

World Forests XVII

Juha-Antti Lamberg
Jari Ojala
Mirva Peltoniemi
Timo Särkkä *Editors*

The Evolution of Global Paper Industry 1800–2050

A Comparative Analysis

 Springer

The Evolution of Global Paper Industry 1800–2050

WORLD FORESTS

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Preface

We began this book almost a decade ago, and now it is completed. First, we gratefully acknowledge the contributions of each individual writer to the scientific content of the book. Second, we thank the Academy of Finland, the Finnish Funding Agency for Technology and Innovation, Forestcluster Ltd, University of Jyväskylä, Aalto University, and numerous other organizations for financial and organizational support. Third, we express our gratitude to the host of research assistants helping us during the process. Aino, Miiikka, Mikko, Esa, Lauri and others – thank you! Fourth, we received valuable comments from Peter Murmann, Matti Palo, Jyrki Kettunen, participants of three dedicated workshops, and our colleagues in numerous universities and countries. Fifth, our language editor, Virginia Mattila did magnificent work during the final stage of the process—as did Ville Korhonen at the publishing unit of the University of Jyväskylä in typesetting the volume. Finally, we would like to thank Springer *World Forests* series editors Matti Palo and Jussi Uusivuori, and especially Melanie van Overbeek, Ria Kanter, and Valeria Rinaudo from Springer.

The Editors

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Chapter 1

Research on Evolution and the Global History of Pulp and Paper Industry: An Introduction

Juha-Antti Lamberg, Jari Ojala, Mirva Peltoniemi, and Timo Särkkä

1.1 Industry Life Cycle

This book presents a comprehensive analysis of the birth, growth, maturity, and finally the decline of the mechanized pulp and paper industry from its inception in the early nineteenth century Europe to its current situation and future prospects in developing markets in Southern America and other regions. The underlying assumption in the economic history of industries is the deterministic nature of the industry life cycle. That is, industries are assumed to follow a specific life cycle characterized by stages of nascence, growth, maturity, and decline apparent in firm numbers, production volume, and technological activity. At a high level of abstraction, the evolution of any industry is a function of changes in product market demand, technology, the surrounding institutional environment, and organizational solutions. A new industry emerges as a result of a technological opportunity that encourages the entry of a large number of firms. Discontinuities may appear, such as a change in the competences required for producing the product, a radical change in the physical product,

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or a sharp increase in the price-performance ratio (Ehrnberg 1995). This phase is followed by an era of increased entry and radical innovations, which form alternatives that compete for consumer acceptance (e.g., Abernathy 1978; Agarwal and Bayus 2002). As the winner, that is, the dominant design (e.g., Anderson and Tushman 1990; Murmann and Frenken 2006; Suarez 2004), emerges, a shakeout in firm numbers takes place (e.g., Klepper and Miller 1995; Willard and Cooper 1985). Thereafter, the industry shifts to an era of incremental change and stagnation in firm numbers (e.g., Abernathy 1978; Kim and Pennings 2009; Roy and McEvily 2004).

Overall, the main explanatory mechanism in the industry life-cycle literature is technological change and size advantage in R&D (Klepper 1996). As the dominant design emerges, many firms increase their production volumes to serve the growing market. When the overall production exceeds demand, a shakeout follows. At this point, large firms are at an advantage because they can spread their R&D costs over a larger production volume. The cost spreading effect is especially strong in process R&D. The shift in emphasis from product to process R&D that occurs after the emergence of the dominant design therefore favors the larger firms. The research on firm survival following Klepper's theoretical framework has concentrated on the effects of entry timing (e.g., Agarwal and Bayus 2004; Dowell and Swaminathan 2006), pre-entry experience (e.g., Buenstorf and Klepper 2009; Cattani 2005), and innovation (Cantner et al. 2009; Cefis and Marsili 2006). Such empirical works have demonstrated consistently that early entrants, experienced firms and entrepreneurs, and innovative firms have better chances of survival (see Peltoniemi 2011 for an extensive review). In addition to accumulated competence, early entrants and experienced firms benefit from their larger size compared to recent and inexperienced entrants at the outset of the shakeout.

