm's sustained competitive advantage are not understood or are understood imperfectly. When the link between resources and competitive advantage is not clear it is difficult for firms that are attempting to duplicate a successful firm's strategies to know which resources they should imitate. Under causal ambiguity it is unclear that described resources are the sources for competitive advantage. Nevertheless, causal ambiguity has to be on the same level for firms that possess resources and firms that try to imitate those resources. If a firm with competitive advantage understands the links between resources and competitive advantage, other firms can also learn the links, acquire necessary resources and implement relevant strategies. In order for causal ambiguity to be a source of competitive advantage all the rival firms must have an imperfect understanding of the links, or otherwise information will be diffused to all the competitors, thus eliminating causal ambiguity. (Barney 1991, pp. 108–110) Reed and DeFillippi (1990) propose that causally ambiguous activities

and competences have the characteristics of tacitness, complexity and specificity. Sustainable competitive advantage can be created only by reinvesting into the characteristics mentioned, which takes us to the question of durability discussed before.

Social complexity means that the resources the firm possesses may be very complex social phenomena, beyond the ability of firms to systematically manage and influence. For example, interpersonal relations, the firm's culture, its reputation among its suppliers and customers can be considered socially complex. Usually complex physical technology cannot be a source of competitive advantage, because it is typically imitable. However, the exploitation of physical resources often requires the use of complex social resources. (Barney 1991, p. 110) Grant (1991) claims that complexity is a relevant factor in the sustainability of competitive advantage. However, he does not draw a line between social complexity and other types of complexities.

Physical uniqueness makes resources by definition inimitable. Physical uniqueness is based on legal rights or special conditions (Collis & Montgomery 1995, pp. 121–122). Barney (1996) even lists patents as the main source of inimitability. Resources such as land could be considered as scarce resources, when property rights are clearly defined. Property rights can convert otherwise imitable resources into inimitable, which makes it possible to appropriate economic rents. (Lippman & Rumelt 2003, p. 1076; see Teece 1996, p. 210) Miller & Shamsie (1996) argue that legally protected resources are almost impossible to imitate. Property rights enable a resource owner to create, protect, appropriate and sustain the value of resources (Foss K. & Foss N.J. 2005, p. 542).

### **2.3.4 Non-substitutability**

The non-substitutability requirement of inimitability means that there should not be strategically equivalent resources that are themselves either not rare or imitable. Strategically equivalent resources enable these resources to be separately exploited to implement the same strategies. Strategically equivalent resources can be similar or very different. (Barney 1991, pp. 110–112) The existence of substitutes does not mean that a particular firm resource cannot be a source of sustained competitive advantage. In addition, these substitutes have to be common, or highly imitable, or both. (Barney 1991, p. 114)

## **2.4 Resource-based view and boundaries of a firm**

According to the resource-based view, inputs traded in the market should be procured from the market, because they are unlikely sources of competitive advantage. Cost benefits and concentrating on core competencies make outsourcing an attractive option. (Conner 1991, p. 137; Gilley & Rasheed 2000, p. 769) The resource-based view suggests that a firm's boundaries are settled by core activities, on which the firm is focusing its limited resources (see Sartorius & Kirsten 2005, p. 82). Firms should try to find an optimal resource boundary, where the value of the resources is better realized than in other combinations (Das & Teng 2000, p. 36). The firm should simply outsource the activities in which it lacks superior capabilities (Poppo & Zenger 1998). Acquiring capabilities from external sources may even help the firm to leapfrog over some stages in the learning curve (Argyres 1996).

When the cost of the hierarchical governance mode becomes too high, a firm should choose non-hierarchical governance to gain access to capabilities.



Firms have to understand conditions where the hierarchical governance mode is too costly and use this knowledge in boundary decisions. Opportunism should be handled as part of the total cost of accessing capabilities that cannot be acquired or developed internally cost-effectively. (Barney 1999, p. 143)

Table 4 constructs a view of how VRIN attributes affect boundary choices. As was discussed earlier, only the activities that fulfill all the VRIN attributes should be insourced in all conditions. Activities that are a source of temporary competitive advantage are potential activities for outsourcing, but a firm should be careful in order to protect its profits. It is possible that transaction costs will increase and erode all the advantages attainable with outsourcing. Activities that fulfill only the precondition of value should be outsourced.

**Table 4. VRIN attributes, competitive advantage and boundary choices.**

<b>Valuable</b>	<b>Rare</b>	<b>Inimitable</b>	<b>Non-substitutable</b>	<b>Advantage position</b>	<b>Performance</b>	<b>Boundary choice</b>
Yes	No	No	No	Competitive parity	Normal return (short term)	Outsource
Yes	Yes	No	No	Temporary advantage	Above normal return	Consider outsourcing
Yes	Yes	Yes	No	Temporary advantage	Above normal return	Consider outsourcing
Yes	Yes	Yes	Yes	Sustainable advantage	Superior	Insource

## 2.5 Criticism on the resource-based view

According to Arend (2006), there are no satisfying empirical tests made on the resource-based view (RBV). He states that there are no studies that have successfully measured the benefits specified by the RBV or adjusted cost and

benefits of the resources. He adds that scientific validity is compromised, because almost all the studies have been based on ex-post identification of resources.

Priem and Butler (2001) argue that the RBV does not meet all the criteria set for a theoretical system. They also argue that the view makes implicate assumptions about markets, the fundamental value variable is exogenous to the RBV, its contextual borders are difficult to establish and it has a static nature. Static nature causes some difficulties to understand why and how something happens. For example, the ability to learn to learn is simply just characterized as a normal resource.

Some critics argue that RBV logic is paradoxical and contains many contradictions and ambiguities (Lado et al. 2006).

Causal ambiguity both generates and frustrates sustainable competitive advantage. One of the basic assumptions in the RBV is that the ability to measure a resource may erode the ability of the resource to create competitive advantage. There have been some concerns that this condition reduces the credibility of empirical measurement of the resource-based view. (Lado et al. 2006)

### **3 TRANSACTION COST ECONOMICS**

The transaction cost theory tries to explain why firms exist and uses a single transaction as a basic unit of analysis (Williamson 1985, p. 18; Williamson 1991, p. 281). The theory was first introduced by Ronald Coase in the 1930s and later improved to its current form mostly by Oliver Williamson in the 1980s. The purpose of this chapter is to take a look at how transaction cost economics can be used in defining the boundaries of a firm.

#### **3.1 Transaction cost economics**

The base of the transaction cost theory lies in Coase's study, conducted already in the 1930s, in which he found that there are some costs of using the price mechanism. These costs related to discovering the market prices and have come to be known as transaction costs. Transaction costs can be seen as costs of running the economic system (see Williamson 1985, p. 18). Coase's definition of transaction costs included only direct costs related to contracting, negotiating, inspections, arrangements, and so on. He concluded that avoidance of these costs carrying transactions through the market could be the reason for the existence of firms in which resource allocation is done through administrative decisions. (Coase 1992, p. 715)

An entrepreneur chooses the internal transaction mode, when they can carry out their functions at a lesser cost than the market. The firm becomes larger when additional transactions are organized by the entrepreneur and smaller as they abandon the organization of such transactions. When the firm is growing the cost of organizing additional transactions within the firm may rise. Finally, at some point carrying out transactions in the open market or by an-

other firm becomes a more cost-effective way to organize the production. So, in conclusion, firms tend to expand until the transaction can be carried out at an equal cost by means of exchange. (Coase 1937, pp. 22–23) Balakrishnan & Wernerfelt (1986) state that the span of the firm may be optimally chosen at the margin where the incremental cost of administering an additional transaction internally is equal to the marginal savings in external transaction costs.

Williamson adds indirect transaction costs to the theory, which are also known as opportunity costs (see Rindfleisch & Heide 1997, p. 31). He also assumes that governance through the market is superior to internal governance, unless transaction costs are high enough. (see Holmström & Roberts 1998, p. 77) Coase's framework recognizes only market and hierarchical modes, but the more modern transaction cost framework also recognizes hybrid forms of governance (Williamson 1991).

In conclusion, the basic idea of the transaction cost theory is that when transaction costs are high enough to exceed the production costs and the advantages of the market, firms will favor internal organization (Rindfleisch & Heide 1997, p. 32). In accordance with the transaction cost theory, basically all activities can be produced internally as well as externally (Conner, K. 1991, p. 142).

Williamson (1985, p. 90) lists three main differences between the market and internal organization: (1) Market promotes high-powered incentives, (2) markets can sometimes aggregate demands to advantage (economies of scale and scope), and (3) internal organization has access to distinctive governance instruments. The costs of management or bureaucracy can be considered as costs related to administration, control, monitoring and costs of using low power incentives (Blomqvist et al. 2002).

The effect of transaction costs can be presented with equations as follows:

Internalize:  $\text{Market cost} + \text{Transaction costs} > \text{Production costs} + \text{Bureaucracy costs}$

Externalize:  $\text{Market cost} + \text{Transaction costs} < \text{Production costs} + \text{Bureaucracy costs}$

### **3.2 Transaction cost characteristics**

A modern transaction cost framework is based on bounded rationality, opportunism, asset specificity and uncertainty, which are the main determinants behind transaction costs. Risk neutrality and frequency can also be added to the list, but they have had limited attention in research. (see Rindfleisch & Heide 1997, p. 31)

Table 5 establishes a view of sources and types of transaction costs. As we can see in Table 5, transaction costs can be divided into direct and indirect costs, which arise from coordinating and motivating problems. Direct costs are related to coordinating transactions, because a firm must determine prices and other details of the transactions. The second source of direct transaction costs is incompleteness, which arises from a situation where parties do not have all the relevant information needed to determine the terms of an agreement or whether these terms are met. Imperfect commitment can be considered a major source of indirect transaction costs. Imperfect commitment is related to asset specificity and a threat of opportunism. (Milgrom & Roberts 1992, pp. 29–30) Ultimately, direct costs arise from managing the relationship and opportunity costs from making an inferior governance choice (Rindfleisch & Heide 1997).

Table 5. Sources and types of transaction costs (Rindfleisch &amp; Heide 1997)

	<b>Asset Specificity</b>	<b>Environmental Uncertainty</b>	<b>Behavioral Uncertainty</b>
<b>A. Source of Transaction Costs</b>			
Nature of Governance Problem	<i>Safeguarding</i>	<i>Adaptation</i>	<i>Performance Evaluation</i>
<b>B. Type of Transaction Costs</b>			
Direct Costs	<i>Costs of crafting safeguards</i>	<i>Communication, negotiating and coordination costs</i>	<i>Screening and selection (ex ante)</i>
			<i>Measurement (ex post)</i>
Opportunity Costs	<i>Failure to invest in productive assets</i>	<i>Maladaptation: Failure to adapt</i>	<i>Failure to identify appropriate partners (ex ante)</i>
			<i>Productivity losses through effort adjustments (ex post)</i>

Table 6 above shows how bounded rationality, opportunism and asset specificity affect the contracting process. In this case uncertainty is assumed to be of non-trivial degree and each condition presented in Table 6 can take two degrees: significant (+) or absent (0). In the first case the threat of opportunism is clear, but because bounded rationality is absent all the relevant issues of the contract can be settled in the planning phase ex-ante. In the second case asset specificity and bounded rationality exist, but because opportunism is absent, the partner's word can be trusted. In the third case, the absence of asset specificity enables markets to be fully contestable. Market competition erodes the hold-up problem, and in the case of opportunistic behavior a partner can merely be changed. In the last case where all three conditions have a significant effect, planning is incomplete, promises break down and the pair

identity of the partners clearly matters. In this situation, governance is the preferred mode to organize transactions. (Williamson 1985)

**Table 6. Attributes of the contracting process (Williamson 1985, s. 31)**

Behavioral assumptions				Implied contracting process
Bounded rationality	Opportunism	Asset specificity		
0	+	+		Planning
+	0	+		Promise
+	+	0		Competition
+	+	+		Governance

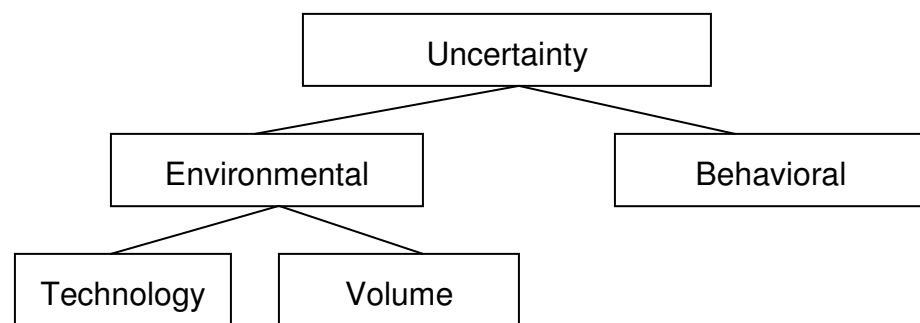
### 3.2.1 Uncertainty and bounded rationality

Uncertainty in the transaction cost approach can be divided into environmental and behavioral uncertainty. Uncertainty over complex conditions makes it impossible to determine in advance what should be done in every possible contingency (Milgrom & Roberts 1992, p. 32) Environmental uncertainty rises from conditions, where the circumstances surrounding the exchange cannot be specified ex-ante. Basically environmental uncertainty is an adaptation problem because of difficulties with modifying agreements to changing circumstances. Behavioral uncertainty is a consequence of difficulty to measure the exchange partner's performance ex-post, such as component quality or production processes. (Rindfleisch & Heide 1997, p. 31) Environmental uncertainty can be divided into technological and volume unpredictability (Walker & Weber 1987, p. 590; Heide & John 1990, p. 28).

