

THE EVOLUTION OF COMPETITIVE STRATEGIES IN GLOBAL FORESTRY INDUSTRIES

The Evolution of Competitive Strategies in Global Forestry Industries

Comparative Perspectives

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FOREWORD

All industries cease to exist after their life cycle approaches the end in which the old modes of action create legitimacy no more. Our initial motivation was to analyze the entire life cycle of the global forestry industry both in order to attain a better historical understanding and a more educated perspective about the future of the industry. The first versions of the book chapters were presented at the European Business History Association's annual meeting in Oslo 2001. The importance of this occasion has been paramount for the project and we gratefully acknowledge the support and comments by Professors Sverre Knutsen, Knut Sögner, and Matthias Kipping. Already earlier two persons had taken up the important role of supporting and mentoring the idea to study competition from a longitudinal perspective. Without Professor Jyrki Kettunen and Ms. Christine Hagström-Näsi this book would not have been realized. Christine's role was also important from the perspective that Finnish Technology Agency Tekes has sponsored projects that have devoted resources for this book project. Finnish Academy's support has also been crucial.

Reflecting the interdisciplinary nature of the research team, we have received comments and support from a variety of colleagues along these years. The list of persons we can thank here can not be exhaustive, but we would like to at least acknowledge the role of Professors Jorma Ahvenainen, Antti Ainamo, Jari Eloranta, Petri Karonen, Tomi Laamanen, Peter Murmann, Saku Mäkinen, Matti Palo, Grant Savage, and Henrikki Tikkanen. The advisory board in the Tekes projects, consisting of the managing directors of a number of Finnish forestry industry firms and governmental officers, has provided us useful comments. We owe our gratitude to Seppo Suuronen, Aila Maijanen, Kenneth Hernberg, Tero Kaleva, Marjariitta Rahkila, Jorma Saarikorpi, Riitta Salo, Markku Silenius, Leena Paavilainen, Reima Sutinen, and Juhani Kyytsönen. During the years of completing this process many assistants have helped us in collecting and storing the information, and some of them have already received their Ph.D's. From this group we would like to thank especially Mika Skippari, Kalle Pajunen, Manu Aunola, Maare Valtonen, Pasi Saarimäki, Riku Kaistinen, and Vesa-Pekka Grönfors. Anne Kuivalainen performed an extensive amount of work in completing the book's layout.

Strategy is manifested in all phases of a company's evolution and finally, strategy becomes a story of the company's past actions. It is the last aspect we have addressed in this book. However, all the dimensions of strategy are intertwined in such a complex way that it may be unnecessary to maintain any demarcation lines between intention, action, and history in the traditional sense. Thus, we hope the book would be of interest for a variety of readers in the academia and business – it was fun to make and hopefully equally fun to read!

Helsinki – Jyväskylä – Tampere, June 2005
The Editors

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CHAPTER 1

EVOLUTION OF COMPETITIVE STRATEGIES IN GLOBAL FORESTRY INDUSTRIES: INTRODUCTION

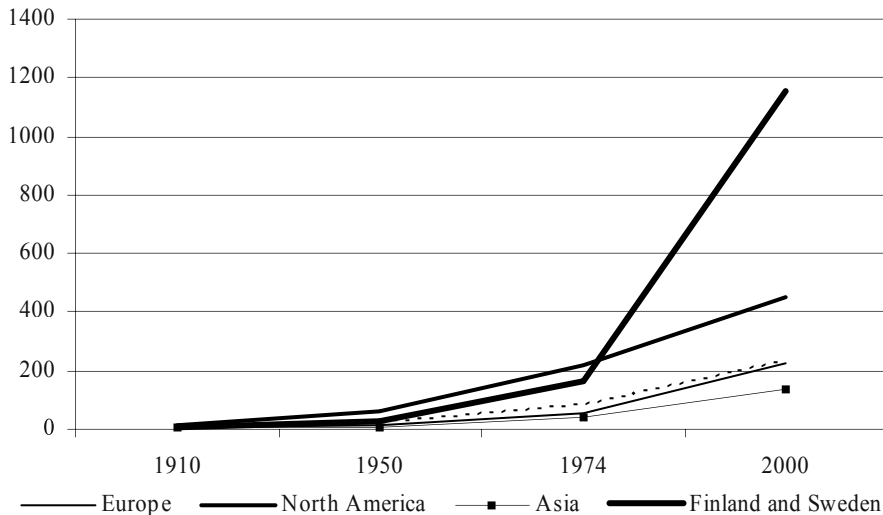
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There are few issues more vital and interesting in strategic management than that of a competitive battle where the once leading companies are dethroned from their position by the rise of new market leaders (Ferrier, 2001). Industries differ, however, considerably in terms of the frequency and scale of competitive actions, aggressiveness and the length of such battles (Smith, Ferrier, & Grimm, 2001). In less mature industries competitive battles and processes leading to changes in market structure are hectic and can occur over a period of months or even years (Porter, 1980; Rindova & Kotha, 2002). In more mature and capital intensive industries the duration of radical changes in competitive structure can be measured in decades and the amount of competitive actions is scarce vis-à-vis more intensive settings (Klepper, 1996; Murmann, 2003b; Rose, 2000).



Sources: Database of Paper and Pulp companies of the world compiled by the authors. The database is available at: <http://www.cc.jyu.fi/~jaojala/>. The Number of Cases is presented in Tables 1.1 and 1.4 and information about the sources in section “Data”.

Note: the dash line refers to all companies in population.

Figure 1.1. Average annual paper production in European, North-American, Asian, and Nordic (Finnish and Swedish) companies 1910, 1950, 1974, and 2000 (thousand tons).

The paper and pulp industry is an archetypical example of a mature industry that has evolved through the constant increase in competitive intensity from the late 19th century onwards into a global rivalry between a few dominant firms in the early 21st century. As the Figure 1.1 partly illustrates, through constant imitation of their North American competitors Nordic companies have been able to catch up the traditional market leaders in terms of profitability, volume (Figure 1.1) and productivity (Lamberg, 2005; Lamberg & Ojala, 2005). The main purpose of this book is to analyze this process from the perspective of the strategic actions undertaken by Nordic and U.S. companies. Consequently, we focus on the a) company-level evolution of strategies, b) co-evolutionary interplay between firms and their institutional and competitive environment and c) on the differences and similarities between individual firms and nations.

Four elements of evolution are especially important to understanding the dethronement processes. First, we analyze firms from a variety of national contexts. This makes the comparisons relevant from the point of view that the nationality of the firms may explain differences in performance and strategy. Second, our sample includes firms with different governance structures. We analyze publicly traded, family owned and state owned firms as well as cooperatives. Accordingly, the related research question focuses on how the ownership structure is manifested in strategic actions (Chen & Hambrick, 1995; Miller & Chen, 1994). Third, we study

the firm-specific strategy profiles. Thus, the study results in new information on how firms compete vis-à-vis industry trends and what reciprocal effects this has on performance. Fourth, and perhaps most importantly, we study the path dependent strategic processes (Puffert, 2002) leading to success and failure of firms thus seeing the performance outcomes as a function of firms' history and current competitive and institutional environment.

