Abstract

This paper aims to investigate the relationship between business and innovation strategies in a time of industry transformation. The paper conceptualizes business and innovation strategies based on two main dimensions, the competitive position and the resource position. For the business strategy, the paper addresses Porter’s (1980, 1985) generic competitive strategies and the resource-based view (Barney, 2001b). For the innovation strategy, the paper addresses the dimensions of technology strategy (Zahra and Covin, 1993) and the degree and the type of ambidexterity. The empirical case study builds on 15 interviews with 8 producers in the Swedish pulp and paper industry, which currently faces transformation pressures.

Regarding business strategies, the results reveal three strategic groups, with different characteristics in terms of both competitive position and resource position. For innovation strategies, the results show that the companies mainly differed with regard to competitive positioning, while with regard to resource position, they were more similar. In particular, a common for most companies type of ambidexterity strategy, market-driven exploitation, is revealed and explained. In terms of interrelation between the business and innovation strategies, the results complement previous research by showing a clear relationship between the two strategy types for competitive position dimension, and by providing a more detailed understanding of this relation within the resource dimension.

The paper provides a complementary explanation of the observed slow transformation of the industry, highlighting the strains such a transformation puts on the involved companies in terms of the trade-offs involved in changing strategic direction while retaining core capabilities.
Transformation in a mature industry: the role of business and innovation strategies

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1. Introduction

Technological change is an ongoing process in technology-based industries irrespectively whether they are emerging or established. Sometimes both internal factors and changes in external environment may cause rather significant industrial transformations pressuring companies to change their technology base (Taylor and Helfat, 2009), or to enter new product markets. Such transformational tensions come with both challenges and opportunities for the affected companies (Novotny and Laestadius, 2014). One example of an industry in transformation is the Swedish pulp and paper industry, which after decades of stable business within established markets, has faced a number of challenges and opportunities. On the one hand, several of the established business segments are declining (e.g. newspaper, printing paper). On the other hand, increasing sustainability pressures have encouraged the use of forest raw materials in the development of sustainable substitutions for a number of fossil-based products, e.g. plastic packaging, textiles, fuels, chemicals etc. (Onufrey and Bergek, 2018, Novotny and Nuur, 2013, Karltorp and Sandén, 2012). Furthermore, as many established sectors, pulp and paper industry is resource-intensive and existing investments and other resources keep playing and important role also in developing of new products for new markets (Onufrey and Bergek, 2018).

The success of this transformation is dependent on the business and innovation strategies of the pulp and paper companies. To accelerate the transformation of this industry, the companies’ strategies and the interconnections between business and innovation strategies need to be understood. Therefore, the purpose of this paper is to investigate the relationship between business and innovation strategies in a time of industry transformation.

By presenting a detailed view of the companies’ strategies, this study provides a complementary explanation of the observed slow transformation pace of pulp and paper companies into bio-refineries (cf. Hellsmark and Söderholm, 2017, Hansen and Coenen, 2017, Novotny and Nuur, 2013), highlighting the strains such a transformation puts on the involved companies in terms of the trade-offs involved in changing strategic direction while retaining core capabilities associated with the exploitation of existing assets.

2. Theoretical framework

The theoretical background of this paper addresses three key aspects. First, a framework to analyse business strategies in a time of industry transformation is provided, centred around
Porter’s (1980, 1985) generic competitive strategies as well as the resource-based view (Barney, 2001b, Grant, 1991). Second, the previous research on the relationship between business and innovation strategies is summarized. Finally, innovation strategies are considered, on the one hand from the perspective of strategic position and, on the other hand, from the perspective of resource position.

2.1 Business strategy: competitive positioning and the resource-based view

In general terms, strategy involves “the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals” (Chandler, 1962/1990, p. 13). A realized strategy can be deliberate (intended), emergent (a consistent pattern of behaviour) or a combination of these (Mintzberg, 1987). Business strategy more specifically refers to strategies to gain and sustain competitive advantage and tends to be related to a firm’s provision of goods and services (Campbell et al., 2011).