Evolutionary scholars, on the other hand, have suggested that evolutionary processes (a) are characterized by a large turnover of firms (total number of entries and exits over time) and (b) that this process is needed for the selection of successful firms. This hypothesis has also been verified in a number of empirical contexts (Carroll and Swaminathan 2000; Dobrev et al. 2001). In a similar vein, many scholars assume that the characteristics of the institutional environment are a necessary explanation for the emergence and destruction of industries. For example, research in new political economics (North 1990) perceives institutions as a mechanism that directs investments and activities. In the same spirit, authorities in the national innovation systems literature (e.g., Nelson and Winter 1982; Nelson 1993) have found that the innovation environment (basically regulative system, organization of research and development, etc.) may dramatically affect the distribution of large firms among different countries.

Like any other theoretical model, the industry life-cycle explanation reaches its limits as complexity increases. An important source of complexity in the global economy is the similarities, differences, and interactions between different regions within a particular industry. Even if the abovementioned literatures are combined, we still lack an understanding of two key issues in industry evolution: (a) To what extent are evolutionary explanations geographically and temporally universal, causing similar patterns in different types of countries (cf. Mowery and Nelson 1999), and

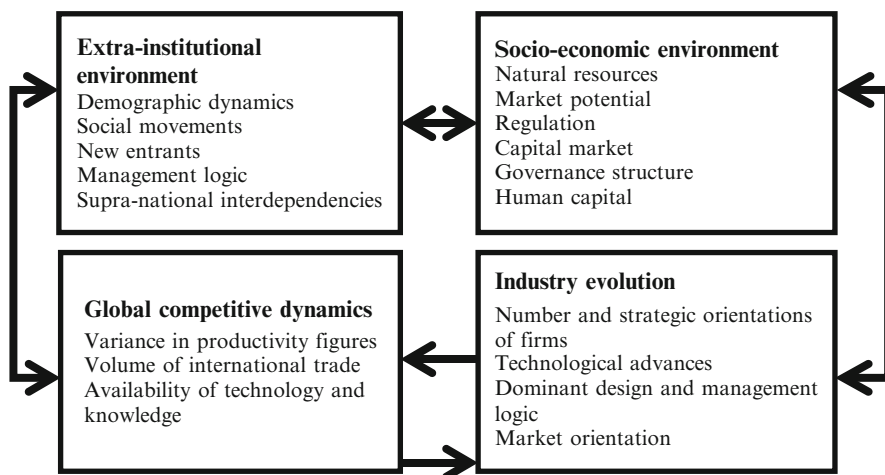


Fig. 1.1 Conceptual framework (Source: Modified from the model in Lewin et al. 1999)

(b) what kinds of causal relationships are there between industrial decline in one geographic region and rise in another (cf. Jarvinen et al. 2009; Murmann 2003)?

Building on earlier work in evolutionary research (Lewin et al. 1999; Murmann 2003), Fig. 1.1 summarizes on an abstract level how the above factors work in a dynamic interrelationship. First, there are *external* factors exerting influence on changes in industry structure, production volume, and technological solutions. The *national socioeconomic* environment plays a role in terms of the availability of raw material and energy, market potential affected by demographics and literacy, regulation and the availability of capital, and educated workforce. The *global competitive dynamics* come into play through international trade, which emerges early in paper products. Moreover, technology is transferred from one region to another, and there is variation in productivity across countries. Finally, the *extra-institutional environment* drives changes at the macrolevel: social movements, such as environmentalism, have far-reaching effects on industry evolution, and the industry-specific management ethos may drive important changes in terms of the attention paid to various competitive arenas, such as innovations, demand characteristics, and technological improvements.

The model embraces three major themes including (1) industry structure and production volume; (2) technology, raw materials, and products/markets; and (3) regulation, government policy, and culture. Focusing on these broad themes enables us to study three theoretically interesting phenomena. First, we are interested in the international interdependencies in industry structure and the rise and fall of national industries. Second, we aim to shed light on the mechanisms of international fluctuations in technological leadership and the tension between raw material availability and distance to market in determining the competitive advantage of nations. Third, we will discuss the degree of determinism of industry evolution and the degrees of freedom that national institutions have in influencing it.