This chapter now proceeds as follows. First, we present the theoretical and conceptual underpinnings of the book focusing especially on industry evolution, competitive dynamics and path dependence. Second, we focus on the industry and especially on the industry dynamics by describing the trends in production volume and focus, technological regimes and changes in the competitive structure of the industry. Third, we explain the methodological issues regarding the case studies and cross-case comparisons and finally, we shortly describe the structure of the whole book.

1 THEORETICAL BACKGROUND¹

Evolutionary patterns of firms and the dethronement processes in an industry are issues that are not easily uncovered via one specific theoretical perspective (Murmman, 2003a; Murmman & Homburg, 2001). Instead, the understanding of such issues requires broad and context-specific theoretical apparatus (Colli & Rose, 1999; Rose, 2000). At best, such a framework can shed light on each specific case and on the overall explanation of the industry evolution in the context of forest industries (Lamberg & Ojala, 2005). In this book, we focus on three interrelated conceptual perspectives. First, the strategic actions of firms constitute the dynamics of competition in our specific research setting. Second, the principle of path dependence helps to understand the constraining power of history, institutions and the competitive / technological environment on firms' strategic action and evolution. Finally, the different governance structures of the firms potentially drive strategic actions and, for example, deviate family firms from the larger publicly owned companies in terms of their strategic actions and performance (Chen & Hambrick, 1995). In the next sections, we offer a brief overview of these issues which will be deepened and enhanced in the context of the empirical cases.

1.1 Strategy, Evolution and Competitive Dynamics

In this book, strategy is simply defined as the pattern of actions over time. Regarding evolution, we follow Greve (2002, p. 558) who defines evolutionary explanation as “[...] historical contingency, that is, early events [...] are consequential for the subsequent evolution and to some degree arbitrary. [Also], the mechanisms of evolution are systematic and consequential, since diffusion processes predictably cause practices to spread throughout a population.” Accordingly, strategy evolution is seen as a product of competitive actions and reactions.

¹ An earlier version of this section was published in Juha-Antti Lamberg, *Strategic Action and Path Dependence: Profiles and Archetypes of Competitive Behaviour in a Global Industry* (2005).

Following Miller and Chen (1994), by competitive action we refer to “...a specific and observable competitive move, such as new product introduction, an advertising campaign, or price cut, initiated by a firm to improve or defend its relative competitive position.” We essentially see that these actions are manifestations of the structural and cognitive configurations of the firms as well as constantly shaping these configurations along firms’ evolution.

Various research streams of which the most notable is the ‘Maryland-project’ have laid out this competitive dynamics logic (Chen & Hambrick, 1995; Chen & Miller, 1994, 1996; Ferrier, Smith, & Grimm, 1999; Hambrick, Cho, & Chen, 1996; Miller & Chen, 1994). During the 1980s—1990s, a group of researchers studied competitive actions mainly in the context of the U.S. airline industry. In essence, researchers found that the repertoire of competitive actions was relatively limited, that actions correlated with the market position and economic resources of the companies and that the industry level dynamics emerged as a consequence of the bilateral action—reaction pairs between competitors (Smith, Ferrier, & Ndofor, 2001).

In a mature industry that has been divided into relatively separate market areas (U.S. and Western Europe being the most relevant from our perspective), it cannot be expected that intensive rivalry between competitors, at least in a global setting before 1980s, would materialise. Figure 1.2, building on Chen (1996), illustrates the continuum from firm-specific isolated development processes to the more intensive competitive setting between firms from different national contexts.

Commonality In Product Market	High	Downstream Rivalry: Constant competitive interaction in the product market	Intensive Rivalry: Constant competitive interaction between the firms
	Low	High Independency: Marginal competitive interaction between the firms	Upstream Rivalry: Constant competitive interaction in the raw material market
		Low	High
		Similarity in Resource Market	

Figure 1.2. Dimensions of Competitive Rivalry.

Accordingly, we may expect that at least in the global setting the level of rivalry was very low until the 1990s. In geographically constrained areas, such as Finland or Canada, the competition potentially focused on crucial resource markets and in

particular on lumber. Moreover, the existence of national cartels in Europe seemingly filtered the competitive intensity in the European product market until the 1980s. Thus, the concentration on firm-specific strategic actions tells more about the firm-level evolution than about the intensity or nature of competition as such. Perhaps unconventionally, we emphasize that past actions have to be seen as contingencies to present strategic decisions. This leads us to the concept of path dependence.

1.2 Path Dependence

During the latter part of the 1990s and at the beginning of 2000, the concept of path dependence was transferred from economic history and new institutional economics to strategic management research. The term has been used for example in building research models to study internationalization and technological development and to explain first-mover advantage (Barnett, Mischke, & Ocasio, 2000; Eriksson, Majkgard, & Sharma, 2000; Mueller, 1997; Schilling, 1998). Generally, path dependence has been used in contexts where the purpose is to generate dynamic and evolutionary perspectives on organization and management research (Barnett & Burgelman, 1996).

The basic idea in path dependency is that processes are not only contingent on the context in which they occur, but also on their own histories (Arthur, Ermoliev, & Kaniovski, 1987). Paul David (2001) has defined path-dependent processes as contingent and non-reversible. Furthermore, he has underlined that events happen, but never un-happen. The positive definition of path dependence would thus be:

A path-dependent stochastic process is one whose asymptotic distribution evolves as a consequence (function) of the process' own history. (David, 2001)

Paul David's definition has been criticized for its empirical background in the QWERTY – discussion and regarding the legality of different degrees of path dependence (David, 2001). Nevertheless, together with Brian Arthur's contribution David's basic definition offers a meaningful perspective by which to understand the antecedents of strategic action (Arthur, 1989, 1990, 1993, 1997; Arthur et al., 1987). For example, Arthur's notion that innovations (in the technological sense) result from new combinations of existing technologies is easily transferable to the uncovering of patterns of strategic actions (Arthur, 1989). Furthermore, path dependence (as a concept) allows the possibility to import principles of complexity theory into strategy research. For example, the assumption that small events may create uncalculated tremors somewhere else is evidently a valid perspective in explaining various evolutionary processes leading to certain firm specific behavioural patterns (Brown & Eisenhardt, 1997; Stacey, 1995).