Volume uncertainty means inability to accurately forecast the volume requirements in the relationship. The volatility of the downstream market and the manufacturer's share of their market both affect unpredictability, which

requires a firm to develop mechanisms for adaptation. One way to respond to volume uncertainty is to design procedures for sequential decision-making within ongoing relationship, thereby economizing on the difficulty of making changes. (see Heide & John 1990, p. 28)

Technological uncertainty exists, because there may be some changes in the standards or specifications of the components or the end product, or in general technological development (see Heide & John 1990, p. 28). In the resource-based literature these changes are usually referred to as *Schumpeterian Shocks*. In contrast to volume uncertainty, technological uncertainty is best managed with loose and lower continuity commitments with exchange partners. With loose and transient linkages firms retain flexibility to switch to partners with more appropriate capabilities. A highly volatile industry characterized by frequent technological change will be unattractive for high levels of integration. (Balakrishnan & Wernerfelt 1986; see Heide & John 1990, p. 28) However, the adjustment costs of technological change can only be externalized when there are many alternative sources of supply (Walker 1988, p. 70).



**Figure 2. Uncertainty.**

Technological or volume uncertainty combined with a thin supplier market increases transaction costs, because an opportunistically behaving supplier



may charge premiums in a case of volume adjustments or technological change. However, in one study the increase in transaction costs was found to be larger in volume adjustments than in technological change when the supplier was under strong competition. (Walker & Weber 1987)

Transaction cost economics assumes that human agents are subject to bounded rationality, so that behavior is intendedly rational, but only limitedly so (see Williamson 1985, p. 30). Bounded rationality makes contracts incomplete, because it is impossible to describe all the possible contingencies in transactions so accurately that there would be no motivation problems. The condition of bounded rationality is a result of inability to foresee all circumstances, costliness to prepare calculations and contract, and finally the problem of the imprecision of language. (Milgrom & Roberts 1992, pp. 126–131) The bounded rationality problem affects ex-ante when circumstances surrounding an exchange cannot be specified and ex-post when performance cannot be easily verified (Rindfleisch & Heide 1997). In conclusion, bounded rationality prevents the decision-maker's ability to create contracts, which take all possible events into account.

### **3.2.2 Asset specificity, frequency and opportunism**

High asset specificity increases transaction costs because of the implications of the supplier's opportunistic behavior (Walker 1988). Asset specificity is used to describe how well an asset can be redeployed to alternative uses and by alternative users without sacrificing productive value. Transaction specific human and physical assets are required to support exchange and are specialized in the exchange relationship. The value of these assets would largely be lost, if the relationship was terminated, because their value outside the relationship is very low. (Williamson 1991, p. 281; Heide & John 1988, p. 21)

Because of these characteristics, transaction-specific assets pose a contractual hazard for the agency, in the form of exchange partner exploiting or appropriating these particular assets (Heide & John 1988). The problem is that the buyer becomes locked in (hold-up problem) with the supplier, and changing the supplier is very costly because of high switching costs (Walker 1988, p. 65). Hold-up problem means that, having made the investment, the contractual party is forced later to accept disadvantageous terms after the costs are sunk (Milgrom & Roberts 1992, p. 136). Low market competition of specific assets does not restrain the supplier's opportunism (Rindfleisch & Heide 1997). Balakrishnan and Fox (1993) suggest that asset specificity may reduce the ability to finance these assets with debt, because of their low redeployability.

Roodhott and Warlop (1999) argue that the existence of sunk costs do not necessarily create asset specificity. They argue that any historical investments in an activity conducted currently should be treated as sunk costs, because they are backward-looking. Only future and relevant cash flows should be taken into account. In outsourcing decisions asset specificity is forward-looking and should be taken into account.

The potential for higher loss provides the supplier an opportunity to bargain for a greater share of the value of the relationship (Walker & Poppo 1991, p. 1). Therefore, the fundamental concern of transaction cost analysis is to safeguard a transaction specific asset against the threat of opportunism (see Heide & John 1988; Williamson 1985). Safeguards enable a firm to invest safely in production specific assets that could not otherwise be deployed. The absence of safeguards reduces the value of the assets because of appropriation. This all will result in reduced returns. (Heide & John 1988, p. 25)

High asset specificity increases potential losses, thus firms with high level of

specific assets can improve their performance by improving the replaceability of their exchange partners (Heide & John 1988, p. 25). Usually increasing asset specificity reduces the number of suppliers (Walker 1988, p. 65). Hence, in a thin supplier market it may pay to make rather than buy, even though buying may look attractive because of high production costs. This conclusion can be confirmed by Adelman (see Mahoney 1992, s. 562).

Dependence on the vendor is increased when (1) outcomes are important or high valued, or supplier provides large fractions of the business (magnitude), (2) outcomes are comparatively higher than in other possible alternative relationships, (3) fewer alternative sources of exchange are available to the focal party, and (4) fewer potential alternative sources of exchange are available. (Heide & John 1988, p. 23)

There are six reasons for asset specificity:

1.) Site specificity

- A condition where successive stages of production are located in close proximity to one other. Asset immobility is a dominant factor because of a heavy setup and relocating costs.

2.) Physical asset specificity

- Production requires physically specialized components and equipment. However, market procurement is an alternative, if the assets are mobile.

3) Human asset specificity

- Any condition that gives rise to substantial human asset specificity, for example through learning by doing and social complexity.

4.) Brand name capital

5.) Dedicated assets

- Discrete investments in a general purpose plant.

6.) Temporal specificity

- Is caused by technological inseparability. This can be thought of as a mix of site and human asset specificity.

(Williamson 1985, pp. 95–96; see Williamson 1991, pp. 281–282)

Opportunism can be defined as the decision-makers tendency to seek their self-interest and the problem of knowing a priori who is trustworthy and who is not (Barney 1990). Williamson (1985, p. 47; see Rindfleisch & Heide 1997, p. 31) defines opportunism as self-interest seeking with guile. This definition includes lying, cheating and other forms of deceit such as violating agreements. The presence of specific assets exposes the investing party to opportunistic behavior from the exchange partner (Heide & John 1988, p. 23).

Safeguarding transaction specific assets can be done through different forms of vertical integration, which helps to (1) monitor and survey, (2) build better reward structures and (3) reduce the ability of the exchange party to profit from opportunistic behavior (Heide & John 1988, p. 22).

The frequency of transaction affects most the fixed costs of organizing non-market transaction. The more often transaction takes place, the more widely spread are the costs of establishing a governance system. (Holmström & Roberts 1998, p. 77)

Table 7 describes how different levels of asset specificity and frequency affect the firm's boundary choices. Activities with lower specificity can be outsourced, because there is not much information to be exchanged and an outside supplier can bundle demand and exploit economies of scale (Arnold 2000). Occasional and recurrent nonspecific transactions do not require any kind of vertical integration, so market governance can be favored. Continuity is not preferred, because both parties can easily arrange new trading relationships. However, Arnold (2000) claims that even low specificity assets

should be held within the firm, if they are strategically important.

**Table 7. The effect of frequency and asset specificity on transaction costs (Williamson 1991 & Williamson 1985, p. 73).**

		Investment Characteristics		
		Nonspecific	Mixed	Idiosyncratic
<b>Frequency</b>	Occasional	Purchasing Standard Equipment  <i>Market Governance</i>	<i>Trilateral Governance</i>  Purchasing Customized Equipment  Constructing a Plant	
	Recurrent	Purchasing Standard Material	<i>Bilateral Governance</i>  Purchasing Customized Material	<i>Unified Governance</i>  Site-Specific Transfer of Intermediate Product across Successive Stages

In occasional investments in mixed or idiosyncratic assets some kind of an intermediate institutional form is needed, because there are strong incentives to see the contract through to completion, but setup costs for the transaction specific governance mode are too high to be recovered through occasional transactions. The case of recurrent mixed asset specificity is not very clear. Basically the frequency of transactions and high asset specificity support the choice for vertical integration. However, in mixed asset specificity transactions there may be some scale benefits, strong market incentives and bureaucracy cost avoidance, which can be exploited through contracting. Vertical integra-

tion should be clearly favored for idiosyncratic recurrent transactions, because then the assets are less transferable and economies of scale can be as fully realized by the buyer as by an outside supplier. Walker (1988) suggests that the internal governance mode is selected when internal scale economies match those of an outside supplier. Increasing asset specificity erodes the aggregation economies of outside supply (Williamson 1985, p. 92; Walker 1988, p. 65). Vertical integration enables price, quantity and quality adaptations to be made without interfirm negotiations and agreements, and adjustments can be made to maximize the joint gain from the transaction. It also warrants joint profit maximization, because a single ownership spans both sides of the transaction. (Williamson 1985, pp. 72–80, 92; 1990)

### **3.3 Transaction cost economics and boundary choices of a firm**

Increasing transaction costs drive a firm towards choosing internal production instead of outsourcing and disassembling vertical integration. According to transaction cost economics, vertical integration is a tool to economize transaction costs (Williamson 1985, pp. 85–86).

In general, vertical integration is the combination of technologically distinct activities and economic processes between the company, suppliers, distribution channels and customers. It can be viewed as a decision made by the firm between market transactions and administrative transactions. At least in theory, all the activities the firm is performing could be performed by a consortium of independent economic entities, each contracting with a central coordinator. However, usually firms produce a great share of processes internally rather than externally, because they try to exploit some advantages that are believed to exist in internal production. (Porter 1980, pp. 300–301) Grossman

and Hart (1986) define vertical integration in terms of ownership and power to exercise control of assets.

Vertical financial ownership only makes sense when assets are idiosyncratic (Mahoney 1992, p. 575). It has been pointed out that internal vertical integration can be imitated by contractual agreements, such as long-term contracts and administrative procurements (see Heide & John 1988, p. 22). In the absence of transaction costs, vertical contracting can wholly replicate the advantages of vertical financial ownership (Mahoney 1992, p. 560).

### **3.3.1 Benefits and costs of vertical integration**

Customers' and suppliers' significant bargaining power increases advantages that can be attained through vertical integration. Vertical integration helps a firm to get supply at a lower cost, to raise prize realization and to offset costs related to otherwise valueless practices used to cope with powerful suppliers or customers. (Porter 1980, p. 307) A lack of asset specificity, diseconomies in scale and scope and possible gains from outsiders can be seen as limits to integration (Conner 1991, p. 141).

Vertical integration may function as an entry barrier if there are cost advantages that can be exploited by an incumbent firm. It is even possible that integrated firms can prevent nonintegrated competitors from getting certain intermediate products at any price. Vertical integration may give some scope benefits if there are technological inseparabilities. It enables a firm to avoid transaction costs and to gain from administrative control over resources. (Balakrishnan & Wernerfelt 1986; Mahoney 1992) Teece (1996, pp. 204–205) argues that there may be some interdependencies between vertical integration and the rate and direction of innovation. It has been suggested that verti-

cal integration enhances innovation and increases causal ambiguity, which leads to higher barriers of imitation (Reed & DeFillippi 1990, p. 99).