We approach these questions from a historical perspective. That is, this book focuses on industry evolution in specific countries relative to global industry dynamics. Instead of studying several industries, we examine the global pulp and paper industry. Studying the pulp and paper industry in several countries and geographic regions allows us to achieve important goals. First, historical studies on a large number of countries help to identify what is specific in each industrial history relative to the general patterns explicable by existing theoretical knowledge. Second, rich historical studies are needed to identify the set of factors influencing both the rise and fall of industrial populations. Although we have fairly robust knowledge of such factors at a general level, we do not know what factors are needed in specific historical contexts and how they interact. Third, studying different countries with a shared research agenda enables us to study and compare global industry dynamics with an intensity that is not possible in studies relying on single data sources or econometric methods.

1.2 Forest Industry Research

The factors that potentially influence and retrospectively explain forest industry evolution have received a significant amount of scholarly research attention. Table 1.1 lists the most relevant topics in the research segment broadly focused on forest industry evolution. It is important to note that the themes listed below have a universal characteristic in the sense that although research has focused on specific countries, the theme-specific explanations are relevant across national boundaries. Another genre, which we may refer to as country-specific historical studies, has produced an impressive number of publications that deal practically with all the explanations listed but in limited geographic regions. Recent country-specific histories of forest industries include several doctoral dissertations (Bouwens 2004; Melander 1997; Moen 1998; Peterson 2001; Toivanen 2004), other published research (Ainamo 2005; Alajoutsijärvi et al. 2005; Boothman 2000; Iwai 2003; Iwamoto 2003; Kreiser et al. 2006; Lamberg and Laurila 2005; Palo et al. 2001), and international comparisons (Lamberg et al. 2006; Lehtinen et al. 2004; Palo and Lehto 2012; Palo et al. 2001; Sajasalo 2003; Siitonen 2003).

The first conclusion from the literature review is that the field is fragmented: There are a large number of themes in relation to the amount of published research. Second, there are noteworthy differences in the popularity of the categories. Recently, environmental and ethical issues has been the most popular research theme, followed by operations management, strategy and structure, and technology, capabilities, and innovations. Third, the popularity of certain themes varies over the years. For example, operations management (e.g., supply chain modeling) was popular in the 1980s and 1990s but less so in the 2000s. Conversely, environmental and ethical issues have dominated scholarly discussion since the late 1990s, whereas strategy and innovations can be seen more as emergent themes in the most recent discussion.

Table 1.1 Identifiable research streams relevant to forest industry evolution

	Research themes	Description	Representative citations	Popular topic
Global competitive dynamics	Volume and structure of international trade	Overseas investments, developing economies, global competition	Eronen and Simula (1991), Joutsenvirta and Vaara (2009), Laurila and Ropponen (2003), Sajaso (2003), Siitonen (2003), Waitt (1994)	1990s
	Availability of technology and knowledge	Sourcing, transfer, and absorption of technological knowledge, product innovation, efficiency, technological innovation	Chamberlin and Doutriaux (2010), Das and Alavalapati (2003), Diaz-Balteiro et al. (2006), Stendahl and Roos (2008), Diesen (1998), Hazley (2000), Jonker et al. (2006), Stier and Bengston (1992)	2000s
Industry evolution	Number and strategic orientation of firms	Industry decline, changes in product lines, consolidation, cluster effects, collaboration between industry and society	Arbuthnott et al. (2010), Hienrich (2001), Mei and Sun (2008), Aguilar (2009), Ahola (2006), Christensen and Caves (1997), Jarvinen et al. (2009), Lamberg and Ojala (2006), Melander (1997, 2005, 2006), Ojala et al. (2006), Vihervaara and Kamppinen (2009), Wolf et al. (2007)	1990s and 2000s
	Technological advances	Measuring technological change, modernization, aligning R&D	Berends and Romme (2001), Comstock and Sjolseth (1999), Diesen (1998), Ghosal and Nair-Reichert (2009), Lundmark (2005), Lundmark and Söderholm (2004)	1990s and 2000s
Industry life cycle	Dominant design and management logic	Integration, business units, mergers, supply chain management, production strategies, performance	Jantunen et al. (2009), Mei and Sun (2008), Ohanian (1994), Roos et al. (2001), Shadbegian and Gray (2006), Laurila and Lilja (2002), Lehtonen and Holmström (1998), Lilja et al. (1992), Tainio et al. (1989)	1990s and 2000s
	Industry life cycle	Technological and organizational development, institutions	Hansen (2006), Laurila (1997), Reinstaller (2005), Skippari et al. (2005), Stanturf et al. (2003)	2000s