For this study, the concept of path dependence links together both theoretical aspects from strategic management literature and empirical explorations from the case studies². A crucial suggestion is that strategy processes have a path dependent

² It should be noted that there exists strong opposition to using complexity science as a metaphor. (McKelvey, 1999)

character: past decisions shape the set of possible strategies in the future (David, 1986; North, 1990). Thus, strategic action is seen as contingent on both environmental factors (institutions, competition) and the historical strategic paths. Therefore, the historical experiences of organizational actors shape their interpretations of the environment³ and create trajectories for future actions.

As said, the primary empirical goal in this study is to analyse how firms have behaved strategically during environmental changes and what role implemented strategic actions have played in organizational development. For further analysis, the independent contextual factors that have affected the historical development of the case companies are divided into three groups: competitive environment, (inter-organizational) institutional environment and intra-organizational level. The main argument is that both competitive and institutional elements affect organizations' strategy processes in addition to their own historical experiences.

In different evolutionary or co-evolutionary models the environment is seen either as the ultimate determinant of organizational behaviour or as a macro-level context that might slowly change as a consequence of the micro evolution inside organizations (Burgelman, 1994; Lewin & Volberda, 1999). Our perspective on strategy evolution accepts the strong impact of environmental variables but takes into account both the influence of strategic choices and the processes' own histories, i.e. the path-dependent dimension. This dialectic approach is argued to improve existing process models by integrating the time, timing and history into the organization—environment dialogue. Thus, the perspective takes into account the possibility to make strategic choices, but that once they are made, they cannot be repeated.

The aim is to use the conceptual framework to highlight possible factors affecting firms' strategy processes and historical development. Moreover, the emphasis is to help to interpret firm-level strategic choices. Hence, institutional and competitive elements are imbedded into the study as explanatory factors but they are not measured as variables causing organizational decisions. Rather, competitive and institutional environments create the context in which organizations operate (Alston, Eggertsson, & North, 1996). Organizations in general and firms in particular, however, are independent entities strongly affected by their governance structure and management.

1.3 Governance Structures in the Forest Industry

As Holmström and Roberts (1998) argue, ownership patterns are not determined by relation to specific circumstances, but rather due to the wide variety of circumstances, long time span, and path dependent processes. This can be detected also in the case of forest industry firms. Most of the firms originated as family owned enterprises; some of them evolved into becoming limited liability companies,

³ Compared to classic organization theory that sees the organizational decision-making as a function of organization's previous history ("...the behaviour of an organism through a short interval of time is to be accounted for by its (1) internal state at the beginning of the interval, and (2) its environment at the beginning of the interval...determine...the behaviour...what the internal state will be at the next moment of time.") (March & Simon, 1963)

and a few into multinational corporations with an international – sometimes even institutional – ownership structure. The era of family owned firms seems to be over in the case of the larger companies. That can be detected also from the articles in this volume. However, small and medium sized, mostly family firms are still important to the forest industries especially in small niche markets that require constant innovations and consistency in actions.

The evolution of the ownership has developed in line with the overall economic development. The paper and pulp industry firms were mostly founded during the age of industrial capitalism, they emerged and grew domestically through organic growth, mergers, and acquisitions during the era of financial capitalism, and finally, internationalisation of operations occurred during the age of global capitalism during the post war era (Cantwell, 1989; Chandler, 1977, 1990).

The origins of today's paper industries can be traced to the late 19th century, when paper mills started to use softwood fibre as raw material. Typical companies were small, basically one-mill companies and situated near raw materials and an adequate energy supply (Minami, 1977). As Skelton stated at the beginning of the 20th century, paper and pulp production was (and partly still is) dependent on four factors, namely: 1) a cheap and convenient supply of spruce; 2) a cheap and ample supply of water power to operate heavy pulp-grinding machinery; 3) water of a quality suitable for use in mixing pulp; 4) cheap routes to markets (Skelton, 1906). Together these features determined the early geographical location of paper and pulp industries during the age of industrial capitalism.

In the United States as a consequence of massive mergers and reorganisation, banks gained control of the major industries during the late 19th century. The first merger wave occurred in the paper and pulp industries at the turn of the 19th and 20th century – the mergers were financially supported by the financial institutions. For example, giants such as International Paper and Enso were created during that period (Skelton, 1906; Ahvenainen, 1992a). In the U.S. between 1912–1939 bank control had already faded away due to political reaction against financial institutions (Simon, 1998; Fligstein & Feeland, 1995; Davis & Mizruchi, 1999). Though similar actions were taking place also in several other countries, in order to weaken the influence of financial capitalism, the financial institutions still retained a vital position within the business world, being at the centre of the networks of the economic actors up until the 1980s and 1990s (Davis & Mizruchi, 1999; Mizruchi, 1982, 1992; Mizruchi & Stearns, 2001; Buchinsky & Polak, 1993; Neal, 1990; Simon, 1998).

The rise of multinational corporations marked the end of financial capitalism during the late 20th century: within global capitalism the multinational companies are in many cases much larger than the domestic financial institutions (Cantwell, 1989; Cassis, 1997). The globalisation period within forest industry production started rather late which can be detected also from the case studies analysed in this volume. Though the markets for forest industry products, especially for Nordic companies, have been mainly abroad, production has continued on a domestic basis (Heikkinen, 2000; Sajasalo, 2003).

2 INDUSTRY DYNAMICS

In this anthology the focus is on the competition between big players in forest industries. Still, the forest industry is combined by a number of players in global terms, most of them being small and medium sized companies. This is evident especially if we look at the forest industries as a whole, bringing for example sawmills into the picture (Alajoutsijärvi, Holma, Nyberg, & Tikkanen, 2005). However, also within the paper and pulp industries a number of small and medium sized companies exist, which can be detected from the database compiled by the authors (See Table 1.1 – more information about the database in section “Data”). For example, at the beginning of the 20th century there were way over 4 000 paper and pulp producers in the world. By the end of the century this figure dropped below 2000.

Though the forest industry sector, especially the paper and pulp production sectors, seem to have concentrated significantly, the concentration is still lagging behind many other lines of businesses. For example, in 1992 the top-five paper companies produced one-fifth of the total paper production, whilst in the car-industry the same share was almost 60 per cent (Diesen, 1998). The ten largest European paper industry companies produced less than a third of the total European sales in 1980, whilst by the mid-1990s the share was already around one half. In the United States, the concentration started earlier: the top-ten paper industry companies produced already by the mid-1980s half of the total sales. The number of paper and pulp producing companies decreased in the United States from 641 companies at the beginning of the 1960s to 241 companies by the beginning of the 1980s, due to the mergers and acquisitions (Diesen, 1998; Jokinen & Heinonen, 1987; Moen & Lilja, 2001; Peterson, 1996, 2001; Schybergson, 2001). Also, the growth of average paper production has occurred especially within the largest companies, which can be clearly detected from Table 1.2.