Some studies have found that vertical financial ownership reduces risks and uncertainty measured by beta in the capital asset pricing model. However, in the pulp and paper industry it has been discovered that vertical financial ownership increases systematic risk and the risk of bankruptcy. (See Mahoney 1992, p. 562)

It is typical of hierarchical, vertically integrated firms that they have a bureaucratic nature, internal focus, and absence of high power incentives and change culture. These characteristics make decision-making and reaction to changes in the external environment slow. (Teece 1996, p. 211)

### **3.3.2 Benefits and costs of using markets**

Outsourcing means transferring some internal activity to an external producer regardless of whether the activity is old or new. Firstly internal activity is *substituted* by buying from an external supplier. In this view outsourcing can be seen as a discontinuation of an internal activity. Secondly the decision is based on *abstention* from producing internally, even though it could be possible. Briefly, outsourcing could be considered as disassembling vertical integration. (Gilley & Rasheed 2000, p. 764; Nurminen 2001, p. 19; Pajarinen 2001, p. 6)

Traditionally, outsourcing has been used to get cost benefits or improved quality in the following ways:

- Outsourcing helps to concentrate on core competencies, which helps to create competitive advantage. Also, the firm may gain some cost



savings after internal support functions have been disabled.

- With outsourcing the firm can exploit economies of scale and the know-how of a specialized producer.
- Outsourcing results in improved quality and service.
- External producers are more efficient and market oriented in non-core functions.
- Internally produced non-core functions increase training needs.
- Increasing demand for flexibility pushes for concentrating on production, not on support activities.
- Companies are outsourcing, because they want to reduce dependency on human resources and to switch the cost structure from fixed to variable.
- Outsourcing results in improved flexibility.
- Outsourcing enables the firm to develop new skills, capabilities, knowledge and competencies.

(Gilley & Rasheed 2000, pp. 765–766; Espino-Rodriguez & Padron-Robaina 2004; Pajarinen 2001, p. 17; see Sartorius & Kirsten 2005, p. 83; Baden-Fuller et al. 2000)

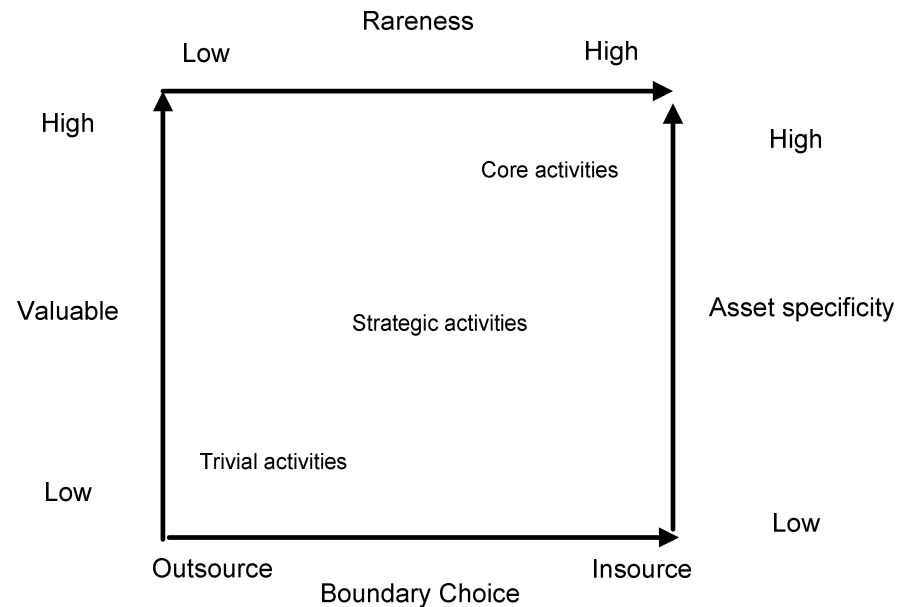
The benefits are born out of specialization: firms are specializing in activities, in which they have competitive advantage over their rivals. The purpose of strategic outsourcing is to combine the market incentives, efficiency of hierarchical production systems and flexibility between linkages over firms in a way that risks and pressure is transferred from the network's core companies to subcontractors. (Pajarinen 2001, p.21) Benefits will not come by itself, but the accomplishment depends on the firm's position and competences. The firm can pursue to improve its competitive advantage inside its value chain's boundaries by controlling linkages to suppliers. The benefits rising from coordinating and optimizing the linkages in the value chain highly depend on the firm's negotiating position, which is determined by the firm's structure and

purchasing behavior. However, the results arising from coordinating and optimizing value chain linkages can benefit both parties. (Porter 1988, pp. 70–71)

Outsourcing contains some risks. Blinded by short-term cost advantages, the firm may outsource some core activities which are crucial for the firm's competitive advantage and know-how (Pajarinen 2001, p. 18 and p. 21). The decisions concerning the efficiency of the firm's operations cannot only be based on minimizing costs of business operations, but there has to be consideration of changes in the organization's structure affecting innovation and accumulation of knowledge (Pajarinen 2001, p. 10). In addition, cost benefits are often overestimated, because it is hard to evaluate transaction costs. It is even possible that redividing of overheads will get efficient activities to look worse than they really are, perhaps leading to an outsourcing spiral. (Gilley & Rasheed 2000, pp. 766–767)

### **3.3.3 The combined effect of value creation and asset specificity**

Figure 3 creates a view of how asset specificity, rareness and value creation affect boundary decisions. In conclusion with what was discussed previously in Chapter 2, asset specificity and rareness can be connected with each other, and according to the resource-based view, valuable activities are usually tied to specific assets. Core activities were determined as high in value and asset specificity. Trivial activities may create value, but are not idiosyncratic assets. So-called strategic activities are a mix of core and trivial activities. As we can see from the figure high asset specificity, value and rareness drive towards using the internal production form.



**Figure 3. Value creation, asset specificity, rareness and boundary choice.**

Blomqvist et al. (2002) argue that vertical integration is a preferred choice when uncertainty, the danger of opportunism, complexity and asset specificity are high, there are only few providers of complementary capabilities and trust between partners is lacking. It can be concluded that increasing inimitability and non-substitutability escalates the asset specificity problem, because these conditions erode all market supply. All this drives towards choosing the internal production structure in core competencies.

Figure 4 sums up the benefits of different governance structures according to transaction cost economics. Partnerships can be considered as hybrid forms of governance, and when working well they can combine almost all the benefits attainable from using the markets and hierarchy.



**Figure 4. Benefits provided with different governance structures (Blomqvist et al. 2002).**

## **4 EMPIRICAL ANALYSIS ON BOUNDARY CHOICES IN THE PULP AND PAPER INDUSTRY**

The main purpose of this chapter is to create a view of the value chain of the Finnish pulp and paper industry and a paper mill integrate. The focus is on the integrate level. First, a brief look will be taken at the value chain of the pulp and paper industry and the firms analyzed in the study will be positioned on the value chain. Then the focus will be on the structure, resources and activities of the mill integrate. The main goal is to rationalize activities through a theoretical framework. The end of this chapter will present the boundary choices of the firms studied.

### **4.1 Data Collection**

The material for this part is based on eight interviews made in six different mills, which all can be described as modern and large. All interviews were conducted in December and January 2007. The mills were owned by four different international firms (named 1, 2, 3 and 4). All, except one German mill, are located in different parts of Finland. Mills B, C, and D are under same direct financial ownership (2) and the group also owns a major share of Firm 4. Tables 8 and 9 below describe some details of the interviews and mills.

**Table 8. Interviews.**

<b>Interviewee</b>	<b>Mill</b>	<b>Position</b>	<b>Place</b>	<b>Duration</b>	<b>Remarks</b>
1.	A.	Vice president of strategy	Conference room	1 h 9min	Two inter- viewers
2.	A.	Business unit manager	Office	1 h 41min	Two inter- viewers
3.	A.	Former Business unit manager	Conference room	1 h 44min	
4.	B.	General manager	Office	1 h 28min	
5.	C.	General manager	Conference room	1 h 28min	Two inter- viewers
6.	D.	General manager	Conference room	1h 13min	Two inter- viewers
7.	E.	General manager	Telephone	1h 24min	Two inter- viewers
8.	F.	General manager, HR manager	Conference room	1h 18min	Two inter- viewers, one disruption

As we can see from Table 9, Mills A, B, C and D function as traditional pulp and paper integrates. In Mill C, pulp and paper mills are separate firms, but the pulp mill is owned by Firm 4 and so the paper company owns a major share of its business. Mills C and D use mechanical pulp as the main source of fiber and this is the main explanation why Mill C is only partially integrated with a chemical pulp mill and Mill D is not at all integrated with a chemical pulp mill. However, Mill D acquires its required chemical pulp mainly from the pulp producers at least partially under the same financial ownership. Mill E produces its pulp from recycled fiber. Mill F is specialized in chemical pulp. The interviews were based on figures 5 and 6.

**Table 9. Some details of the participated mills.**

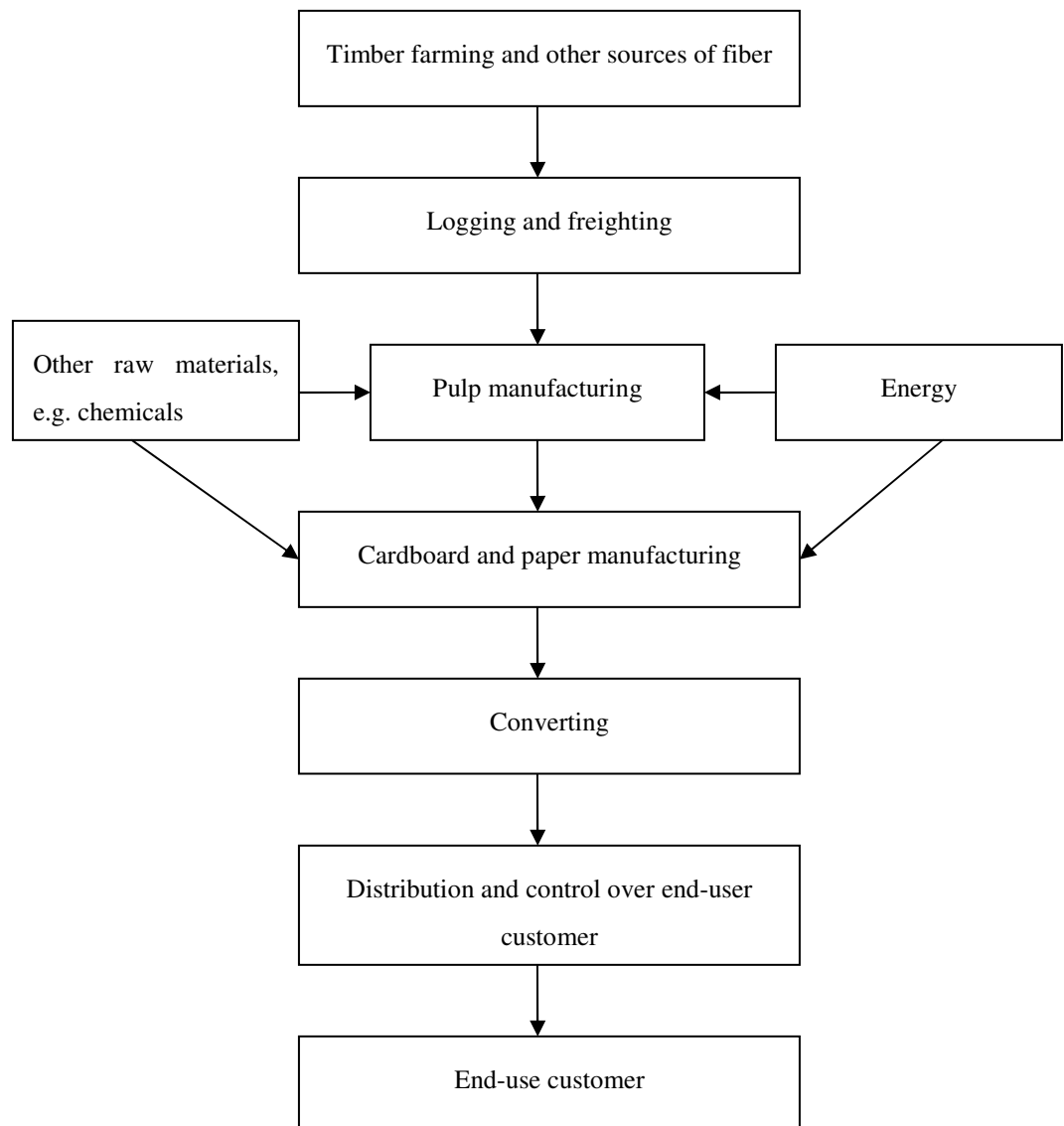
<b>Mill (Firm)</b>	<b>Pulp</b>	<b>Fiber source</b>	<b>Paper or cardboard</b>	<b>Product placement</b>
<b>A. (1)</b>	Yes	Wood	Yes	High value adding
<b>B. (2)</b>	Yes	Wood	Yes	Bulk/Intermediate
<b>C. (2)</b>	Yes	Wood	Yes	Bulk/Intermediate
<b>D. (2)</b>	Yes	Wood	Yes	Bulk/Intermediate
<b>E. (3)</b>	Yes	Recycled	Yes	Bulk
<b>F. (4)</b>	Yes	Wood	No	High value adding

## **4.2 Value chain in the Finnish pulp and paper industry**

One distinctive feature in the Finnish pulp and paper industry is that the firms are usually deeply vertically integrated, so that energy and raw material sources, pulp production, paper production, some upgrading stages of production and all support functions and activities are done by a same firm and even in a same geographical location. On the industry level, disassembling of vertical integration has already begun in the upstream of the value chain, but so far there have not been any crucial changes. In future it is very likely that the companies will integrate more into downstream business. The structure of the Finnish pulp and paper industry was reformed in the 1990s, when there were considerable consolidation activities. Consolidations enabled Stora Enso and UPM to become big world-class players in the pulp and paper industry. However, there were no considerable restructures in the vertical value chain; firms just grew larger.