According to Grant (1991, p. 114), strategy has been defined as “the match an organization makes between its internal resources and skills … and the opportunities and risks created by its external environment.” This suggests that business strategy has two facets. On the one hand, companies need to find an attractive industry and position themselves well in relation to various competitive pressures in that industry. This is at the heart of Porter’s (1980) “five forces framework”. On the other hand, they need to build on the resources they have and exploit their unique competences and capabilities. This is developed further in the resource-based view (RBV) (Barney, 2001b) and the related literatures on core capabilities (Leonard-Barton, 1992, Prahalad and Hamel, 1990) and complementary assets (Teece, 1986, Helfat, 1997). These two perspectives have sometimes been described as competing or even incompatible. We would, however, argue that they both provide important insights into firms’ business strategies and should be seen as complementary, as the value of a firm’s resources can only be determined in relation to opportunities and threats in the firm’s environment (Barney, 1991, Porter, 1991) and a firm’s resource position influences its ability to realize a generic competitive strategy (Grant, 1991, Porter, 1991). Moreover, both perspectives are needed to understand the dynamic relationship between competitive strategy and innovation.
(as discussed in coming sections) (Zahra et al., 1999). In the following, these two facets will be described more in detail, as a basis for our theoretical framework.\(^1\)

The competitive positioning perspective implies that a firm’s success depends partly on the attractiveness of the industry in which it competes and partly on the firm’s position in that industry (Porter, 1991). Firms can influence both of these with their strategies, but we will here focus on the three generic strategies a firm can use to influence its relative position in a particular industry (Porter, 1985).\(^2\)

To achieve an attractive position, a firm must have a competitive advantage in relation to its main rivals, either in terms of lower costs or in terms of product differentiation.\(^3\) A company that chooses a *cost leadership strategy* aims at becoming the low-cost producer in its industry.\(^4\) This can be achieved through exploiting, for example, economies of scale and scope, favourable access to raw materials, or proprietary technologies. Normally, a large market share and a wide scope is required. The firm’s products tend to be standardized, but they have to be perceived as comparable or acceptable in comparison with rival products in order for the firm to be able to charge a close to average price and get a competitive margin.

A *differentiation strategy* involves trying to be unique – or at least substantially better than the competitors – in some dimension that is valued by a large share of buyers. In return, the firm can charge a higher price, sell more at a given price or gain buyer loyalty. Uniqueness is not only related to products, but can be based on different steps in the value chain, from raw material to distribution and service. However, the cost of achieving uniqueness cannot be higher than the price premium the firm can charge from the buyers and it therefore has to strive to reduce all costs that do not affect its differentiation advantage in order to achieve cost parity or proximity in comparison with its rivals.

\(^1\) Another common approach to competitive strategy is the Miles and Snow (1978) framework. There are several indications that the two frameworks are substitutable. First, researchers seem to alternate between them or even combine them (Vázquez et al, 2001; Olson et al 2005). Second, operationalisations of the Miles and Snow framework tend to include much the same dimensions as described in Porter’s generic strategies (Zahra and Covin, 1994). However, in contrast to Porter, Miles and Snow include innovation-related aspects in their definition of the different strategies, which creates a conceptual overlap between business strategy and innovation strategy (Zahra and Covin, 1994). For the purpose of this study, we therefore consider it less useful than Porter’s framework.

\(^2\) This section is based on Porter (1985) unless other references are provided.

\(^3\) For the purpose of this discussion and our analysis, we treat these two options as distinct.

\(^4\) In most industries, there can only be one cost leader, but for firms in commodity industries it can be enough to be in the lowest quartile to sustain a low cost strategy (Porter, 1985).
In addition to deciding on a basis for its competitive advantage, the firm has to decide on the scope of its business, i.e. how many market segments it should serve, which geographical locations it should be present in, how vertically integrated it should be and in how many different businesses it should be involved (Porter, 1991). A focus strategy implies that the firm makes a narrow selection of segments etc. and dedicates itself to that particular segment, location, step in the value chain etc. By doing so, the firm takes advantage of its broader-scope rivals’ suboptimal performance. A focus strategy can be based on differentiation (if rivals underperform) or cost leadership (if rivals over-perform with unnecessarily high costs as a result).

As mentioned above, the ability of a firm to achieve its chosen competitive position is dependent on its resource position (Grant, 1991). Resources are tangible and intangible assets which are tied to or controlled by a firm and which are used in the firm’s production process and enables it to improve its efficiency and effectiveness (cf. Wernerfelt, 1984, Barney, 1991, Grant, 1991). They can be categorized in different ways, but six main types are often mentioned in the literature: financial resources, physical resources, human resources, technological resources reputation and organizational resources (e.g. Grant, 1991).