Table 1.1. *Number of paper and pulp companies and domestic and foreign production units in population.*

<i>Year</i>	<i>Number of companies</i>	<i>Number of Production units</i>	<i>Domestic Units</i>	<i>Units Abroad</i>
1910	4040	..	..	..
1950	3271	3372	3341	30
1974	2781	2900	2844	56
2000	1772	2103	1907	198

Sources: Database of Paper and Pulp companies of the world compiled by the authors. The database is available at: <http://www.cc.jyu.fi/~jaojala/>. More information about the data used in section “Data” below.

Table 1.2. *Concentration of production: per cent share of paper production by top-10 and top-100 companies from the 1000 leading paper producers in 1950, 1974, and 2000.*

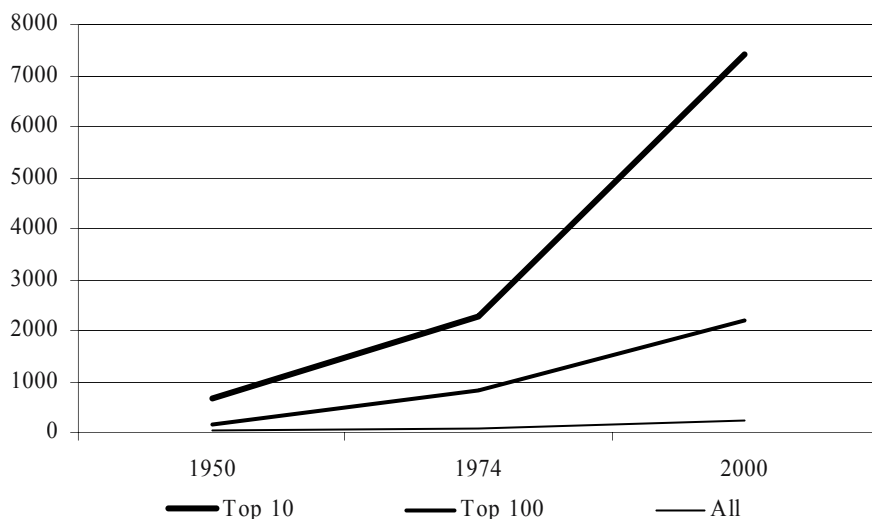
	<i>Top 10</i>	<i>Top 100</i>
1950	26	67
1974	16	60
2000	24	72

Sources: See table 1.1.

However, if we look at the concentration on the global level, the picture is not as clear as in the case of Western economies. Already in the early 1950s the top ten paper companies produced one fourth of the combined production of the thousand leading firms (Table 1.2). This figure is equal to the situation in 2000. Furthermore, our data suggests that the paper industry somewhat fractured from the 1950s up to the mid-1970s, and then, concentrated again during the past couple of decades. Furthermore, the share of the top one hundred companies' production from the top one thousand has also developed similarly.

The forest industries have been on the long run one of the fastest growing lines of business. Whilst at the beginning of the 20th century below ten million tons of paper was produced, in 1950 the figure was already 43 million tons and in 1995 around 260 million tons. Pulp production has increased correspondingly (Diesen, 1998; Huolman, 1992). The increase in paper production is due to the growth of the companies. At the beginning of the 20th century a paper company produced on average around seven thousand tons of paper annually, whilst the number in 2000 was already 235 thousand tons. The growth is even faster, if we look only at the major producers (Figure 1.2). This evolution has been due to both organic growth and to mergers and acquisitions.

The forest industries have been throughout the 20th century a mixture of big players that have even further concentrated, and a number of small and medium sized companies which have been important local actors. This can be also detected from the amount of internationalisation of production (Table 1.1): even in 2000 only around ten per cent of the companies had production units abroad. Still, the internationalisation has been rapid, since this percentage was below one in 1950 and around two in 1974. Internationalisation has been even concentrated in geographical domains: there has been only a limited amount of internationalisation e.g. between North America and Europe (Sajasalo, 2003).



Sources: See Table 1.1.

Figure 1.3. Average annual paper production in the top-10 and top-100 companies in 1950, 1974, and 2000, compared to average production in all companies in population (1000 tons).

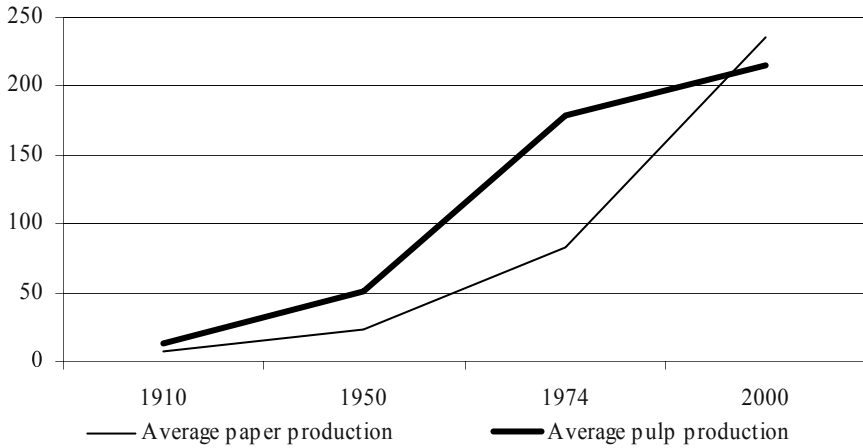
Vertical integration is a typical feature in the forest industries (Huolman, 1995; Ohanian, 1994). In many cases sawmilling companies have moved forwards in the production chain and started to produce pulp, and later on also paper. Especially the number of companies producing only pulp has decreased significantly during the latter part of the 20th century. They have also moved the centre of production towards more valuable paper products. For example, in 2000 out of the whole population of 1772 firms only 75 were producing solely market pulp⁴, 93 out of 2782 in 1974, and 176 out of 3271 in 1950 (see also Table 1.3). Especially after the mid-1970s the average paper production grew more rapidly than the average pulp production (Figure 1.4). Also this indicates, first, the concentration on paper production, but also, secondly, the technological development in paper industries, namely, the diminishing need to use pulp as raw material.

Table 1.3. Type of production in company population, number of companies.

	Paper production	Pulp production
1910	3485	311
1950	3089	543
1974	2661	419
2000	1677	416

Sources: See Table 1.1.

⁴ Though, there are a number of companies of which we do not know their type of production.



Sources: Database compiled by the authors. Number of companies from which data is available: 1910: 881 (paper) and 123 (pulp); 1954: 1121 (paper) and 252 (pulp); 1974: 1673 (paper) and 302 (pulp); 2000: 1285 (paper) and 342 (pulp).

Figure 1.4. Average paper and pulp production per company in 1910, 1950, 1954, and 2000 (thousand tons/year).