(continued)

Table 1.1 (continued)

	Research themes	Description	Representative citations	Popular topic
Socioeconomic environment	Industrial relations	Job losses, work processes	Freudenburg et al. (1998), Leppanen (2001)	2000s
Extra-institutional environment	Regulation	Government actions, firm reactions to regulation	Baker (2004), Lanoie et al. (1998), Lehtinen et al. (2004), Palo and Lehto (2012)	2000s
	Social movements	Relationship of regulation and technology development, certification, corporate social responsibility, other environmental, and ethical issues	Barla (2007), Molina (2001), Norberg-Bohm and Rossi (1998), Vidal et al. (2010)	2000s
	New entrants	Potential of new technologies, transformation economies	Jokinen et al. (1994, Laestadius (2000), Solberg et al. (2003)	1990s

Reflecting the generic nature of heavy industries, many of the themes would be the same in the context of any manufacturing industry. The automobile industry, for example, has attracted a rather similar set of topics since the late 1960s, partly reflecting the current challenges faced by the industry and partly the tendencies in the general social sciences literature (Vuori and Piik 2010). Moreover, the specific characteristics of the forest industry in procurement and manufacturing have guided the selection of research topics. Therefore, environmental and ethical issues have gained popularity in conjunction with the rising preoccupation with pollution, environmental regulation, and human interest issues. Most recently, research on environmental and ethical issues has focused on developing countries. This relates to the public discussion and criticism of corporate activities in plantation, forest use, and emissions in these countries. Furthermore, the popularity of operations management issues reflects the traditional manufacturing nature of the industry. In this setting, the industry itself is interested in issues and research results with the help of which the efficiency of paper mills, and the entire value chain, could be improved.

Taken together, the literature focusing specifically on the themes relevant to the evolution of the forest industry reflects the problems and interests relative to the scholars who conduct the research, yet also the changing interests of the stakeholders, including firms, governmental agencies, nongovernmental organizations, and media. As a consequence, many topics have been paid academic attention in terms of published research, yet only the stream focusing on environmental and ethical issues may be seen as constituting an internally coherent research field rigorous enough to catalyze increasing numbers of new studies.

From the perspective of industrial history, the pulp and paper industry is an increasingly attractive research context—not only because it represents a maturing industry in the midst of radical changes but also due to the earlier academic work that has not yet resulted in comprehensive understanding of the historical development on a global scale. To name a few such studies, we mention those by D’Aveni and Ilinitch (1992) on diversification in the forest industry context, by Ghosal and Nair-Reichert (2009) on innovation management, and by Lamberg et al. (2006) on competitive dynamics and firm-specific strategic patterns. These works demonstrate the apparent opportunities in studying forest industry with historical comparative lenses. However, the field still lacks a comprehensive comparative account of industry evolution during the era of modern papermaking. This book therefore fills important gaps in our knowledge about the historical development of the pulp and paper industry and its evolution more generally, especially as a collection of rich historical analyses combined with systematic comparative perspective.

1.3 Research Framework

The number of paper industry firms has been decreasing steadily since the 1950s and is presently less than half the number in 1960 (Järvinen et al. 2009; Ojala et al. 2006). There is no particular reason to expect any change in this trend, especially