Figure 5 shows the value chain of the pulp and paper industry. The value

chain starts from forests and after several stages it reaches the end-use customer. All the firms that are included in this study are positioned differently in the value chain. However, there are some common features. None of the firms produces chemicals and paper manufacturers usually stop their activities in paper and cardboard manufacturing stages.



**Figure 5. Value chain of the pulp and paper industry. (Adapted and modified from Shank & Govindarajan 1992.)**



Only Firm 2 has direct ownership in forests, even though they buy most of their required wood from the open market. Firm 1 has sold away its forests. However, it still exercises strong control over forests by owning 41% of a forestry company. Ownership over forest assets was explained by the need to level unbalanced situations in demand and supply of wood. Two interviewees from Firm 2 emphasized the fact that in high wood price situations logging could be directed to own forests. One interviewee even considered wood as a scarce resource. However, three out of four whom this was asked considered that wood markets work quite well. Firm 4 does not own forests, but a great share of the company is owned by forest owners. Seven interviewees considered important to locate pulp production near the supply of fiber (wood or recycled). Transportation of wood was not considered efficient over distances of 100–200 km in normal conditions, which more or less erodes the functionality of the markets.

*“... wood have to be scraped up from close quarters... wood can be transported efficiently only from certain range and it is already expensive...we have to make sure that wood from this our nearby area comes to us...”*

*“In certain situations we can direct some logging to our own forests... if we have arguments on pricing...”*

*“I would not consider them working very well. There are only 2–3 buyers and MTK is controlling the price on the other side.”*

The decision to sell energy plants was criticized in all three interviews conducted in Firm 1. Firm 2 has chosen a different kind of strategy and not sold its energy assets. Ownership of sources of energy was deemed very important in order to keep at least some possibility to affect energy production and prices in the future. After all, the paper industry is one of the largest consum-

ers of energy in Finland. However, energy is one major by-product of chemical pulp manufacturing and it enables pulp–paper integrates to be almost self-sufficient in energy. Firm 3 buys all of its energy from an external power plant. Firm 4 does not own energy plants, but it is practically self-sufficient, because energy is one of the by-products of its core production activity.

Chemicals are an essential component in pulp and paper manufacturing, and their price volatility can cause big changes in production costs. One of the interviewees pointed out that in the magazine segment different kind of pigments can form up to 20–30% of the paper's composition. Two interviewees had experienced pricing problems with producers, which, in some cases, have led to changing the producer. Switching costs were considered low or almost nonexistent, except in gas products where producers own all necessary equipment. Nevertheless, all firms procure the required chemicals from the open market. However, the chemicals market was found to be working well, but there has been some concentration activity between producers. Interviewees considered chemical production distant from their own core business, which drives towards using the open markets.

*“No, we don't want to produce them [chemicals], it is not our thing...”*

The pulp market was considered to function very well and the number of producers is quite good. However, all the firms have a strategy to be self-sufficient in pulp, mainly because of high price volatility. One interviewee even considered the effects of using market pulp catastrophic for the profitability of the business. Ownership over pulp production was emphasized by one manager, who stated that ownership enables pricing to be based on production costs, not on pulp's market prices. The manager considered price stability important to their customers. Mills C and D were the only mills in the study using market pulp, but its share was only minor in the whole consump-

tion of pulp. Also, it has to be noticed, that Mills C and D usually use pulp producers that are at least partially owned by the parent company.

*“Investments are so large, so it is worth taking a risk with volatility on pulp...”*

*“Pulp is a key material in paper making, its availability, its controllability...”*

All the firms engaged in paper manufacturing, except Firm 4, which produces only pulp. Converting operations by paper manufacturers were usually stopped after pigmenting and rolling. At this stage of the value chain the operations were devolved to firms in upstream business.

Vertical integration was mostly explained by a need to exercise control over assets in upstream business. Ownership over wood, pulp and energy sources was based on the ability to affect the supply of assets. Supply itself was usually not deemed problematic, but there seemed to be situations where firms wanted to level prices by increasing the supply. General managers from Firm 2 confirmed that when the market price goes high enough, own wood sources are taken into use. There were some concerns that firms are dependent on Russian wood, especially on birch, but there is not very much that firms can do about the situation.

Ownership in forest assets helps to operate in extreme conditions, which was proven in this fall and winter, when weather conditions did not allow logging to be performed as usual. This was pointed out by one of the general managers of Firm 2, who also noted that there are some know-how and development issues involved in forest owning decisions.

*“We have ran into some sparseness... raw materials... energy... at least the price is uncontrollable...we have to have a reasonable share of the compo-*

*nents required in paper making in our own hands.”*

**Table 10. How firms have positioned themselves into the value chain of the pulp and paper industry.**

	<b>1.</b>	<b>2.</b>	<b>3.</b>	<b>4.</b>
<b>Timber farming</b>	Major ownership in forestry company	Direct ownership in about 10% of required assets	No	No
<b>Logging and freighting</b>	No	No	No	No
<b>Pulp manufacturing</b>	Yes	Yes	Yes	Yes
<b>Energy (Primary/by-product)</b>	No/Yes	Yes/Yes	No/No	No/Yes
<b>Chemicals</b>	No	No	No	No
<b>Paper manufacturing</b>	Yes	Yes	Yes	No
<b>Converting</b>	Yes	Yes	No	No
<b>Distribution and control over end user customer</b>	No	No	No	No

### 4.3 Activities in a typical Finnish pulp and paper mill

Scale advantages are typical of mature industries, such as the paper industry, which can be seen in productivity, efficiency and gross income. Scale advantages are attained through heavy investments in plants, machinery, and production technology and by a concentration process. (Lamberg et al. 2006, pp. 12–14) A typical Finnish firm in the pulp and paper industry is going towards ever bigger production plants and units in order to exploit economies of scale and scope. Nowadays there still are many small pulp and paper mills, but in the future it is highly likely that they will disappear because of their cost disadvantage. These claims found support in the interviews.

The products of the Finnish paper industry are usually in the high value added segment. In some interviews it was mentioned that finer paper grades require more sophisticated pulp grades, which drives mills into integrates because of higher asset specificity. It was also noticed that in regions where firms are highly concentrated, mill integrating is more common. (See Ohanian 1994) The claim about Finnish paper mills producing high value added products is somewhat questionable, because three out of four of our Finland located paper mills positioned themselves near the bulk product segment.

There are also notable cost advantages in integrates, because pulp does not have to be dried, paled and then disintegrated before use. In an integrate, pulp can be transferred directly from the pulping process to paper machines. In sum, performing all necessary activities in an integrated mill may clearly offer some advantages, but they do not have to be under same financial ownership, which brings us to the foundations of this study. Moreover, in the interviews it was commonly mentioned that it is much more economical to transport pulp than wood or paper. This may lead to a condition where it is

more efficient to locate the pulp mill near raw material sources and the paper mill near the customer base. In the newsprint segment, a paper mill must be located near the customer base and the sources of recycled fiber, usually in densely populated areas.

In the interviews the activities were found to be basically the same in all the mills which were used in the study. The activities could be easily structured into main activities and support activities. All the interviewees considered the activities in their core production process as their main or core activities. This included the production of pulp and paper, coordinating the process and sales.

Figure 6 describes what kinds of activities are needed in a pulp and paper mill and how they are organized. The figure is loosely based on Porter's value chain, but it is heavily modified to fit the pulp and paper industry. This is the second one of the figures on which the discussions in the interviews were based. Main activities are located in the center of the picture, and they consist of procurement, production and sales activities. Support activities are located both on top of the main activities and below them. Financial administration, human resource management, human infrastructure services and information systems are common support activities employed and shared by all other activities of the firm. Based on findings made in the interviews, a conclusion could be drawn that Figure 6 quite adequately describes activities in a pulp and paper mill.

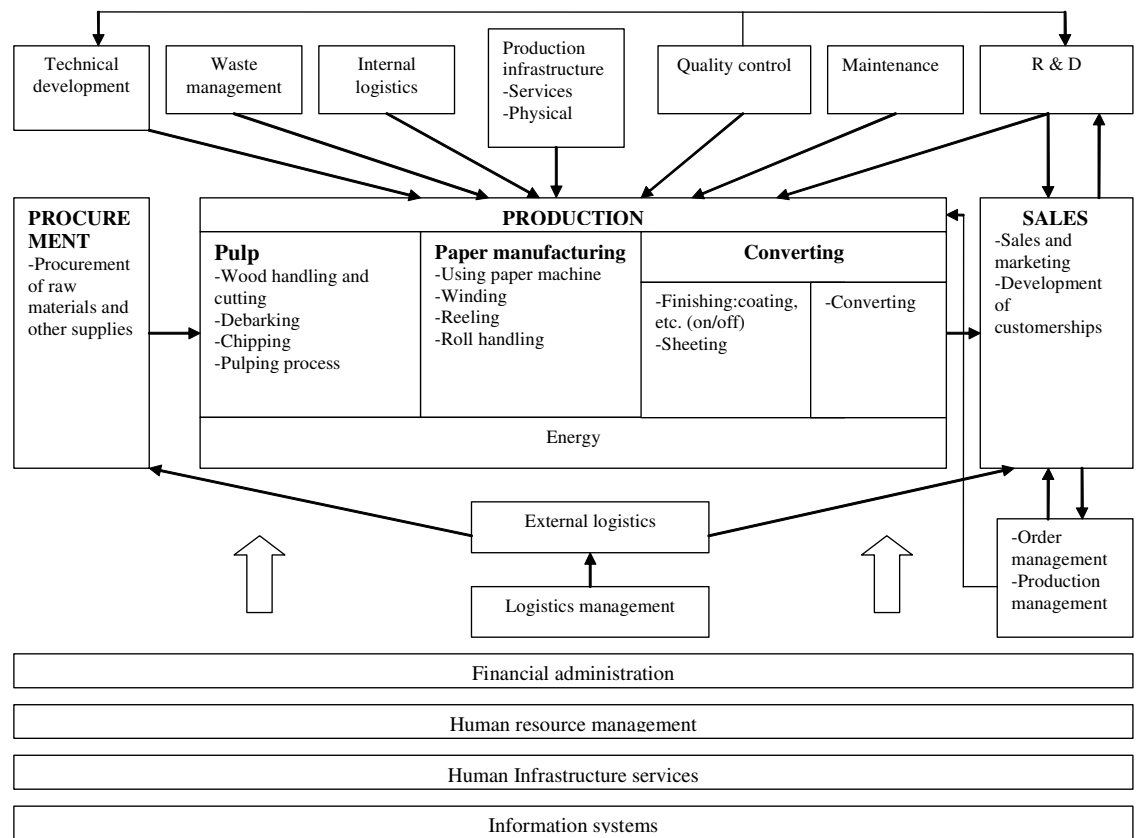


Figure 6. Activities in a pulp and paper mill.