Most of the studies dealing with the global forest industries concentrate on only the companies in Western Europe and North America (e.g. Boothman, 2000; Heinrich, 2001; Moen, 1998; Peterson, 1996; Sajasalo, 2003; Toivanen, 2004 – See also, however, e.g. Minami, 1977). The company population, however, suggests that a wider perspective is needed when dealing with this line of business (Table 1.4). Though the European and North-American companies are dominating, both in size and number, the paper and pulp production (Figure 1.1), especially the growth in Asia and Latin-America has been significant. Also, certain South-African companies (such as Mondi International and Sappi) and Australasian companies (like Amcor and Carter Holt Harvey) have been among the leading forest industry firms both in terms of production output and turnover.

In this anthology, again, we concentrate on only North American and Nordic – to be precisely Finnish and Swedish – companies. The rationale for this can be detected from Figure 1.1. The North-American, namely U.S. and Canadian, companies have dominated the paper and pulp industries throughout the 20th century. However, during the last decades of the century the Nordic companies equalled their North American competitors – not only in terms of production, but also in productivity and profitability (Lamberg, 2005; Lamberg & Laurila, 2004; Lamberg & Ojala, 2005). Though, still in 1993 North American companies produced about 38 per cent of the world total paper and board production, whilst the Western European companies produced 26 per cent. However, especially Nordic producers concentrated on

products requiring a higher degree of processing (Diesen, 1998). Therefore, the key question in this volume is to find the explanations for this development.

Table 1.4. *Geographic allocation of the companies in population.*

	<i>Europe</i>	<i>North America</i>	<i>Asia</i>	<i>Australasia</i>	<i>Latin- America</i>	<i>Africa</i>
1910	2980	929	39	4	83	5
1950	1971	584	570	9	116	21
1974	1548	414	515	10	255	39
2000	763	324	497	10	152	25

Sources: See Table 1.1.

2.1 Technology change

The technology development within the paper industry can be roughly divided into: 1) products; 2) processes; 3) supportive areas/production (e.g. automation, chemistry); 4) other technological development (including corporate organisation). Traditionally, the development of products and the organisation have been the sphere of the forestry companies themselves, whereas the processes and supportive areas have been the domain of the machine and equipment producers (Airaksinen, 1988; Alajoutsijärvi, 1996; Jokinen & Heinonen, 1987).

Paper industry technology has generally developed in small steps (Cohen, 1984; Landes, 1969; Laurila, 1998; Magee, 1997; Mokyr, 1990; Stier & Bengston, 1992). Excluding automation the amount of high tech equipment within the industry is fairly low – even the basic technological structures have not developed for decades. For example, the oldest paper machines in use in Finland in the early third millennium were over 100 years old. However, at the same time the size of the paper machines, as well as their production capacity, productivity, and efficiency have risen enormously. The maximum speed of the paper machines has increased from 200 meters per minute at the turn of the 20th century, to over 1800 meters per minute a century later. At the same time the maximum breadth of the machinery has grown from three meters to over nine meters (Airaksinen, 1988; Diesen, 1998; Huolman, 1992, 1995).

Characteristics of the mature industries, such as the paper and pulp industry, are the scale advantages within the productivity and gross incomes gained through investments. There is, however, a divergence between different companies and production plants. As Lundberg (1972) has proved, in Swedish pulp industries the productivity within the “top” plants from the 1940s to 1960s was twice as much as it was within the “average” plants. Productivity growth within these plants was based on the technological advantages and to the larger size of the plants. Within the smaller plants the productivity growth was, according to him, more or less based on the structural changes in the national economy (Lundberg, 1972).

Typical for the paper and pulp industries are huge investments in production technology. Thus, the production is typical of the manufacturing industry in which economies of scale is a decisive factor to be exact, the scale effects acquired by

production technology and by the concentration process. Both technology and concentration are closely interlinked with the decisions made by the companies in the past. Thus, the industry is highly path dependent: the companies chose their paths for decades to come within e.g. the technology decision processes (David, 1986, 2001; Dosi, 1997). This has both negative and positive side effects. On the one hand, it enables long term planning and commitment. On the other, “wrong” investments made in the past can harm the companies’ development for the future decades to come. There are a number of examples of both successful and unsuccessful investments. For example, in the case of the Schaubman Corporation the over investments in the 1970s and 1980s led to the break up of the whole company (see: Ojala and Pajunen, in this volume).

Investments within the paper and pulp industries have been growing in size all the time due to the expansion in size and capacity of the machinery. The maintenance and renewal investments of the machinery in use have grown in conjunction with the company’s growth. From the total post war investments within the four largest Finnish paper industry companies 53 per cent were made during the 1990s, though only a limited number of new machines or other production facilities were constructed during the last decade of the 20th century (Lamberg & Ojala, 2001; Vuori & Ylä-Anttila, 1992).

Following the concentration process, also the number of machines per firm has grown – especially within the largest corporations (Table 1.5). In the case of all the companies in the population, the level of production per machine has grown around 20 fold from the beginning up until the end of the century and within the top one hundred companies the average annual production per machine has grown six-fold from the early 1950s up until the end of the century. Still, in the whole population of companies the typical company has only a couple of small machines. Also, the increased usage of recycled fibre has proved to be disadvantageous to the traditional economies of scale in paper industries. Namely, the nearness of the raw material base in e.g. large cities has created a new concept called the “minimill” (Diesen, 1998; Turner & Deadman, 1983).

Table 1.5. *Average number of paper machines, top 10, top 100 and all companies in population.*

	<i>Top 10</i>	<i>Top 100</i>	<i>All</i>	<i>N</i>
1910	..	..	2.3	2859
1950	19.6	8.1	3.0	2018
1974	32.7	17.0	3.4	2078
2000	38.7	17.6	3.7	1242

Due to the growth in machinery there has been a significant increase in productivity, both in terms of the volume and values produced by one worker, which can be detected from the case-analysis in this volume (see also Diesen, 1998). This is not related only to the growth of single machines, but also to the automation of the processes and to the rise of vertically integrated paper producing combines that include both pulp and paper production.

Besides the obvious technological development in paper machinery, however, also other technological changes have occurred during the 20th century, which in their part can explain the changes in the whole industry. Though a typical feature of the paper and pulp industry has been the rather gradual technological accumulation rather than major leaps (Cohen, 1984; Magee, 1997), still also certain major changes can be detected from the 20th century (Kettunen, 2002; Lorant, 1967; Toivanen, 2004). These changes include, for example, the change from sulphite to sulphate pulp, the introduction of machine coated paper grades, thermo and pressure mechanical pulp, and increased usage of recycled fibre (Diesen, 1998; Kettunen, 2002; Laurila, 1997, 1998; Toivanen, 2004). Furthermore, as in other industries, also a lot of organisational changes have taken place, including technological development, such as the introduction of computers and management information systems (e.g. SAP).