A basic assumption of the RBV is that resources are not distributed evenly between firms and that only resources that are valuable, rare, imperfectly imitable and non-substitutable can allow the firm to create new economic value and capture it, i.e. be competitive (Barney, 1991, Peteraf, 1993, Nason and Wiklund, 2018). However, in order for resources to create competitive advantage, they have to be used to perform a task or an activity (Mahoney and Pandian, 1992, Grant, 1991). The firm’s ability to use bundles of resources to create competitive advantage constitutes its capabilities (Grant, 1991, Barney, 2001b). Some of these are more important than others to the firm’s competitive advantage. In the literature, these are called “core competencies” (Prahalad and Hamel, 1990), “central capabilities” (Grant, 1991) and “core capabilities” (Leonard-Barton, 1992). In order to successfully exploit them, the firm also needs access to “complementary assets”, located upstream (e.g. raw materials and related knowledge) or downstream (e.g. manufacturing, marketing and service assets) (Teece, 1986, Helfat, 1997).

With regard to strategy, a resource-based perspective implies that the main strategic task for the firm is to decide which resources to exploit in which way, to create a certain level of competitive advantage (Barney, 2001a). From a more dynamic perspective, it also concerns
how to put underutilized or excess resources to use, make more efficient use of existing resources in current applications and how to transfer resources from one use to another, more profitable application (Grant, 1991, Nason and Wiklund, 2018).

In a context of industry transformation, the relative importance of a firm’s strategic position and resource position is uncertain. On the one hand, changes in the environment can change the value and importance of firm resources (Mahoney and Pandian, 1992, Porter, 1991) and the firm might have to shift strategic focus and loosen the constraints of its current resource base (Porter, 1991) in order to escape path dependency and lock-in (Leonard-Barton, 1992). On the other hand, in turbulent times the firm’s existing resources might be a more stable basis for formulating a strategy than its competitive position (Grant, 1991). This implies that the direction of growth and diversification will be influenced by the firm’s current resource profile (Mahoney and Pandian, 1992, Helfat, 1997).

Summing up, in a transformation context firms have to reunite existing resources and capabilities that reflect prior decisions and commitments with innovative (and potentially disruptive) forces of change (Blumentritt and Danis, 2006), external as well as internal (Zahra et al., 1999), where the latter involves balancing the exploitation of existing resources and the development of new ones (Wernerfelt, 1984, Grant, 1991). This challenge is at the heart of the literature on innovation strategy, which seems to imply that there should be a close connection between business strategies and innovation strategies.

2.2 The relationship between business and innovation strategies

In the strategy literature, several authors have highlighted the importance of achieving a strategic “fit”, between business strategy and innovation strategy, suggesting that firms that make coherent choices with regard to various technology strategy dimensions perform better provided that these are aligned with the firm’s overall competitive strategies (Zahra and Covin, 1993). In other words, innovation will only be associated with firm performance to the extent that the firm pursues a consistent mix of the right types and sources of innovation etc. in relation to its chosen business strategy (Zahra and Covin, 1994). More recently, it has been argued that alignment between innovation and business strategies creates synergies between business units, improves firm performance, influences opportunities for vertical integration and has an impact on the firm’s ability to benefit from technological changes (Arasti et al., 2017).
Some of these interconnections between companies’ business strategies and their innovative activities and strategies have also been established empirically. Most studies focus on the relationship between business strategy and innovation activity. It has for example been shown that firms with different business strategies differ in their propensity to innovate (Dobni, 2010, Olson et al., 2005) and their level of new product activity (Frambach et al., 2003), and that firms need to translate their business strategies into more specific guidelines for choices related to technology and markets to be able to handle the “front-end” of the innovation process (Khurana and Rosenthal, 1998).

In contrast, only a few studies focus on the relationship between business strategy and innovation strategy:

- Zahra and Covin (1993) studied the relationship between technology strategy, business strategy and firm performance through a questionnaire to 368 U.S. firms. They found that a selection of four business strategy dimensions (commodity-to-specialty products, marketing intensity, cost leadership, and product line breadth) were correlated in different ways with three technology strategy dimensions (aggressive technology posture, automation and process innovation, and new product development) and that firms with similar business strategies (strategic “clusters”) pursued similar combinations of the technology strategy dimensions. They also found that the influence of specific technology policy dimensions on firm performance varied between the clusters, which they concluded implies that each technology policy dimension “fits” better with some business strategies than with others.