#### 4.4 Activities against the resource-based view

The pulp and paper industry is classified as a very capital intense industry. The view was supported by the interviewees. Running a modern pulp or paper mill requires heavy investments in physical resources such as machinery and infrastructure. Most of the physical resources were committed to the core production process itself. Most of the capital is invested in pulp mill and paper machines and this was confirmed by all five interviewees with whom this question was discussed. It was noted that a new large pulp mill will cost as much as one billion euros. The prices of new paper machines were found to be somewhere around €300–500 million a piece. Mills A, B, C and D all had

at least two paper machines, so ultimately, it will cost over two billion euros to build an integrated pulp and paper mill, which is large enough to function efficiently. In this view it is interesting to find out that Mill E has only one paper machine, but we have to remember that Mill E is working in a slightly different way than the other mills.

It is not only physical resources that make up the production. All the eight interviewees emphasized the importance of skillful employees. It was noted that production is a combination of technology and human skills. One rough estimate was that 30% of the product is done by machinery and the rest by human assets. The ability and motivation to develop continually was deemed important in a challenge to face future competition.

The resource-based view is largely based on finding those resources or activities that can be considered valuable, rare, inimitable and non-substitutable. In theory, resources that fulfill all these attributes are the source of sustainable competitive advantage. These activities are the ones that should be held within the firm in all conditions. This part of the study was deeply based on characterizing activities in a pulp and paper mill through this context in order to use the resource-based view to explain the boundaries of a firm in the pulp and paper industry.

#### **4.4.1 Valuable activities**

All the interviewees considered main production processes as their valuable activities. These consisted of procurement, pulp manufacturing, paper manufacturing and sales. Value creation was estimated to be on its height at a pulp mill or at a paper machine depending on the answer. One interviewee stated that with current pulp and energy prices, the pulp unit in Mill A is probably the



most profitable business unit in the whole firm. Pulp mill and paper machine can be described as highly complementary and they have some cost benefits in production when functioning in an integrate compared to using pulp produced in another plant. In Mill A good communication and fast reactions between pulp and paper production were considered important and the source of competitive advantage. However, in other mills managers did not see any communication or other problems in buying pulp from an external source. The sales activity can be considered as one part of the core production process.

It is interesting to notice that even though paper firms think that they own valuable activities in the industry's value chain, they are in the middle of a crisis. All the interviewees pointed out that the problems arise from past contracts with the labor union, which has led to a condition where there are too many employees and they get paid too much. Some of the managers estimated that as many as 35% of the employees can be let go without any effects on profitability, and in some cases it had already been done. This condition combined with an overcapacity situation in the industry, which has led to a decrease in real prices, have caused profitability in paper making to shrink.

*“Overcapacity that is our own fault. We haven't taken care of costs... we've had to hire too many employees... the absolute price and number of employees...”*

All other activities which have a direct impact on the quality and efficiency of the main process were considered strategically important in Firms 1 and 2 and highly complementary with the core production process. This view was different from Firms 3 and 4 which only deemed the core process as valuable and the source of competitive advantage. Maintenance, technological development, quality control and research & development were considered to have a direct impact on the efficiency and quality of production.

The maintenance activity works directly with production and they can be considered highly complementary, but only a share of the maintenance activities have a direct impact on the efficiency and quality of production, and those activities were deemed specific to the paper industry. In many interviews the role of maintenance was emphasized, and in some cases it was even considered as a fixed part of the core production process. One general manager emphasized the role of maintenance activities, when a plant should be running on a 24/7 basis.

Even though production activities are capital intensive, technology was not held as a decisive resource in competition. All the interviewees confirmed that there really is no way to gain superior performance with superior technology. There are only two equipment providers and the technology is available to all the competitors just by throwing in some money. In conclusion, the only way to attain competitive advantage is through superior employees and their capabilities. It was noted that products are not made by machines, but by humans. Technology itself is quite durable, and it is not at all uncommon to use machines of over 30 years of age. However, to be efficient those machines require continuous development.

*“We have the know-how of doing things...the knowledge of using those machines...”*

Paper firms have, or at least they think so, the know-how to run machines and organize the production process efficiently. It was noted that even with exactly the same machines, there are differences in the performance of running the machines. Firms have some competence to modify machines themselves without the help of equipment providers, but eventually technological innovations will still leak to competitors. The only way to attain and keep up competitive advantage is the continuous development of employees. One important

capability which was recognized important in the interviews was the ability to get employees to work as one team.

Three interviewees emphasized good reputation among customers as a valuable resource, and one noticed that, having lost a customer, it is hard to regain them. A business unit manager in Mill A pointed out that in their main product segment it takes some time for a new entrant to convince potential customers of the high quality of their products. A general manager in Mill D pointed out the fact that they have a brand and they have a continuous project to build it up. However, a manager from Mill F stated that the role of brands in the industry is quite small.

All industry specific parts are committed to the core production process and to activities directly related to it, such as specific maintenance activities, technological development, quality control and research & development. There are heavy specific sunk costs related to the production, and it forms a complementary system with the activities listed before. All the other activities are quite common, and producing them inside a pulp and paper firm does not give any advantage. However, some interviewees noted that the distant location of the Finnish paper mills prevents the opportunity to efficiently use service providers. Competitive advantage can be attained by managing and running this combination of technology and different human assets better than rivals. Six of the eight interviewees considered the main production process with specific support activities as valuable or strategic, and two only considered the core production process valuable. In sum, the combined system can be stated as valuable according to the theoretical framework. This does not mean that there are no other valuable activities in the paper industry, but a major share of the value is produced in the core production process with the help of highly complementary activities.

**Table 11. Valuable activities in the pulp and paper industry.**

<b>Valuable activities</b>	
<p style="text-align: center;"><b>Production activities</b></p> <ul style="list-style-type: none"> <li>- Procurement</li> <li>- Pulp manufacturing</li> <li>- Energy production</li> <li>- Paper or cardboard manufacturing</li> <li>- Converting operations</li> <li>- Sales</li> </ul>	<p style="text-align: center;"><b>Strategically important support activities</b></p> <ul style="list-style-type: none"> <li>- Specific parts of maintenance</li> <li>- Research &amp; Development</li> <li>- Technological development</li> <li>- Quality control</li> </ul>

#### **4.4.2 Rare activities**

The technology in pulp and paper making cannot be considered rare, even though the core production process only contains a few industry specific parts. All the interviewees emphasized the fact that even the most modern production technology can be bought by anyone. At the moment there are only two technology providers in the paper industry, so certainly no competition dynamics affect the market. The situation can be named a duopoly. In conclusion, technological development can be described as valuable and rare, but firms do not have sufficient capabilities to make them on their own. Firms can make, and they do make, only minor modifications to the machinery, with which they try to gain some advantages in quality and efficiency. What comes to non-industry specific parts, the supply cannot be considered rare and there are many specialized providers, for example in pumps and axels.

*“Everything what comes to the technology and machines...it is tradable...Anyone can buy similar machines...”*

*“Benefits are attained by how the machines are used...”*

The ability to run and control the production process efficiently can be called a rare resource to some extent. Especially engineering and management skills were deemed important. Learning by doing was recognized an important factor in developing employee skills, so it is not always possible to suddenly switch employees. There are some firms that are providing service to run machines, but all firms in this study say that they have some special skills in the production process which makes them more efficient than for example Metso.

Support activities are not only paper industry specific and usually it is possible to buy them from the market. In this light support activities cannot be considered as rare.

#### **4.4.3 Considerations on inimitability and substitutability**

*“These products are not so high tech, that there wouldn't be anyone else that could make these...”*

The paper industry demands heavy specific capital investments to be made before production can be started, so there is a remarkable danger of sunk costs involved. As discussed before, a paper machine costs about €500–650 million, and a pulp mill with a capacity of nearly million tonnes a year costs about €1 billion. However, even though paper production requires heavy investments there is overcapacity in the industry, which makes it questionable that there would be any significant entry barriers of heavy investment requirements.

Only in Mill A managers considered that, because of their specialized high value added product segment, which has limited market potential, they are protected by heavy investment requirements. The product of Mill A requires special pulp grades to be used, and the producer's reputation among customers is deemed an important factor. There are too many risks in their segment to be attractive to potential rivals.

The technology is available to all pulp and paper manufacturers, so building sustainable competitive advantage around machinery is doomed to failure. It is not about machines, but how a firm as persons and an organization acts and uses those machines. This was stated by all the interviewees.

Building sufficient capabilities to run production efficiently will take years. One estimate was as long as over 10 years when starting without assistance. However, capabilities can be transferred by professional employees. According to recent experiences, in Firm 2 it takes only two years with the help of experts to efficiently run a new plant. In conclusion, crucial human assets can be bought. Still there were doubts about how well know-how can be transferred between business units and between different firms. Firms 1 and 2 had experienced problems in transferring best practices between different plants inside the firm. In many cases it was pointed out that in every mill machines and other factors of production are different and practices cannot be transferred directly between mills. Many managers stated that all machines are different and every plant needs specific production recipes.

*"We've learned to make these products just out of these local trees, chemicals and water... it [process] is so specific to these raw materials...they are always different..."*

*"It's not easy to transfer success from one mill to another..."*

The importance of culture, which guides employees' thinking, was recognized by a couple of interviewees. It was deemed important that employees working in three different shifts do things in the same way, because it is the only way to ensure the level of quality in the production. The general manager of Mill D emphasized that it is almost impossible to transfer cultures from one company to another. Managers from Firm 1 stated that it is important to commit employees to the firm and get them to act in a way that benefits the firm. Managers of Firm 1 also deemed the ability to make the whole production process work with synchronization crucial, and this capability rises from experience with running the production.

#### **4.5 Activities against transaction cost economics**

In the interviews there were notable transaction costs observed among the activities. Transaction costs were mainly related to asset specificity and behavioral uncertainty.

Management costs were deemed an important determinant in outsourcing decisions in many support activities, especially in activities with cyclical nature. The interviewees considered important that activities should have a steady 100% workload all the time in order to be efficient and keep up and improve know-how. Almost all the interviewees considered that incentives are not working very well. In contrast, many of them still stated that at times even small rewards can be attractive to employees.

### 4.5.1 Specific activities

As has already been discussed in previous chapters, the most industry specific resources and activities are located in the core production process in the pulp and paper sector. There is some specificity in highly complementary activities, but it is mainly related to the core production process. Based on findings made in the interviews, support activities generally cannot be deemed specific in any way.

*“In principle, anything can be outsourced...”*

Pulp and paper making requires special technology, but not all the components in the machinery can be held as specific to pulp and paper making. One estimate was that about 80% of the components are common to other industries. Some paper industry specified components, such as process computers, blades, scanners, rollers and winders were listed in the interviews. However, it was interesting to find that supply and maintenance in many specific components were outsourced. In Mill F the interviewee stated that machines are composed of different components quite common to all machining. However, some key components and component compositions are held by technology manufactures and protected by patents and it is almost impossible to bypass original equipment manufacturers. At the moment there are only two paper machine manufacturers, so there is a great threat of opportunism. However, machine manufacturers are dependent on some of their component suppliers, which gives some options to pulp and paper firms.

Frequency in investing in new technology is very low which decreases the potential of asset specificity and hold-up problems. However, developing and maintaining machinery is a continuous process, and to some extent pulp and paper firms are dependent on original equipment manufacturers. Four inter-



viewees in Firms 1 and 2 had already experienced some hold-up problems with technology manufacturers. In Mill A the manager of a business unit was concerned about price increases in services and spare parts. Whereas, managers in Firm 2 complained that price elasticity in the manufacturing technology is quite low.

A major hold-up problem was recognized in running the pulp and paper making process, because of heavy capital investments required by the production process. All the interviewees considered hazardous to outsource personnel from core production activities. Outsourcing would lead to erosion of know-how, and the owner of the equipment would be threatened by opportunism. Employees are not fully interchangeable and they cannot be bought from the market just like that. One manager considered it a risky business. Another manager even had some doubts that they would not even have the capabilities to supervise production, if they completely lost the know-how.

Six managers also had some concerns about asset specificity and opportunism in maintenance activities. Mill E, which had outsourced its maintenance activities to the original equipment manufacturer, deemed very hard to change its supplier anymore. Switching costs related to training, learning and possible losses in know-how were feared to be too high. Some maintenance activities are specialized to certain machines and performing those activities may have direct consequences on production. One estimate was that nearly five percent of efficiency could be lost, if the know-how in maintenance eroded. A manager from Mill E considered that the maintenance staff has to be pretty attached to the plant; otherwise there will be the threat of losing know-how.