Furthermore, also research and development has gained more importance in forest industry companies, though traditionally the share of research and development in the paper industries turnover has traditionally been quite low – in Finland the paper and pulp industry companies spent on average only 2.2 per cent of their turnover on research and development in 1989 (Vuori & Ylä-Anttila, 1992). This is largely related to the fact, especially in the Finnish case, that the processes and products are usually developed outside the firms, especially in the jointly owned Central Laboratory, Universities, and in companies producing production technology (Alajoutsijärvi, 1996; Hamberg, 1963; Michelsen, 1993). Though, on occasion, accusations have been made in Finland that the cooperation between the Central Laboratory and the research units within the individual companies are not as close as they should be.⁵

The forest industry is cyclical by nature due to the fluctuation in prices for end products and raw materials. Economic factors, growth of population, and level of industrial production have all had an impact on the forest industries on the whole and for the paper and pulp production in particular. Especially from the 1970s onwards, as Diesen suggests, additional factors such as development of office technology and advertising expenditures have shaped the limits of what is possible for the industries. More emphasis has been put on, for example, in the Nordic countries on office and coated magazine paper production. In 1995 around 45 per cent of paper consumption was used for communication (newsprint, printing, and writing papers, 40 per cent for packaging, and 15 per cent for miscellaneous (hygienic, health care etc.). There seems to be a strong correlation of GDP per capita and paper consumption, though the growth of the global paper consumption has exceeded the GDP growth since 1950 by a factor of 1 – 1.5 depending on time, period and region. Also sawn timber is highly vulnerable to the fluctuations because the demand correlates with the fluctuation within the construction industries (Diesen, 1998; Halme, 1955; Huolman, 1995).

Thus, the ‘big picture’ of the industry seems to be rather clear including the incremental development in technology, strong correlation with the macro business

⁵ As did the strategy committee within the Kymmene Corporation during the early 1980s. KC, Minutes of the strategy committee 20th December 1983.

cycles and the typical demography of a mature industry. What remains interesting, however, are the development paths of the individual firms which have led to either survival or death, success or failure. This creates the primary motivation for this book as a whole.

3 METHOD FOR THE BOOK⁶

3.1 Research Design

The unifying methodological theme of the book is the qualitative case analyses and the comparisons between them. The case study approach has been defined as a method in qualitative research. However, it might be more appropriate to simply state that it is a relevant choice to analyse phenomena longitudinally in contrast to cross-sectional research designs (Stake, 2000).

According to Yin's original definition, a case study has a contemporary dimension and the triangulation (usually) includes interviews or observation among the use archival and documentary material. From this point of view, there is no such phenomenon as an "historical case study," but case studies or histories (Yin, 1989). It is evident that this definition is problematic although the principle of triangulation, for example, is rather similar to the traditional critical assessment of sources in history (Bentley, 1999).

The reason why the historical analyses in this book are defined as historical case studies is grounded on existing theoretical literature. In history, the primary method is inductive inquiry whereas in the cases of this book the research is both deductive and inductive (Pettigrew, 1997). Thus, using other popular definitions of case study method, the cases in this book can be defined as extended case studies, plausibility probes or even crucial cases. The extended case study "...deals with a sequence of events, sometimes over quite a long period...the processual aspect is given emphasis." Plausibility probes are case studies used "...specifically to test interpretive paradigms which have been established either by previous case studies or by other procedures." Crucial case studies give possibilities to create propositions or even to test them (Mitchell, 2000).

The design of a case study can be either loose or tight depending on how much priori assumptions and pre-structuring is made (Miles & Huberman, 1994). In this book, the explicit conceptual frameworks and systematic methodology makes the approach pre-structured and tight. The rationale for this choice is that in previous studies on the Finnish paper and pulp industry the design has been based on more heuristic descriptive aspects and visualization of strategic decision-making situations (Näsi, Lamberg, Ojala, & Sajasalo, 2001; Näsi, Ranta, & Sajasalo, 1998). Furthermore, in other Scandinavian studies analyzing the paper and pulp industry, more inductive methods have led to rather similar research results to those of the recent Finnish studies (Melander, 1997, 2005; Moen, 1998; Peterson, 1996, 2001).

⁶ Earlier version of the section was published in Juha-Antti Lamberg, *Strategic Action and Path Dependence: Profiles and Archetypes of Competitive Behaviour in a Global Industry* (2005).

Thus, it is expected that the tight approach improves both the validity and reliability of the study.

3.2 Firm Sample

The main idea of the book is to compare forest industry firms originating from the U.S. and Scandinavia. As the Norwegian Norske Skog has been analyzed extensively in the recent literature (Moen, 1998; Sæther, 2004), we decided to concentrate on the U.S., Swedish and Finnish firms. In this group, U.S.-based firms represent the traditional hegemony in the industry. On the contrary, the Finnish and Swedish firms essentially were the most winners of the 1980—1990s. We followed two specific decision-making criteria when building the sample. First, we concentrate only on the originally (i.e. before 1970s) diversified business-to-business companies and thus omitted the business-to-consumer and specialized niche firms. Second, we included firms with different governance structures. Thus, our sample covers the largest diversified U.S., Finnish and Swedish firms but also more randomly sampled family firms. In making the decision of which family firms were chosen, the personal interests of the researchers and access to relevant data primarily dictated it. What needs to be emphasized is that many of the largest firms were originally family-owned. So the sampled family firms deviate from this group as they have retained their governance structure throughout the period. Finally, some of the firms under scrutiny were acquired before the end of the 1990s. These firms represent a less successful group of forest industry firms and should strengthen the validity of the sample. The firm sample is described in Table 1.6 and below.

Table 1.6. *Company sample.*

	<i>Nationality</i>	<i>Founding year</i>	<i>1999 turnover (billions dollars)</i>	<i>1974 ranking (paper sales)</i>	<i>1999 ranking (paper sales)</i>	<i>Original focus</i>	<i>Current ownership structure</i>
International Paper	US	1898	25	1.	1.	Paper	Public
Mead	US	1881	3.8	8.	17.	Paper	Public
Weyerhaeuser	US	1900	12.2	4.	12.	Lumber	Public
Georgia Pacific	US	1927	20	5.	10.	Lumber	Public
Gulf States Paper	US	1884	0.5	..	..	Paper	Private
Enso-Gutzeit (Stora-Enso)	FIN	1918	11	32.	2.	Timber	Public
Kymmene	FIN	1904	..	56.	..	Paper	Public (acquired by UPM)
UPM	FIN	1920	8.8	53.	5.	Paper	Public

Table 1.6 (cont.)

Table 1.6 (cont.)