- Zahra and Covin (1994) studied the relationship between technology strategy, technology strategy and firm performance based on a questionnaire to about 100 undiversified manufacturing firms in fragmented industries in the U.S. They found that firms following different business strategies (defined in terms of the Miles and Snow (1978) framework) differed substantially in terms of innovation types and sources. They also found that each strategic type was associated with a specific relationship between innovation types/sources and performance and that both the internal consistency of the innovation strategy and the alignment between business and innovation strategies matter for firm performance.

- Blumentritt and Danis (2006) studied the relationship between business strategy and innovation strategy (“approach to innovation”), based on a questionnaire to 244 firms
across different industries. They found that firms pursuing different business strategies (defined in terms of the Miles and Snow framework) used different sources of innovation and targeted different types of innovation (product, process and administrative innovation) and also differed in terms of how important they found different barriers to innovation.

Together with the other studies mentioned above, as well as other similar research, these studies have provided important insights into the relationship between business strategy and innovation strategy. They have established that there is a relationship between business strategies and innovation-related activities and strategies and that this relationship matters for firm performance. However, these finding base on cross-sectional data and therefore do not provide a detailed view of how the interrelation between business and innovation strategies can look like for particular companies or in a specific context of industrial transformation. Further, they also have some conceptual shortcomings. First, the lack of conceptual consistency across the studies is striking. Whereas the business strategy dimension is for the most part conceptualized using either Porter’s (1985, 1980) generic strategies, Miles and Snow’s (1978) typology or a mix of the two (e.g., Olson et al., 2005, Vázquez et al., 2001), innovation activity/strategy is conceptualized in different ways in different studies. As indicated above, dimensions include innovation orientation, new product activity, innovation sources, types of innovation, and barriers to innovation – just to name a few. This conceptual variety serves as an additional complication when trying to create an overall understanding of the interrelation between business strategy and innovation strategy. Second, most studies take their explicit or implicit departure in the strategic positioning view on strategy, as evidenced by the use of the Porter and Miles and Snow frameworks. As a consequence, their understanding of innovation strategy is largely limited to technology strategy dimensions (as shown above), which means that knowledge about resource-based business and innovation strategies and their relationship is highly limited.

In the next section, this paper addresses these shortcomings by combining a number of commonly agreed-on technology strategy dimensions with dimensions related to the resource-based view (using recent writings on exploration/exploitation and ambidexterity) into an expanded innovation strategy framework.
2.3 Conceptualizing innovation strategy

Research on innovation strategies evolves around three main questions: first, what kind of innovations can be pursued, second, why do companies innovate, i.e. what are the innovation precursors or driving forces, and third, how the aspired innovations can be achieved, i.e. based on what (existing or new) resource bases (Rothaermel and Deeds, 2004, Onufrey and Bergek, 2018). This section will summarize the answers to these questions provided in the current research.

With regard to the first question, previous research has established that innovation is a multifaceted phenomenon and therefore discussion of different kinds of innovations needs to account for a number of aspects. One relevant aspect is the degree of technological novelty, where introduction of innovations at the edge of technological development reflects the aspiration of a company to be a technology leader (Zahra and Covin, 1993). Another aspect is product innovation which refers to the rate and magnitude of new product introductions. Finally, the aspect of process innovation is important as it reflects the use of state-of-the-art production technology (Zahra and Covin, 1993). The strategic choices within each of the aspects have been studied before as well as combinations between them, but it still needs to be studied how the process of industrial transformation affects them. Similar to Porter’s (1985) framework, the choices made within each of the three dimensions shape the strategic positioning of a company in terms of innovation.