In Firm 1 there were some thoughts about site asset specificity between pulp and paper production. First of all, as explained before, there are some trans-

action cost savings, because pulp can be transferred through pipe. Cost savings were estimated to be a few dozen of euros per one tonne of pulp. Secondly, changing the pulp involves some changes in paper machines. One manager estimated that two hours' production will be lost. In contrast, one general manager in Firm 2 did not see any problems using market pulp, and the other even stated that changing the pulp should not have any serious defects or delays in production.

The asset specificity problem in the pulp and paper industry is hard to categorize into any single category listed in Chapter 3.2. It is sure that the problem arises from specialized equipment and staff, and so the problem can be associated with site, human, physical or dedicated asset specificity categories. Clearly there is some site specificity with raw material sources and pulp and paper production. However, site asset specificity in the pulp and paper industry does not prevent a pulp mill from selling their services in the open market or from using other pulp sources. From this perspective it can be stated that site asset specificity does not create any significant hold-up problems between the pulp and the paper mill. When we take into consideration the fact that transportation of wood is costly, it may lead to a situation where the pulp mill is dependent on its nearby wood sources. According to what was found about activities and the resource-based view, human asset specificity can be considered a dominating aspect. It is very hard to change staff; because all mills are different, there may be some significant switching costs involved.

#### **4.5.2 Uncertainty and activities in a mill**

In core and strategic activities costs related to environmental and behavioral uncertainty existed but were overshadowed by the asset specificity problem. However, one manager state that after the phase in which wood is brought

into the process, contracting and measurement costs increase so much, that it is highly improbable that outsourcing would give any advantages. Another general manager even stated that measuring the production would require almost as much staff as to run it by themselves. Outsourcing the sales staff was not considered worthwhile because of behavioral uncertainty.

*“It could be that a subcontractor feeds logs to the barking, but after that negotiating becomes quite difficult.”*

In trivial support activities, uncertainty was the primary source of transaction costs. It was stated that it usually is easier to produce activities internally, because outsourcing requires different capabilities to understand and measure and it contains some risks of losing control over the activity. One statement was that searching, planning and contracting will take one year before activity can be outsourced, after which assessing the supplier and the supplier market must be a continuous process. Assessing a supplier requires specialized staff to be held within the firm, for example engineers or construction managers, so measuring really involves costs. Two interviewees from Mill A also considered communication problems a major dilemma in outsourcing.

Two interviewees from Firm 1 and one from Firm 2 were concerned with goal congruence between the principal and the supplier. One manager from Mill A considered that there will be problems between them and their partners, because both want to maximize their own profits. He said it may cause problems with their quality, because the supplier wants to be as efficient as possible. In contrast, Firm 3 did not hold this as any problem. In their opinion goals for all the partners are the same: to satisfy the needs of customers.

Four interviewees from Mills A, B and E considered that outsourcing may have some undesired effects on employee motivation, and this effect must be

included into the transaction cost framework. Technological uncertainty was deemed to exist only in support activities, but this question was not really discussed in the interviews.

Volume uncertainty can be considered the main reason why firms have assets over wood, pulp and energy sources. By owning some of their raw material sources, they have the ability to affect prices by increasing supply if necessary.

#### **4.6 Boundaries of pulp and paper mills against a theoretical framework**

Table 12 creates a view of how activities in a mill can be divided into three major categories. The table is based on the interviews, and in some cases activities were open to various interpretations by the author. Interviewees were directly asked about the core activities, but in strategically important and trivial activities the categorization is based on interpretation. A strategically important activity was determined by a direct effect on efficiency or quality. The rest of the activities were held as trivial. As we can see from Table 12, core activities and strategic activities are in the production process or directly related to it. One general manager considered activities near “the tube” as their core. In conclusion, running and organizing the production process can be described as core competence in pulp and paper firms. All the interviewees stated that competitive advantage in the pulp and paper industry comes from core activities with some assistance from strategic activities.

Most support activities can be considered as trivial. Seven of the eight interviewees did not see any specificity attached to trivial support activities.

Table 12. Core, strategic and trivial activities in a pulp and paper mill.

<b>Activity</b>	<b>Core</b>	<b>Strategically important</b>	<b>Trivial</b>
<b>Production</b>			
Procurement	X		
Pulp manufacturing	X		
Paper manufacturing	X		
Converting	X		
Energy	X	X	
Sales	X		
<b>Support activities</b>			
Technological development		X	
Waste management			X
Internal logistics			X
Production infrastructure			X
Quality control		X	
Maintenance		X	X
R & D		X	
External logistics			X
Logistics management		X	X
Order and production management		X	
<b>Shared services</b>			
Financial administration			X
Human resource management			X
Human infrastructure services			X
Information systems			X

Table 13 presents how the activities of a pulp and paper mill are characterized from a theoretical background and draws some conclusions on boundary decisions.

**Table 13. VRIN and transaction cost attributes and activities.**

	<b>Core activities</b>	<b>Strategic activities</b>	<b>Trivial</b>
<b>Valuable</b>	Yes	Yes	No
<b>Rare</b>	Human assets to some extent	To some extent	No
<b>Inimitable</b>	Know-how can be transferred, 2 years	Know-how can be transferred, 2 years	High transferability
<b>Non-substitutable</b>	Threat of electronic media		
<b>Asset specificity</b>	Highly specific	Some parts are specific	No specificity
<b>Behavioral uncertainty</b>	High	High	Low
<b>Technological uncertainty</b>	Low	Low	High
<b>Conclusion</b>	Insource, build capabilities	Keep highly complementary and specific assets, rest can be outsourced	Outsource based on economical considerations

The interviewees stated that competitive advantage is attained through human assets. Core activities were considered valuable and they contained specific assets. The production process and some strategic activities are only activities that can be considered valuable, rare and inimitable. Behavioral uncertainty was also considered high in the production process. This all will lead to a condition where control of the production process should be held within the firm. Outsourcing these activities will erode a possible source of competitive advantage and expose a firm to opportunism.

The case with strategically important activities is not so clear. Evidently there are some activities in strategic support activities that fulfill the VRIN attributes of the resource-based view and have high transaction costs because of asset specificity and uncertainty, and they should be held inside the firm. Firms E and F stated that only the production process is their core competence and it is the only activity that they should do themselves. It is possible that through

outsourcing there may be some cost or competence benefits to be attained with strategically important activities.

According to the theoretical framework there are no reasons why trivial support activities should not be outsourced. They may be valuable to the firm, but they are not rare or inimitable. There are no reasons to produce them internally, and low transaction costs with trivial activities support this view. In support services there are not many industry specific activities or resources, and this was confirmed by all the interviewees. Firms cannot gain competitive advantage by producing these themselves, and by outsourcing they may gain cost, quality and flexibility advantages. However, we should not forget that outsourcing of these activities have to be based on technological and economic considerations, not on emotion. This was confirmed by seven interviewees.

All the interviewees considered that there is at least adequate market supply for all the activities. Seven interviewees also considered that in principle there are no obstacles to outsource everything, but in the long run it would not make any sense. In one case the distant location of the mill was considered an obstacle for outsourcing: it would take hours or even a day to get experts to do the required jobs, and this may lead to losses in production. In contrast, in Mill E a manager considered that their location enables experts to be on hand in a few hours.

#### **4.7 Boundary analysis of pulp and paper mills**

Boundaries were inspected on the mill level. Defining an outsourced activity was based on financial ownership and a right to exercise control over the activity. This section is based on findings made in the interviews and the ques-

tion was posed directly to the interviewees. Findings are not 100% accurate, because activities were studied in blocks and it is possible that interviewees did not remember to mention everything.

#### **4.7.1 Production activities**

In the production activities there were no major differences between the mills: almost all is done within the firm. However this finding is not surprising, because all the interviewees considered running and organizing the production process as their core competence. This is also supported by the view that the most valuable, rare and inimitable parts of the value chain are located in the core production process. The internal form of production is also supported by transaction cost economics, mainly because of high asset specificity. Keeping and developing the know-how of the production process was deemed extremely important by all the interviewees.

*“Our core competence is to manufacture pulp and paper...”*

*“Sales is not a separate function. It is an essential part of the production process and production management...”*

*“There is a risk of losing know-how. If we lost it, we couldn’t even monitor if our orders have been met... we couldn’t monitor how costs emerge...”*

None of the mills are self-sufficient in energy. Energy production in Table 14 is related to pulp production. In Mills B, C, D and E procurement is done externally, but still within the firm as a shared activity. In pulp production, Mill E uses recycled fiber. Mills C and D use mechanical fiber as their main source of pulp, and they produce it internally. Their requirements of chemical pulp



are met externally, but usually Firm 2 owns at least a share of their pulp suppliers. Mill C has formed an integrate with its supplier of chemical pulp. Main reasons for integrating pulp and paper manufacturing operations were costs as has before been discussed in this study. Only Firm 1 noted that there may be some communication benefits. In contrast, a manager from Mill D considered non-integration as a benefit, because it gives freedom to choose pulp producers.

*“Rapid feedback from an internal customer...in this sense the integrate is an excellent place to develop products...if we sold to an external customer, it might take as long as three months to get feedback...”*

**Table 14. Production activities and outsourcing.**

<b>Production</b>	<b>A.</b>	<b>B.</b>	<b>C.</b>	<b>D.</b>	<b>E.</b>	<b>F.</b>
Procurement	In	Shared/In	Shared/In	Shared/In	Shared/In	Out
Pulp manufacturing operations	In	In	In & out	In & out	N/A	In
Paper manufacturing operations	In	In	In	In	In	N/A
Converting	In	In	In	In/Out	N/A	N/A
Energy	In	In	Out	In	Out	In
Sales	In	In	In	In	In	In

#### **4.7.2 Support activities of production**

In the outsourcing support activities there were more differences between different mills than in the core activities. Differences can be mainly explained by different views that firms had on strategically important activities and what activities are potential for outsourcing. Mills E and F preferred to concentrate only on the core production process. Mills A, B, C and D also emphasized the

role of activities directly connected with the production process, and it raised a question if those activities can be handled apart from production. However, Mills E and F considered that they cannot create competitive advantage with activities that cannot be considered as their core competence. Seven interviewees stated that in principle all the support activities, except those that are deemed strategically important, can be outsourced if there are enough efficient producers in the supply side of the market.

Technological development was outsourced in every case. All the studied firms are dependent on original equipment manufacturers. Still, at least Firm 2 stated that they have some capabilities to do development work on their own. One manager in Firm 2 estimated that the development process is shared at a ratio of 30–70% in favor of the equipment manufacturers. All the firms admitted that they do not have sufficient capabilities to develop production technology on their own. It was considered very risky to try it. One manager even stated that risks for possible hold-ups are less than for trying to develop technology on their own. It was also noted that original equipment manufacturers can take advantage of all scale and scope benefits. At least Firm 1 has previously tried to make machinery themselves, but according to the interviews it did not turn out to be a success.

*“... Risks in developing machines are too high; it is higher than the risk of paying higher margins to equipment manufacturers...”*

*“Those machines are so expensive that we want to keep the know-how in the same package. And a guarantee, if the project fails...”*

Waste management can be considered trivial in pulp or paper making. It does not have any consequences on the efficiency or quality of the production process. The implication of this condition is clear: the activity is mainly out-

sourced.

Internal logistics can be considered trivial, but for some reason it has been outsourced only in half of the cases. One interviewee noted that the mill is not working properly if there is a need for internal logistics. Mill C has outsourced receiving, measuring and handling of wood. There has been similar plans in Mill F, but problems with asset specificity led them to keep the activity inside. In March Mill A stated publicly that they are planning to outsource some wood handling activities. This announcement caused protests from the labor union.

Production infrastructure services such as cleaning and maintenance of buildings was not held strategically significant, so there were not any know-how considerations. Outsourcing in these services was at least in its initial phases in each mill. Recently there has been a lot of talk about outsourcing cleaning services, and the labor union has been strongly against it. However, the process was already completed or on its way in each mill except Mill D. When cleaning was outsourced they reported 30–50% cost savings compared to producing it internally.