	<i>Nationality</i>	<i>Founding year</i>	<i>1999 turnover (billions dollars)</i>	<i>1974 ranking (paper sales)</i>	<i>1999 ranking (paper sales)</i>	<i>Original focus</i>	<i>Current ownership structure</i>
Metsäliitto	FIN	1934	4.5	93.	13.	Lumber	Co-operative
Ahlström	FIN	1851	2.7	58.	54.	Timber	Private
Schauman	FIN	1883	..	94.	..	Timber, Plywood	Private (acquired by Kymmene)
SCA	Sweden	1920s	9.1	28.	10.	Pulp	Public
MoDo	Sweden	1872	2.1	43.	25.	Timber	Private

3.2.1 International Paper

International Paper was founded in 1898. Being originally a newsprint producer, it currently has significant global businesses in paper and paper distribution, packaging and forest products, including building materials. The company has operations in nearly 40 countries and employs approximately 83,000 people worldwide and exports its products to more than 120 nations. In terms of overall sales, International Paper remains the world's largest forest industry company. (www.internationalpaper.com).

3.2.2 Mead

Mead's roots trace back to the year 1846 as the Ellis, Chafin and Company was founded in Ohio. In 1904 banks had to step in, but the company was incorporated again in 1905 as the Mead Pulp and Paper Company. In 2002 Mead merged with Westvaco thus creating the MeadWestvaco Corporation (www.meadwestvaco.com). In 2000 Mead had 15,000 employees and net sales of 4.7 billion dollars. Mead was a public company primarily engaged with production of coated and uncoated papers and specialties, office products, coated kraft board and multiple packaging systems for bottlers. In its history, the company also produced pulp, lumber, corrugated packaging, data services, and was involved in foundry and rubber businesses and many kinds of distribution

3.2.3 Weyerhaeuser

Weyerhaeuser (www.weyerhaeuser.com) is a public company and at the end of 2004 it had 53,600 employees. In 2003 it had net sales of 19.9 billion dollars, and so it was the 5th largest American pulp and paper company. Weyerhaeuser was founded in 1900 in the State of Washington as the Weyerhaeuser Timber Company and initially it was primarily engaged in land ownership. Currently, Weyerhaeuser's businesses include growing and harvesting of timber, wood products manufacturing and distribution, pulp, paper, containerboard and packaging production, and real estate development and construction.

3.2.4 *Georgia Pacific*

Georgia-Pacific (www.gp.com) is a public company, and in December 2004 it employed approximately 55,000 people in North America and Europe. In 2003 the company had net sales of 20.3 billion dollars, which made it the second largest American pulp and paper company. The company was founded in 1927 in Georgia as the Georgia Hardwood Lumber Company, and started as a wholesale lumber yard. Today, Georgia-Pacific produces tissue, disposable tabletop products, pulp, paper, packaging, building products and related chemicals.

3.2.5 *Gulf States Paper Corporation*

Gulf States Paper Corporation is a privately held company that currently employs more than 2,900 employees in 10 U.S.-states. The company is the third largest supplier of SBS folding boxboard and one of the top 10 folding carton manufacturers (www.company.monster.com/gsp) in the U.S. In 1998, the company's annual revenues were approximately \$500 million. Founded in 1884, the company has experienced slow but steady growth over its nearly one hundred and twenty years of existence. The company currently consists of five distinct operating divisions: 1) Natural Resources, 2) Wood Products, 3) Pulp & Paperboard, 4) Paperboard Packaging, and 5) Business Solutions.

3.2.6 *Enso-Gutzeit (Stora-Enso)*

Enso-Gutzeit originates to the sawmill founded by the Norwegian Gutzeit family in 1872. It was acquired by the state of Finland in 1919 and merged with Swedish Stora Kopparbergs Bergslags Aktiebolag (STORA) in 1998. Stora Enso (www.storaenso.com) is an integrated paper, packaging and forest products company producing publication and fine papers, packaging boards and wood and products. In 2005, Stora Enso has over 45 000 employees in more than 40 countries on five continents. Stora Enso's shares are listed in Helsinki, Stockholm and New York.

3.2.7 *Kymmene*

Kymmene Corporation was for a long time the largest, private industrial enterprise in Finland and during the early 20th century the largest paper producer in the Nordic countries. Kymmene, founded in 1904, concentrated on, unlike the other Finnish forest industry companies during the early part of the 20th century, mainly paper production, and not on other related production. However, during the latter part of the century the company diversified rapidly and into unrelated areas. It owned e.g. metal industries, petro-chemistry and finally, was merged in the early 1980s with Strömberg as a conglomerate with two dominant industrial branches: metal (mainly electric and machinery) and forest industries. This merger was a failure, and soon the corporation was turned around and it concentrated again on the core competencies, namely, paper and pulp production. The early 1990s depression hit

the company's main businesses hard. In 1995 Kymmene was merged with UPM as UPM-Kymmene.

3.2.8 UPM

United Paper Mills was founded in 1920 by merging together three rather small paper producing companies. UPM was, thus, right from the beginning a paper producing firm, unlike many other Finnish paper producers which had integrated their production from sawmills or pulp to paper during the 20th century. Especially with extensive investment in new production facilities UPM grew to be a major player in Finnish forest industries by the mid-20th century. Through the mergers and acquisitions, first in its homeland, and second internationally, UPM became one of the leading companies in international forest industries during the 1990s.

3.2.9 Metsäliitto

Metsäliitto was founded in 1934 to represent the interests of the forest owners in the lumber market of Finland. After the Second World War Metsäliitto was re-organized as a cooperative. Simultaneously, it started to expand into timber trade and pulp production. Currently, the Metsäliitto corporation is a diversified conglomerate. The independent companies partly owned by Metsäliitto operate in the paper and pulp industry, sawn timber and raw material markets. Metsäliitto has concentrated on European markets yet also has activities in North America and South America. Metsäliitto has over 30,000 employees.

3.2.10 Ahlstrom

With net sales over two billion and almost 10,000 employees, Ahlstrom was ranked among the top 25 Finnish firms in 2000 (<http://www.ahlstrom.com>). Founded in 1851, Ahlstrom has long been one of the largest industrial corporations in Finland. Ahlstrom's first paper mill was founded in 1907 (Kauttua) and its first pulp mill in 1917 (Varkaus). Though the company has diversified into several sectors, it has mainly operated within the wood-processing cluster. Today the company is a leader in high performance fiber based materials serving niche markets worldwide. At the moment, the company is going through a profound structural change: the company was split into three parts in June 2001. According to the strategic plan of Ahlstrom Corporation, the ownership share of the family members will be diminished over the next several years.