since the structure of the industry is still fragmented compared to almost any global manufacturing industry. In terms of technological development, the emphasis has been on improving the papermaking process instead of developing product innovations. Ghosal and Nair-Reichert (2009) demonstrate this in their empirical research on innovativeness and technological change in the pulp and paper industry. They conclude that technological development in the industry is different from that in many other industries but not less. More specifically, the papermaking process has achieved significantly higher efficiency in recent decades. Despite such improvements, the financial performance of firms in Europe deteriorated in the late 1990s and in the North American market already in the 1960s (Ahola 2006; Lamberg 2005). The economic logic of this downward trend is the combined effect of increasing process efficiency, decreasing prices, and relative stability in paper consumption. Finally, the environment in which the firms are embedded has changed dramatically. Companies in particular have come a long way from the self-regulated system of cartels and investment quotas (Dick 1982; Guthrie 1946; Kuisma 1993) to the global value architecture in which the characteristics of specific national contexts seem to have a marginalizing effect on their strategies (Järvinen et al. 2012). Taking into consideration the special circumstances of the global paper industry in the early 2010s relative to the fragmentation of the existing research, it is appropriate to pose the research questions summarized in Table 1.2 that serve as guidelines for our a comparative analysis.

1.4 Structure of This Book

This book is divided into 11 case study chapters and a conclusion, addressing respectively the history of the paper industry in 3 Nordic countries (Finland, Sweden, and Norway), the USA, Germany, Canada, Japan, the UK, the Netherlands, Southern Europe (Spain, Portugal, and Italy), Southern America (Chile, Brazil, and Uruguay), and Russia. In Chap. 2, “The Evolution of Pulp and Paper Industries in Finland, Sweden, and Norway, 1800–2005,” Joonas Järvinen, Jari Ojala, Anders Melander, and Juha-Antti Lamberg analyze the development of the pulp and paper industry in three Nordic countries (Finland, Sweden, and Norway). The case study reported in this chapter examines the similarities and differences in the evolutionary paths of the Nordic pulp and paper industries. The Nordic countries are very similar in their pulp and paper industries, which is due to cultural similarities and also to factors related to geographical location (proximity to the continental and UK markets), natural resources (abundance of forests and water-power, navigable lakes and rivers), and human resources (abundance of cheap labor in the labor-intensive stage of the industry development). The industry evolution of the Nordic countries can be summarized as follows: late mechanization due to poor standards of living and limited domestic markets in the first part of the nineteenth century, rapid development of the pulp industry based on wood (spruce) in the latter part of the nineteenth century, building up of a heavily export-oriented industry in the interwar period, and vertical

Table 1.2 Research questions

Theme	Country-level research questions	International comparison	Theoretical interests
Industry structure and dominance	How have firm numbers and firm size distribution evolved? How has production volume fluctuated in relation to socioeconomic and institutional change?	What are the relationships of the timing of industry emergence, growth, and shakeout in different countries? What are the drivers of the temporal distribution of production volume globally?	International interdependencies in changes in industry structure The rise and fall of national industries
Technology, raw materials, products	What are the roles of the availability of technology and raw materials, on the one hand, and demand characteristics, on the other hand, in national technological advances?	What are the relationships between technology transfer, technology leadership, raw material dependence, and product variety globally?	International fluctuations in technological leadership The tension between raw material availability and distance to market in determining the competitive advantage of nations
Regulation and government policy	What have been the targets and results of national policy agendas?	What are the effects of policy interventions on industry vitality?	The extent to which industry evolution is deterministic

integration of pulp and paper production and concentration on the production of the more value-added paper grades in the post-Second World War period. In Finland especially, the pulp, paper, and allied trades dominated the whole export-oriented economy until the late twentieth century, which gave to the papermakers' association considerable weight over often highly favorable trade and fiscal political decisions (e.g., devaluation of the national currency and entry into EFTA).

In Chap. 3, "Waves of Technological Innovation: The Evolution of the US Pulp and Paper Industry, 1860–2000," Hannes Toivanen explores how technological innovation applies as an explanatory holistic framework for the United States pulp and paper industry. The chosen case method analyzes the role of technological transformation in shaping the organizational evolution of the United States pulp and paper industry from the late nineteenth century until the late twentieth century. The early waves of innovation included the introduction of the sulfite pulp process that very rapidly transformed the industry in the direction of vertical integration at the close of the nineteenth century. This technological transformation created a vibrant and very rapidly expanding newsprint industry, which was followed by a transition to tariff-protected paper grades after the abolition of tariffs on newsprint in 1913. The emerging mass consumer market and the packaging revolution created