Quality control was held strategically important in all cases, and there were some complementary benefits with the core production process, because it helps to understand and develop processes. There were also some concerns that outsourcing the quality control activity would lead to losing the competitive advantage to competitors. Mill C has outsourced some laboratory activities. The decision was based on costs and potential know-how benefits attained from a specialized producer. However, Mill C has kept measuring activities directly connected with the process insourced. Whereas, Mill F procures some quality control from an external producer, if they do not have sufficient capabilities to do that on their own.

Organizing maintenance is one of the most interesting questions in this study. Firms 1 and 2 deemed maintenance strategically important, because it has a direct effect on efficiency and quality: it helps to develop the technology and processes, and know-how will be lost if it is outsourced. Insourcing decisions were based on desire to keep these valuable assets under own control in order to develop the production process and in fear of hold-up problems because of asset specificity. In contrast, Mills E and F have outsourced their maintenance activities, because they found no benefits from insourcing. Mills B, C and D have outsourced their maintenance activities that are not industry specific and classified as strategically important. Mill A has separated its service activities to a separate company, but it is not considered outsourcing by the definition of this study, because it is 100% owned by Firm 1 and also the interviewees only saw it as an administrative unit. The hold-up problem was recognized in Mill E, but they were still satisfied with their decision. A manager from Mill E however implied that there has not yet been any serious test as to how this arrangement of maintenance works. Mill F has some ownership in its maintenance company.

Of the maintenance activity 30–50% can be considered pulp and paper industry specific. Firm 2 has a strategy that these specific activities will be held inside. One manager estimated that about 30% will be kept inside, 20% will be outsourced to equipment manufacturers and the rest will be outsourced to specialized producers. The general manager from Mill C estimated that they have approximately 160–180 subcontractors working on maintenance. The outsourcing decision was based on a couple of facts: in some activities firms do not have sufficient capabilities, low frequency makes it costly to do it themselves and prevents the development of the activity, and in some cases it is regulated by law. A manager from Mill B stated that in non-specific activities there are notable cost and know-how issues that can be gained by outsourcing. It was noted that there is no sense to insource activities related to,

for example axels, pumps, electricity or construction works, because they are common to all industry branches. All mills have to use subcontractors in stop-pages in order to reduce the duration of the stoppage. In some specific maintenance activities firms do not have sufficient capabilities do it on their own and they have to rely on original equipment manufacturers. In certain demanding components of a paper machine, there are only two or three service providers who really can do the job. This condition may lead to major hold-up problems. Nevertheless, in some cases relying on the manufacturers is the preferred choice because of low frequency of these occurrences.

*“You don’t need any specialists or own employees in these jobs... just call some firm and they can build up electricity for lamps or some common motors...”*

*“In these certain jobs when the manufacturer comes to repair their own machines, they are so rare... there is no sense in training our own people for that...the know-how would not remain...”*

*“We have outsourced about half of the maintenance. We have estimated those strategic parts of maintenance with which we can gain some competitive advantage...”*

In the future outsourcing of maintenance activities can be predicted to increase. However, there was not enough experience in this project to evaluate how well these totally outsourced maintenance activities work. Up to this date the interviewees were quite satisfied.

*“In the technological sense this business is not rocket science...there are just various machinery parts combined in a certain order...there are many capable people...”*

All the firms have kept research and development activities inside the firm boundaries, but they have usually been concentrated in consolidations. However, managers from Firm 2 emphasized the fact development have to be done in close co-operation with sales and production. Some basic research is done externally in co-operation, for example with educational institutes and the research company KCL related to the paper and forest industries.

Except for Firm 1, external logistics have been outsourced. Firms 2, 3 and 4 do not own any transportation vehicles. One manager of Mill A said that they have recognized that there may be some notable scale benefits in outsourcing transportation. Mill C needs special equipment to move products from a factory to the harbor. They would have had outsourced the transportation regardless of possible asset specificity problems, but the state authority denied it. Logistics management has been kept inside in all the firms, and it is usually a shared service on the consolidation level. Mill E has outsourced half of its logistics management.

Order and production management has been kept within all the firms' boundaries. Especially the general manager from Mill D considered production management an important function, and stated that it works in very close co-operation with all the production activities.

**Table 15. Support activities and outsourcing.**

<b>Support activities</b>	<b>A.</b>	<b>B.</b>	<b>C.</b>	<b>D.</b>	<b>E.</b>	<b>F.</b>
Technological development	In/Out	In/Out	In/Out	In/Out	Out	Out/Shared
Waste management	Out	Out	Out	In/Out	Out	Out
Internal logistics	In	Out	Out	In	Out	In
Production infrastructure (services)	In/Out	In/Out	Out	In/Out	Out	Out
Quality control	In	In	In/Out	In	In	In
Maintenance	In	In/Out	In/Out	In/Out	Out	Out
R & D	In/Shared	Shared	Shared	Shared	Shared	Shared
External logistics	In/Out	Out	Out	Out	Out	Out
Logistics management	In	Shared	Shared	Shared	In & Out	N/A
Order and production management	In	In	In	In	In	In

### 4.7.3 Shared activities

The support activities employed by all other activities by the firm are usually kept within, but shared on a consolidation level. Mill A did not provide enough information to conclude whether those activities have been concentrated on the consolidation level or not. Only human infrastructure services can be considered working on the mill level, and almost without exception they are outsourced. Human infrastructure services consist of activities like food services, security and medical services. The reasons were clear: they are quite distant from the core activities and a mill can attain almost all the benefits, such as cost savings and improved flexibility, that are possible to gain with outsourcing. It was interesting to find out that Mill D has not outsourced medical services and they are selling their services to nearby firms. This arrangement is quite the opposite of what the other mills are doing.

**Table 16. Shared activities and outsourcing.**

<b>Shared services</b>	<b>A.</b>	<b>B.</b>	<b>C.</b>	<b>D.</b>	<b>E.</b>	<b>F.</b>
Financial administration	In	Shared/In	Shared/In	Shared/In	Shared/In	Shared
Human resource management	In	Shared/In	Shared/In	Shared/In	In	Shared
Human infrastructure services	In/Out	Out	Out	In/Out	Out	Out
Information systems	In/Out	Shared: In/Out	Shared: In/Out	Shared: In/Out	Out	Shared



## 5 CONCLUSIONS

The starting point for the study was to build understanding of the activities in a pulp and paper mill and how the boundaries of a pulp and paper firm are defined. The purpose was to understand the subject in order to create a solid base for future research. Beforehand, there was no knowledge of how the theoretical framework of this study can be used to explain the boundaries of a firm in the pulp and paper industry. In this sense, the study can be concerned a success. An activity chart and a value chain were compiled, which were later deemed viable in the interviews. All the goals concerning finding the nature of the activities and characterizing them with the theoretical framework were accomplished. The resource-based view of a firm and transaction cost economics can be used to explain the boundaries of a firm in the pulp and paper industry. There were no major conflicts between these two theories and they complemented each other as was suggested in the introduction. Especially in the core activities both theories suggested that internal production would be the preferred choice, which makes the results of this study more credible. The attributes of the theoretical framework were used in the decision-making process in the pulp and paper firms, but usually instead of using theoretical terminology, they used common language and terms. All the research objectives and questions that were set at the onset were successfully met.

The research method was qualitative, because the Author's understanding of the subject was so restricted that quantitative methods could not be used. Nevertheless, qualitative methods seemed to work fine in this kind of an explorative study. The interview methods can be justified with the same reason. There was not enough information and understanding of the subject, so more formalized interview methods would have been useful. With theme interviews

it was possible to build basic understanding on the subject. In the future, it is viable to use structured forms to get more comparable results and even use quantitative methods to strengthen the reliability of the research.

The choices made in this study about the theoretical framework worked quite well. However, we have to remember that the theme interviews were based on a theoretical framework, so it is no wonder that the framework was quite useful in explaining the boundaries of a firm. Operationalization of the theoretical framework was a big challenge, because theoretical terminology was not used in the interviews. Moreover, the theoretical framework was not well known among the interviewees. The value chain figures used in the interviews functioned surprisingly well. There were no major remarks made on them by the interviewees.

Alternatively, the dynamic capabilities concept could have been used instead of the resource-based view. Transaction cost economics might have given a better view of the boundaries of a firm, if we had used the dynamic extension of the theory. Both extensions would have put more weight on the future of the firm and on developing capabilities. They might have explained boundary choices better and given more accurate information in situations where the boundary choice was based on building competences for future competition.

There are some restrictions with the results, caused by the qualitative methods. It has to be questioned how valuable these core assets mentioned in the interviews are, because interpretation is based only in the interviews. There were no value creation calculations. One way to accomplish them would have been to calculate the difference between the stock market value and replacement value of the assets, but these calculations would only give us the value of the whole intangible resource bundle. We would still not get any values of separable resources or activities. However, considerations about inimi-

tability can be regarded fairly accurate; we did get some durations of how long it takes to transfer knowledge.

The problem is similar with transaction costs: we did not make any calculations and estimates are based on broad evaluations and interpretations. Answers are not very comparable. In this sense the theme interviews seemed to be a slight failure. Some kind of a structured form would have given better results, which would have been comparable and more accurate. It would have been possible to at least to some extent measure and compare transaction costs so that less would have been based on the interpretations of the Author. However, measuring transaction costs accurately is commonly deemed difficult. This is one of the main reasons why Coase began to develop his theory of transaction costs.

In conclusion, the most valuable and specific parts of the value chain are located in the core production process and in some activities closely around it. This can be explained by findings made in Chapter 4. Firms have kept those activities inside the firm that they deemed valuable and specific.

What comes to the support activities, there were some interesting findings. According to the theoretical framework they can be outsourced; however, there are quite many activities still performed within a firm. In Mills C and E it was considered that at the moment they would not do any further outsourcing. According to the interviews, Mills C, E and F were the ones, where restructuring of the boundaries of the firm had gone the furthest. In Mill A one interviewee considered that there still are some activities that eventually will be outsourced. It was interesting to see that one of the interviewees in Mill A was strongly opposed to outsourcing. It is probable that especially in maintenance, there will be some boundary restructuring in the future. However, it is hard to evaluate which of the maintenance structures, the model of Firm 2 or

Firm 3, will become dominating in the industry. In this view, the maintenance and service structure of Firm 1 can be considered somewhat outdated.

Factors behind competitive advantage were clearly recognized by the decision-makers in pulp and paper firms in making boundary choices. All the interviewees emphasized the know-how that they have in the core production process and in activities directly related to it. Technological resources can be considered mobile and available to all the firms just by throwing in some money. This leads to a condition where superior technology does not give any long-term competitive advantage. This condition is true even in cases in which the technology has developed inside the firm: knowledge will leak to competitors in a couple of years.

Transaction cost economics determinants were also recognized, and they were mainly related to asset specificity. It was interesting to find that behavioral uncertainty can be interpreted to be quite high in activities with high asset specificity. This may support the view that core production activities can be considered rare and inimitable because of their complexity. The positive correlation between value creation and specificity of assets can be considered quite clear. The main consequence of this condition is that it supports the decision to keep at least certain industry specific assets and activities inside the firm. However, the term *asset specificity* was not used in the discussions and usually the interviewees talked about dangers of the supplier using its monopolistic position against the firm. Monopoly does not necessarily mean that there are significant hold-up problems.

Also, the problems and costs of managing were recognized and deemed important factors in deciding about boundaries for activities distant from the core. However, only one interviewee saw major management costs in pulp and paper integrates.

*“Nobody really understands this kind of integrate as a whole... It’s highly probable that there are some overlapping activities...”*

It was frequently explained during the interviews that there is no sense in outsourcing if cost savings are only marginal. These kinds of statements work as evidence for the existence of transaction costs in the pulp and paper industry. All agreed that outsourcing decisions were and have to be based on technical and economic evaluations. However, knowledge issues were deemed important in the core activities and in strategically important activities. We have to remember that there is no sense to outsource just for outsourcing. There have to be clear cost or quality benefits to be attained. A general manager from Mill B stated that after all in many cases job costs are the same regardless of whether something is produced internally or externally.

*“In the end, euro is a quite good consultant...”*

The labor union is completely opposed to any outsourcing in the pulp and paper industry, and this is acting as one major restricting factor to outsourcing. The labor union would not want to allow workers external to the paper industry’s collective agreement on terms of employment to work in the plants. However, the power of the labor union is eroding. It also has to be taken into consideration that workers are afraid of outsourcing, and it has a negative impact on worker motivation. These issues are beyond this theoretical framework. The influence of the labor union can explain some boundary choices that were not recommended by this theoretical framework. However, three of the mills have done major scale outsourcing without being noticeably interfered by the labor union.