3.2.11 Schauman

The Finnish pulp and paper producing company Schauman ceased to exist in 1987 when it was merged with Kymmene Corporation. Today, the production plants of Schauman are part of the UPM-Kymmene Corporation, one of leading paper producers in the world. During its last operating year (1987), Schauman's net sales

were approximately 500 million euros and the company had 7,000 employees. Schauman, founded in 1883, concentrated during the early 20th century on saw milling and plywood production. It entered the pulp industry in the 1930's and paper production in the 1960's. The company went through a structural change in the 1970's, becoming one of the most essential (market) pulp producers in Finland. The pulp production capacity of Schauman in 1985 was the third largest in Finland composing approximately ten percent of the total.

3.2.12 SCA

SCA is a public company currently employing approximately 40,000 employees in more than 40 countries (www.SCA.com). SCA was founded in the late 1920's as an attempt to build a monopoly in the pulp industry. The famous match monopolist Ivan Kreuger was not able to carry the project through and following his death and the Second World War, it was not until the early 1950's before SCA was operating as one united company. In 2001, the annual revenues were SEK 82 billion (approx. 8 Billion USD). SCA produces and sells absorbent hygiene products (49% of sales), packaging solutions (35%) and publication papers (14%). The company has its headquarters in Stockholm, Sweden.

3.2.13 MoDo

MoDo was founded in 1872 by the Kempe family. The company, although publicly listed, was controlled by the same family until 1990. As a result of a takeover attempt, the family was forced to sell their majority share of the company in 1990. At that time, the company's major operations were sawn timber, office paper, newspaper, pulp and folded cardboard. At the end of 1990, the company's core business was merged with SCA's office paper and a reborn company, MoDo Paper, went public. MoDo Paper was at that time focusing on pulp and office paper. In 2001, MoDo Paper was merged with M-Real, a company controlled by the forest owners cooperative in Finland.

3.3 Research Strategy

The methodological idea in the study is to analyse strategy processes using qualitative data: reports, correspondence, published material and literature. Our research strategy is to exploit multiple strategies from Langley's (1999) set of different research approaches. Furthermore, we use descriptive quantitative analysis to complement the process analysis. Thus, we engaged in intensive methodological triangulation in order to enhance the validity of our interpretations.

Table 1.7. *Research strategies and their purpose for the study.*

<i>Research Strategy</i>	<i>Data</i>	<i>Level of Simplicity</i>	<i>Method</i>	<i>Purpose(s) for the study</i>
Historical Analysis (Langley, 1999)	Event	Low	Construction of detailed story from the raw data.	1) To include contextual element in the strategy analysis; 2) to help to understand intra-organizational decision-making processes; 3) to include individual actors in the analysis.
Quantification (of process data) (Langley, 1999)	Event	High	Systematic listing and codification of qualitative incidents according to predetermined characteristics.	1) To facilitate inter-organizational comparisons; 2) to clarify organizational strategy paths.
Quantitative analysis	Financial	High	Descriptive statistical time-series analysis of crucial economic variables.	1) to facilitate comparisons; 2) to anchor strategic patterns to economic realities; 3) to include the totality of strategic actions in the analysis (indirectly via investment data).

3.4 Historical analysis

Historical analysis is the starting point for all cases. The aim is to include contextual factors in the analysis through realistic description (Chandler & Salsbury, 1971; Chandler, 1962; Pettigrew, 1985). According to Collingwood's (1956) classic definition, history is re-enactment of past thought in the researcher's own mind. Furthermore, he divides the past into the inside and outside of events. Hence, for example a merger in the paper industry is the outside of that event: finding that the merger has happened. The inside of the event has happened only in the actors' thoughts. Together, outside and inside of an event constitute an action that is the unity of events. The researcher's duty is to think him into this action: "to discern the thoughts of its agent." (Collingwood, 1956)

The basic method of traditional historical analysis has been to describe the outside of the events and to try to understand the motives of the actors' through exploration and continuous reading of archived texts (Bentley, 1999). Historical narrative as a "perceived sequence of non-randomly connected events" is the most convenient style of expression for this kind of analysis (Roth, 1995; White, 1987). For this study historical description and interpretation is an essential part of the methodological set because it helps us to understand the motivations, i.e. the inside events, of organizational actors.

3.5 Strategic events analysis: method to codify process data

The second part in the methodological tool-set is a systematic codifying model that gives the possibility to systematically analyse and compare historical strategies. From Langley's (1999) research strategies, it can be defined as a quantification strategy. From the theoretical point of view, event data analysis is an operationalisation method for the path dependence argument giving possibilities to evaluate causal relations between historical events.

Quantification strategies have been widely used in event data analysis in organization studies (Hannan & Carroll, 1981; Hannan & Tuma, 1979; Hannan & Carroll, 1981; Tuma & Hannan, 1979), political science (Rummel, 1979), and during the 1980—1990s in strategy research as well (Miller & Chen, 1994; K. Smith et al., 2001). The bases for all quantification-based analysis are historical events that are arranged according their sequences. This chronological set of events can be coded by using a set of dichotomous variables. The idea in coded event data is that it can be analysed by using different quantitative methods, and that these systematic event series can be used in comparative studies (Van de Ven, 1990; Van de Ven & Poole, 1995).

An event can be defined as consisting “of some qualitative change that occurs at [a] specific point in time ... [furthermore] ... change must consist of a relatively sharp disjunction between what precedes and what follows” (Allison, 1984). The most efficient way to study events is to collect event history data and create a longitudinal record of when events happened to (in this case) firms. Hence, the essential concept in the strategic action analysis is a *strategic action* (Grimm & Smith, 1997) crucial strategic decision or change that has influenced the historical development of the company.

A starting point for the analysis is the definition of a strategic action. We follow Miller who has defined strategic actions as “... [including] major facilities expansions, mergers and acquisitions, strategic alliances, and important new products or services [...] strategic actions involve a larger expenditure of resources, a longer time horizon, and a greater departure from the status quo than do tactical actions” (Miller & Chen, 1994). Therefore, the importance of an action can be evaluated by first, its economic importance (from resource allocation perspective), secondly by its innovative dimension and thirdly and most importantly, by its network effect (Eriksson et al., 2000).

Following the aforementioned guidelines, the case-specific databases are focused on strategic actions. It is important to emphasize that strategic does not necessarily mean large only in financial terms. For example, a small event that started the historical diversification process in the 1920s might from the perspective of this study, be far more important than a new paper mill in the 1990s (See examples e.g. in Lamberg, 2001b; Ojala, 2001a). In addition, the emphasis is both on opening and closing actions. Hence, for example renovations of paper mills are rarely considered as strategic actions. This is also a major difference in comparison to the majority of earlier studies in competitive dynamics, which have concentrated primarily on opening actions (Dranikoff, Koller, & Schneider, 2002; Ferrier, 2001; Hambrick et al., 1996; Näsi, 1996).