On the contrary, the remaining two questions central for innovation strategy (innovation precursors and existing vs new resource base) are closely connected to the RBV and put the notion of resources in the centre. With respect to the use of resources for the purposes of innovation, two opposite innovation strategies are distinguished, exploitation and exploration. Exploitation is concerned with refinement and reusing of existing resources and competences (Baum et al., 2000) and is often associated with innovation activities within existing product-market domains (He and Wong, 2004). The resulting innovations build further on existing knowledge (Morgan and Berthon, 2008) On the contrary, exploration is described in terms of larger variation and experimentation aimed at new discoveries (Baum et al., 2000, Rothaermel and Deeds, 2004), largely in new product-market domains (He and Wong, 2004). The results of this strategy are often described in terms of considerable technological advantages compared to previous products (Morgan and Berthon, 2008)
The differences between exploitation and exploration strategies are significant: they are rooted in different learning capabilities (Baum et al., 2000) and assume different configurations with regard to competencies, structure and culture (O’Reilly III and Tushman, 2008, Koryak et al., 2018). Therefore, previous studies have highlighted tensions between the two strategies and underlined inevitable challenges if trying to combine them (Koryak et al., 2018, Andriopoulos and Lewis, 2010, Raisch and Birkinshaw, 2008), and some of the early studies even considered successful combination of exploitation and exploration either impossible or very rare (March, 1991, Tushman, 1996).

However, more recent studies have become more open towards the possibility to combine exploitation and exploration (cf. Andriopoulos and Lewis, 2010, Raisch and Birkinshaw, 2008), which is visible in theoretical discussions that are focussing not only on tensions, but also potential synergies between the two strategies. Over the past decade research has not only started viewing exploitation and exploration as complementary and achievable simultaneously (Morgan and Berthon, 2008), but also highlighted the necessity to combine the two strategies in order to survive and succeed both in short-term and in long-term (O’Reilly III and Tushman, 2008). Combining exploitation and exploration can help avoiding negative consequences of each of the strategies pursued alone. Pure exploration implies a risk to introduce too many changes which, without clear continuity, may lead to chaos. There, elements of exploitation can help establishing continuity and avoiding chaos. On the contrary, excessive exploitation may result in inertia and competency traps which can be prevented with the help of exploration (Raisch and Birkinshaw, 2008, He and Wong, 2004).

The innovation strategies that combine exploitation and exploration are discussed in research within the concept of ambidexterity (Tushman, 1996). Ambidexterity refers to an “ability to exploit existing assets and positions in a profit producing way and simultaneously to explore new technologies and markets; to configure and reconfigure organizational resources to capture existing as well as new opportunities” (O’Reilly III and Tushman, 2008, p. 189). By definition, ambidexterity has a dual focus on, on the one hand, current demands and short-term viability, and on the other hand, changes in the environment and future viability (Koryak et al., 2018, Levinthal and March, 1993).

Ambidexterity is associated with improved business performance (Morgan and Berthon, 2008). Importantly, to achieve that, it is not enough to just have both exploration and exploitation, but both elements need to receive high and relatively equal emphasis, and they
need to be strategically integrated (Raisch and Birkinshaw, 2008, He and Wong, 2004). There are some limitations though. Very high levels of exploitation and exploration can hardly be achieved simultaneously as that would also boost organizational tensions between them (He and Wong, 2004).

It is clear that the time of industrial transformation requires companies to develop abilities to effectively adapt to current situations while at the same time trying to foresee and prepare for further changes, or in other words, become ambidextrous. However, a question of what innovation strategy to adopt at a time of industrial transformation still requires further investigation as ambidexterity can take a multitude of different forms.

First, exploitation and exploration can be differentiated and integrated to different extents and by use of a number of organizational mechanisms. One such mechanism is integration or separation in organizational structure. Activities associated with exploitation and exploration can be driven in separate organizational units, in the same one, or via parallel structures (e.g. matrix organization) (Raisch and Birkinshaw, 2008, Raisch et al., 2009). Other mechanisms include the composition of top management team, written vision, focus on R&D investments, and continuous improvement (Koryak et al., 2018). The importance of integration between exploitation and exploration is not questioned, but some researchers argue that both differentiating and integrative mechanisms are needed (Koryak et al., 2018, Andriopoulos and Lewis, 2010), while others especially stress the importance of the integrative ones, such as organizational linkages (in terms of communication and coordination) between new and existing assets (Taylor and Helfat, 2009).

Second, ambidexterity can to different degrees build on internal vs external resources. As an overview by Raisch et al (2009) showed, research mainly focused on how ambidexterity can be addressed internally, whereas inter-organizational activities are essential for both exploitation and exploration and contribute to organizational renewal. Importantly, innovation sourcing has been considered as one of central aspects of innovation strategy not only in the context of ambidexterity, but also in more general innovation and technology strategy studies (e.g., Zahra and Covin, 1994).