*“Workers are afraid of outsourcing...motivation will disappear if they have a*

*constant fear of losing their jobs.”*

*“...if an external service provider will have to take all these people with labor union contracts... it is not outsourcing...there will be no cost savings...”*

Based on the results from this study, only core production activities are the ones that should be held within the firm in all conditions. In activities that have a direct impact on efficiency or quality, there was not enough knowledge to decide if it is better to insource or outsource. Outsourcing, for example in critical maintenance activities, is quite a new phenomenon and we cannot draw any conclusions either if it is better to use the market or hierarchy. The market supply in these activities will increase in the future, and it is possible that there may be some major cost and quality benefits to be attained if the market option is used. The main question is if these benefits can outweigh any transaction costs involved. In trivial activities there seems to be no problems with using the market option. The only problems are in the supply side, because in many activities and services there are no external providers. There will be no cost savings or quality advantages attainable if a service is created just for one paper mill.

## REFERENCES

Amit, R. & Schoemaker, P. 1993. Strategic Assets and Organizational Rent. *Strategic Management Journal*. Vol 14. pp. 33-46

Arend, R. 2006. Tests of the Resource-Based View: Do the Empirics Have Any Clothes? *Strategic Organization*. Vol 4, nro 4. pp. 409-422

Argyres, N. 1996. Evidence on the Role of Firm Capabilities in Vertical Integration Decisions. *Strategic Management Journal*. Vol 17. pp. 129-150

Arnold, U. 2000. New dimensions of outsourcing: a combination of transaction cost economies and the core competencies concept. *European Journal of Purchasing & Supply*. Vol 6

Baden-Fuller, C., Targett, D. & Hunt, B. 2000. Outsourcing to outmanoeuvre: Outsourcing re-defines competitive strategy and structure. *European Management Journal*. Vol 18, nro 3. pp. 285–295

Balakrishnan, S. & Fox, I. 1993. Asset Specificity, Firm Heterogeneity and Capital Structure. *Strategic Management Journal*. Vol 14, nro 1. pp. 3-16.

Balakrishnan, S. & Wernerfelt, B. 1986. Technical Change, Competition and Vertical Integration. *Strategic Management Journal*. Vol 17. pp. 347-359

Barney, J.B. 1986. Strategic factor markets: Expectations, luck and business strategy. *Management Science*. Vol 32, no. 10.

Barney, J.B. 1990. The Debate Between Management Theory and Organiza-

tional Economics: Substantive Differences or Intergroup Conflict. *Academy of Management Review*. Vol 15, no. 3. pp. 382-393

Barney, J.B. 1991. Firm resources and sustained competitive advantage. *Journal of Management*. Vol 17, no. 1. pp. 99-120.

Barney, J.B. 1996. *Gaining and sustaining competitive advantage*. The Ohio State University. Addison-Wesley Publishing Company.

Barney, J.B. 1999. How a firm's capabilities affect boundary decisions. *Sloans Management Review*. Vol 40, no. 3. pp. 137-145

Black, J. & Boal, K. 1994. Strategic Resources: Traits, Configurations And Paths To Sustainable Competitive Advantage. *Strategic Management Journal*. Vol 15. pp. 131-148

Blomqvist, K., Kyläheiko, K. & Virolainen, V.-M. 2002. Filling a Gap in Traditional Transaction Cost Economics: Towards Transaction Benefits-Based Analysis. *International Journal of Production Economics*. Vol 79. pp. 1-14.

Chen, H. & Chen, T.-Y. 2003. Governance structures in strategic alliances: transaction cost versus resource-based perspective. *Journal of World Business*. Vol 38. pp. 1-14

Chi, T. 1994. Trading in strategic resources: necessary conditions, transaction cost problems and choice of exchange structure. *Strategic Management Journal*. Vol 15, no. 4. pp. 271-290.

Coase, R. H. 1937. The Nature of the Firm. In: Williamson, O. E. & Winter, S. (ed.) *The Nature of the Firm*. 1991. New York: Oxford University Press.



Coase, R. 1992. The Institutional Structure of Production. *The American Economic Review*. September.

Collis, D. & Montgomery, C. 1995. Competing on resources: Strategy in the 1990s. *Harvard Business Review*.

Conner, K.R. 1991. A Historical comparison of resource-based theory and five schools of thought within industrial organization economic: do we have a new theory of the firm. *Journal of Management*. Vol 17, no. 1. pp. 121–154

Das, T.K. & Teng, B-S. 2000. A Resource-based theory of strategic alliances. *Journal of Management*. Vol 26, no. 1. pp. 31–61

Dierickx, I. & Cool, K. 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Science*. Vol 35, no. 12. pp. 1504-1511.

Espino-Rodriguez, T. & Padron-Robaina, V. 2004. Outsourcing and its impact on operational objectives and performance: a study of hotels in the canary Islands. *Hospitality Management*. Vol 23, no. 3. pp. 287–306

Fahy, J. 2000. The Resource-based view of the firm: some stumbling-blocks on the road to understanding sustainable competitive advantage. *Journal of European Industrial Training*. Vol 24. pp. 94-104.

Foss, K. & Foss, N. 2005. Resources and Transaction Costs: How Property Rights Economics Furthers The Resource-Based View. *Strategic Management Journal*. Vol 26. pp. 541-553

Galbreath, J. 2005. Which resources matter the most to firm success? An exploratory study of resource-based theory. *Technovation*. Vol 25, no. 9. pp. 979–987

Gilley, K.M. & Rasheed, A. 2000. Making more by doing less: An analysis of outsourcing and its effects on firm performance. *Journal of Management*. Vol 26, no. 4. pp. 763–790

Godfrey, P. & Gregersen, H. 1999. Where do resources come from? A model of resource generation. *The Journal of High Technology Management Research*. Vol 10, no. 1. pp. 37-60.

Grant, R.M. 1991. The Resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review*. Vol 5, no. 3. pp. 114–135

Heide, J. & John, G. 1988. The Role of Dependence Balancing in Safeguarding Transaction-Specific Assets in Conventional Channels. *Journal of Marketing*. Vol 52, no. January. pp. 20-35

Heide, J. & John, G. 1990. Alliances in Industrial Purchasing: The Determinants of Joint Action in Buyer-Supplier Relationship. *Journal of Marketing Research*. Vol 17, no. 1. pp. 24–36

Hirsjärvi, S. & Hurme, H. *Tutkimushaastattelu: Teemahaastattelun teoria ja käytäntö*. 2001. Helsinki. Helsinki University Press.

Hirsjärvi, S., Remes, P. & Sajavaara, P. 2005. *Tutki ja kirjoita*. Helsinki. Kustannusosakeyhtiö Tammi.

Holmström, B. & Roberts, J. 1998. The boundaries of the Firm Revisited. *Journal of Economic Perspectives*. Vol 12, no. 4. pp. 73-94

Humphreys, P.K. & Lo, V.H.Y. & McIvor, R.T. 2000. A decision support framework for strategic purchasing. *Journal of Materials Processing Technology*. Vol 107, no. 1-3. pp. 353–362

Lado, A., Boyd, N., Wright, P. & Kroll, M. 2006. Paradox and theorizing within the resource-based view. *Academy of Management Review*. Vol 31, no. 1. pp. 115-131

Lamberg, J.-A., Näsi, J., Ojala, J. & Sajasalo, P. 2006. *The Evolution of Competitive Strategies in Global Forestry Industries*. Dordrecht, Netherlands. Springer.

Mahoney, J.T. 1992. The Choice of Organizational Form: Vertical Financial Ownership Versus Other Methods of Vertical Integration. *Strategic Management Journal*. Vol. 13, no. 8. pp. 559-584

Mahoney, J.T. 2001. A Resource-based Theory of Sustainable Rents. *Journal of Management*. Vol 27, no. 6. pp. 651–660

Mathews, J.A. 2002. A Resource-based view of Schumpeterian Economic Dynamics. *Journal of Evolutionary Economics*. Vol 12, no. 1 / 2. pp. 29–54

Metsäteollisuus. 2000. *Avain Suomen metsäteollisuuteen*. Helsinki. Metsäteollisuus Oy.

Milgrom, P. & Roberts, J. 1992. *Economic, Organization & Management*. New Jersey. Prentice-Hall Inc.

Miller, D. & Shamsie, J. 1996. The Resource-Based View of the Firm in Two Environments: The Hollywood Film Studios from 1936 to 1965. *Academy of Management Journal*. Vol 39, no. 3. pp. 519-543

Nurminen, M. 2001. Strategisen yksikön ulkoistaminen. Lahti. Teknillinen korkeakoulu Lahden keskus.

Ohanian, N.K. Vertical Integration In the U.S. Pulp and Paper Industry, 1900-1940. *The Review of Economics and Statistics*. pp. 202-207

Pajarinen, M. 2001. Ulkoistaa vai ei – Outsourcing teollisuudessa. Helsinki. ETLA.

Peteraf, M.A. 1993. The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal*. Vol 14, no. 3. pp. 179–191

Penrose, E.T. 1968. *The Theory of the Growth of the Firm*. Oxford. Blackwell & Mott.

Poppo, L. & Zenger, T. 1998. Testing Alternative Theories of the Firm: Transaction Cost, Knowledge-Based, and Measurement Explanations for Make-or-Buy Decisions in Information Services. *Strategic Management Journal*. Vol 19. pp. 853-877

Porter, M. 1980. *Competitive Strategy*. New York. The Free Press.

Porter, M. 1988. *Kilpailuetu (Competitive Advantage - Creating and Sustaining Superior Performance)*. Espoo. Weilin+Göös

Porter, M. 1991. Towards a Dynamic Theory of Strategy. *Strategic Management Journal*. Vol 12. pp. 95-117

Prahalad, C.K. & Hamel, G. 1990. The Core Competence of the Corporation. *Harvard Business Review*

Rindfleisch, A. & Heide, J. 1997. Transaction Cost Analysis: Past, Present, and Future Applications. *Journal of Marketing*. Vol 61, no. October. pp. 30-54

Roodhooft, F. & Warlop, L. 1999. On the role of sunk costs and asset specificity in outsourcing decisions: a research note. *Accounting, Organizations and Society*. Vol 24. pp. 363-369

Rumelt, R.P. 1991. How much does industry matter? *Strategic management Journal*. Vol 12. pp. 167-185.

Sartorius, K. & Kirsten, J. 2004. The Boundaries of the firm: why do sugar producers outsource sugarcane production? *Management Accounting Research*. Vol 16, no. 1. pp. 81-99

Teece, D.J. 1996. Firm Organization, Industrial Structure, and Technological Innovation. *Journal of Economic Behavior & Organization*. Vol 31. pp. 193-224

Uusitalo, H. Tiede, tutkimus ja tutkielma: Johdatus tutkielman maailmaan. 2001. Helsinki. WSOY.

Walker, G. 1988. Strategic Sourcing, Vertical Integration, and Transaction Costs. *Interfaces*. Vol 18, no. 3. pp. 62-73

Walker, G. & Poppo, L. 1991. Profit Centers, Single-Source Suppliers, and Transaction Costs. *Administrative Science Quarterly*. Vol 36.

Walker, G. & Weber, D. 1987. Supplier Competition, Uncertainty, and Make-or-Buy Decisions. *Academy of Management Journal*. Vol. 30, no. 3. pp. 589-596

Watjatrakul, B. 2005. Determinants of IS sourcing decisions: A comparative study of transaction cost theory versus the resource-based view. *Journal of Strategic Information Systems*. Vol 14, no. 4. pp. 389–415

Wernerfelt, B. 1984. A Resource-based View of The Firm. *Strategic Management Journal*. Vol 5. pp. 171-180.

Williamson, O.E. 1979. Transaction-Cost Economics: The Governance of Contractual Relations. *Journal of Law and Economics*. Vol 22, no. 2. pp. 233–261

Williamson, O.E. 1985. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. New York. Free Press.

Williamson, O.E. 1991. Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Administrative Science Quarterly*. Vol 36. pp. 269–296

Yasuda, H. 2005. Formation of strategic alliances in high-technology industries: comparative study of the resource-based theory and the transaction-cost theory. *Technovation*. Vol 25, no. 7. pp. 763–770