a basis for the corporate strategies of vertical integration, economies of scale, and internalization of research and development in the interwar period. Many large-scale pulp and paper companies diversified their production into specialty products such as sanitary papers. The innovation of machine-coated paper suitable for mass printing technology offers another illustrative example of an interwar technological transformation. The diversification of the industry continued in the 1950s as offset printing, and the food and drink container industries created markets for new paper and board grades. Other significant structural and technological transformations of the North American pulp and paper industry in the twentieth century included the replacement of the sulfite process as the dominant pulping technology by the sulfate process and the improvements in the bleaching of sulfate pulp, which by 1960 triggered fundamental organizational and geographical changes in the industry. The importance of technological innovation peaked by the 1950s, after which the industry growth was triggered by corporate strategies of expansion and diversification.

In Chap. 4, “The Paper Industry in Germany, 1800–2000,” Olli Turunen analyzes the evolution of the German pulp and paper industry from the early nineteenth century to 2000. The chapter outlines the highly complex evolution of the German paper industry in its institutional and economic framework. The chosen business history case method illustrates how a country with a large domestic market and high domestic production capacity failed to create a strong domestic pulp and paper industry with prestigious companies and brands as well. Compared to the other traditional pulp- and paper-producing countries, like the Nordic countries, Canada, the United States, or Japan, “the German pulp and paper industry” with a distinctive character did not seem to exist. Rather, Germany is known for its large markets for paper and paper products. At the same time, Germany is a major paper producer in the world. The reason for this paradoxical situation can be found in the turbulent history of Germany. The country evolved from countless states into the German *Reich* in 1871, fought the two World Wars with devastating effects on the country’s economy, and was divided for decades into two ideologically disparate states, the Federal Republic of Germany and the German Democratic Republic until the overnight unification in 1990. Due to a turbulent history and the limited relative importance of the paper industry among the larger industries in Germany, the major international paper producers were able to gain a foothold in German markets relatively easily in the 1990s. Today, the German paper industry consists of large multinational companies as well as small niche domestic producers.

In Chap. 5, “An Accomplished History, An Uncertain Future: Canada’s Pulp and Paper Industry Since the Early 1800s,” Mark Kuhlberg traces the industry’s development from the early 1800s until today, focusing in particular on Canada’s corporate strategy, industry structure, and the role of the government. In terms of corporate strategy, Canadian producers have relied heavily on the strengths of acquiring the country’s natural resource bounty. There were many factors that contributed to this strategy. Importantly, Canada’s colonial past left all the country’s timber tracts and water powers in the hands of the provincial governments, instead of private control. The industry structure dispersed into two sectors, the preponderant one was shaped by big, initially predominantly American-owned corporations in the newsprint sector,

which sold largely to the US market. The other was driven by relatively small, largely Canadian-owned firms that manufactured other than newsprint grades for the domestic markets. By the end of the Second World War, the Canadian pulp and paper industry had established itself as a dominant player on the world's stage. The growth of the industry was due to Canada's abundant natural resources but also generally favorable tariffs for newsprint in the American market and within the British Empire. The growth of the newsprint sector continued after the Second World War, but Canada's share of the world's total production declined from 60% to roughly 20%. Intensified international competition, the disappearance of favorable tariffs, and the advantages afforded by natural resources as well as decreasing demand for newsprint in the American market are among the most important reasons for the decline of the industry.

In Chap. 6, "From the Non-European Tradition to a Variation on the Japanese Competitiveness Model: The Modern Japanese Paper Industry Since the 1870s," Takafumi Kurosawa and Tomoko Hashino describe the development of the modern Japanese paper industry and the production of Western machine-made paper (*yoshi*) since the 1870s. The modern Japanese paper industry evolution differs markedly from the development of the European paper industry. It has been characterized by rapid growth, low import dependency, and cartelization. The rapid industry growth was caused by a major domestic demand for paper, fueled first by modernization in the late nineteenth century, then the emergence of journalism and publishing in the interwar period, and finally the postwar economic boom. Interestingly, the traditional Japanese paper (*washi*) held onto its market even after the establishment of the *yoshi* paper industry. The distinctive nature of the modern Japanese paper industry is due to the country's isolated geographical location, abundant raw material resources, and large domestic market. These factors have contributed to Japan's high self-sufficiency and low direct foreign investment ratio.

In Chap. 7, "The British Paper Industry, 1800–2000," Timo Särkkä investigates the birth of British mechanical papermaking, its growth to maturity, and decline in importance. The case method illustrates how the nature, the scale, and the distribution of papermaking changed in Britain from 1800 to 2000. The analysis focuses on historical particulars such as technological transformation, raw materials, trade policies, production capacity, and employment. Britain was the first country in the world to pioneer paper manufacturing. In retrospect, it is matter of particular significance to analyze both the reasons for this early impetus but also the consequences of being first in a line of papermaking businesses. In the first part of the nineteenth century, Britain was the world's largest and lowest-cost producer of paper. The reasons for Britain's early success include improvements in papermaking technology together with significant advantages which explain its overall industrial success, such as a supply of cheap and accessible coal, craftsmanship, a stable society, and an efficient transport system. Regarding the British paper industry, the domestic demand is the key to understanding the early British paper industry. Growing population, new patterns of social consciousness, increased literacy, and heightened social awareness are all included in the important reasons underlying the domestic demand for paper. The First World War revealed Britain's vulnerability in terms of

raw materials supply. Due to changes in raw materials and papermaking technologies, British papermakers lost their technological edge over the major overseas competitors. The removal of the tariff barriers after the Second World War subjected British markets to competition, which explains the British paper industry's rapid decline in global importance.

In Chap. 8, "The Paper and Board Industry in the Netherlands, 1800–2000," Bram Bouwens focuses on the development of the paper and board industry and the corporate strategies in the Netherlands, which was one of the most important centers of hand-made paper manufacture in early modern Europe. The Dutch paper producers retained traditional production methods until the late nineteenth century, after which the industry was quickly industrialized as the utilization of wood as a raw material revolutionized the whole industry. The Dutch business system was highly coordinated during most of the twentieth century. Price fixing, cartel agreements, and the process of concentration through mergers and acquisitions characterized the industry. The post-Second World War years especially were prosperous for the Dutch paper and board producers, but in the mid-1960s, the industry was faced with saturated markets and increased competition from the Nordic producers. The example of the Dutch paper and board industry illustrates vividly how national boundaries quickly lost their significance at the turn of the new millennium. The Dutch paper and board industry became part of international decision-making within a local context. It also reveals the vulnerability of a national paper industry as multinational corporations closed down their production facilities in the Netherlands.

In Chap. 9, "Is there a Southern European Model? Development of the Pulp and Paper Industry in Italy, Spain and Portugal (1800–2010)," Miquel Gutiérrez-Poch analyzes the particulars of the development of the papermaking industry in Spain, Portugal, and Italy. These three Southern European countries have a considerable number of characteristics in common as regards the historical development of their pulp and paper industries. A strong hand-made paper manufacture tradition, late and slow mechanization of the industry, modest domestic supply of fibrous raw materials in the first half of the twentieth century, as well as strong and export-oriented sulfate pulp industry based on eucalyptus fiber in the latter part of the twentieth century (in Spain and Portugal) are among the most important common characteristics of the industry development in the Southern European cases analyzed. The chapter poses an important question as to whether there is indeed a specially defined Southern European evolutionary path with which to analyze, define, and respond to the problems the papermaking industry is facing in the region.

In Chap. 10, "The South American Pulp and Paper Industry: The Cases Brazil, Chile and Uruguay," Maria Barbosa Lima-Toivanen illustrates how the pulp and paper industry in South America, particularly in Brazil, Chile, and Uruguay has evolved from its birth to its present organization. Compared to the mature western paper markets, South America is an emerging economic region, especially in terms of pulp production. In recent years, Brazilian and Chilean pulp and paper producers have invested heavily in technology in order to benefit from natural resource advantages and fast-growing eucalyptus plantations. Today, South American companies

have become global cost leaders in pulp production. The industry in the country cases analyzed is heavily export-oriented and highly concentrated. Operations are facilitated by similarities of culture and language and geographical proximity, but there are also notable differences in industry structure. In Chile, the industry is controlled by large domestic companies, whereas in Brazil and Uruguay, the capital-intensive profile of the industry is attributable to the presence of multinational companies. Increasing pressure on the environment and the impact of investments on local communities have brought the question of corporate social responsibility onto the agenda.

In Chap. 11, “The Pulp and Paper Industry Evolution in Russia: A Road of Many Transitions” Olga Mashkina analyzes the evolution of the development of the pulp and paper industry in Russia. The chapter focuses on changes in firms, industry structure, and changes in regulation and government policies during the era of the Russian Empire, the Soviet era, and the era of transition to a market economy. The Soviet regime inherited from the Czarist era a paper industry consisting of a large number of small, nonintegrated mills. The Soviet economy brought the pulp and paper industry to a new level by building more mills, improving efficiency and technology of the mills, and consequently increasing productivity as well. Despite the huge potential afforded by the abundant supply of domestic raw materials, the pulp and paper industry of the Soviet era was, however, frustrated by low domestic demand, high transportation and energy costs, unclear legislation, structural inefficiency, as well as lack of investments in up-to-date technology. These factors delayed the modernization of the industry, which until recently has been characterized as labor-intensive, an export-oriented strategy and a highly concentrated corporate structure. The era of the market economy has also been characterized by a resumption of the old patterns inherited from the Soviet period despite the rapid change of formal institutions.

In Chap. 12, “Global Demand for Paper Products: 2006–2050,” Joonas Järvinen, Juha-Antti Lamberg, Tomi Nokelainen, and Henriikki Tikkanen focus on analyzing the global demand for paper and paper products up to the year 2050. The analysis evolves from a realization that there exists a saturation point after which the increasing wealth of nations and individuals does not increase the consumption of paper. In other words, it is argued that there is a natural limit to how much paper an individual may consume. This simple but important realization leads to a thought-provoking market forecast for paper consumption in ten economic regions (Western and Northern Europe, Southern Europe, Eastern Europe, Northern America, South America, Africa, Eastern Asia, Southeast Asia, Southern Asia, and Western Asia). The analysis is based on the two most reliable variables regarding future developments, namely demographic changes and historical consumption patterns. The analysis concludes that continuing population growth, urbanization, and increase in the wealth of nations are likely to increase the demand for paper and paper products globally. However, the growth is forecast to spread rather unevenly over different economic regions. In the already very mature markets (e.g., Western and Northern Europe and Northern America), paper consumption is expected to grow modestly; in the currently quickly growing markets (e.g., Eastern

Asia, especially China), the growth is likely to slow down, and in the emerging markets (e.g., Southeast Asia and Southern Asia), there is still ample room for growth. These developments may have considerable effects on the global paper industry structure in the near future.

Finally, the concluding chapter by Jari Ojala, Miikka Voutilainen, and Juha-Antti Lamberg combines the theoretical framework presented in the introduction with the empirical findings of the country-specific chapters. Moreover, the concluding chapter includes an analysis of industry life cycles in pulp and paper industries, showing periods of emergence, maturity, and shakeout.

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Chapter 2

The Evolution of Pulp and Paper Industries in Finland, Sweden, and Norway, 1800–2005

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2.1 Introduction

In this chapter, we study Finland, Sweden, and Norway as examples of countries with small firm populations without intense domestic competition. This has enabled firms to build certain organizational capabilities while neglecting others. The basic story line in the Nordic paper industry evolution is that a few firms that emerged as industrial populations were (a) built on to exploit abundant resources (timber, water, labor), (b) focused to a large extent on exporting their products, and (c) relied on cooperation between competitors to succeed in competition with the large firms populations of Britain and Germany – the two main markets for Nordic paper industry products.

As we lack a comprehensive comparative account on the evolution of the Nordic paper industries, we start our inquiry by analyzing the historical development of the paper industry in Finland, Sweden, and Norway, thereby excluding Denmark and Iceland (Jorgensen 1964). What follows is a comparative analysis of the antecedents and consequences of the evolution of firms in the context of peripheral competitive dynamics. We focus especially on the reasons why the evolution in the countries

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