To sum up the innovation strategy framework, it can be concluded that the elements of both strategic positioning and the RBV need to be considered. In terms of strategic positioning, the choices with regard to technology leadership, the rate of product innovation and the focus on
process innovation need to be investigated, although previous research does not give much indication regarding how those choices can look like at the time of industry transformation. From the resources perspective, ambidexterity strategy is likely to be relevant at the time of industry transformation with a dual pressure of ensuring short-term survival and long-term viability. However, ambidextrous strategies can vary with respect to a number of dimensions and it is not clear what particular configuration can be used and why. The choice of a particular innovation strategy is influenced by and integrated with the business strategy though further research is needed to understand this influence (see Figure 1). This leads us to formulate our research questions:

**RQ1:** What characterizes the (new) business strategies of the pulp and paper industry and what is the relative importance of competitive position and resource position?

**RQ2:** What characterizes the innovation strategies of the pulp and paper industry in terms of competitive position (i.e. technology leadership, product and process innovations), and resource position (i.e. the choice of one of forms of ambidexterity)?

**RQ3:** How do the innovation strategies of the pulp and paper industry reflect its (new) business strategies?

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**Figure 1.** Analytical framework: competitive position and resource position as two business and innovation strategy dimensions
3. Methodology

3.1 Case selection

The case of the Swedish pulp and paper industry was chosen as an example of an industry undergoing a transformation process which implies that both business and innovation strategies have recently changed (Olander Roese, 2014).

We have contacted all the companies in the Swedish pulp and paper industry, out of which eight companies agreed to take part in the study.

3.2 Data collection

The study builds on 15 interviews with 8 pulp and paper producers in Sweden. We conducted two interviews per company, with the exception of one company where the two interviews were combined. The first interview focused on business strategies and the second one – on innovation strategies. All interviews were recorded, fully transcribed, coded using the NVivo software, and analyzed following our theoretical framework.

For both types of interviews, theory-based interview guides were prepared to ensure that all central concepts with regard to business and innovation strategies would be covered.

In addition to that, a survey was sent to all pulp and paper plants in Sweden where questions about business and innovation strategies were included. Out of 42 plants contacted, 24 filled in the survey which gives the response rate of 57%.

3.3 Data analysis

Data analysis consisted of several steps. First, we coded all the interviews according to main dimensions considered in the theoretical framework, covering different aspects of business and innovation strategies. The list of these first-order codes that illustrate the operationalisation of key concepts is summarized in Table 1.

Second, we categorised business strategies of companies in terms of competitive positions (i.e. within dimensions differentiation vs cost leadership, market segments, product portfolio, and degree of vertical integration). We used these categorisations to define strategic groups, i.e. companies with similar strategic profiles. The three groups were identified and are further discussed in Section 4.
Third, we proceeded with categorizing all companies within all dimensions (business and innovation strategies, competitive positions and resource positions). At this stage, the unit of analysis were the three strategic groups, but differences between the companies in the same group were noted and highlighted in the analysis. During this analysis we also introduced second-order codes that reflected key patterns of activities (e.g. take advantage of existing plants, existing plants as limitations, ambition to find new markets, ambition to create customer value etc.). Those second-order codes were used to drive nuanced comparisons across strategic groups.

Finally, we used the results of the survey to prove the overall, cross-group patterns observed in the interviews. Thus, most of the analysis below is based on the interviews, but it is complemented with the survey results for some industry-wide findings.
<table>
<thead>
<tr>
<th>Type of strategy</th>
<th>Sub-category</th>
<th>Dimension</th>
<th>Indicator/Nvivo code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business strategy</td>
<td>Competitive positioning</td>
<td>Cost leadership</td>
<td>Product properties: bulk, generic products, low price, scale</td>
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<td></td>
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<td>Important cost items</td>
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<td>Focus on cost reduction</td>
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<td></td>
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<td></td>
<td>What customers demand (if low quality demanded)</td>
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<td></td>
<td>Differentiation</td>
<td>Switching cost</td>
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<td></td>
<td></td>
<td></td>
<td>Product properties: function, sustainability/environmental performance, high quality unique product, unique raw material</td>
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<td></td>
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<td></td>
<td>Service</td>
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<td></td>
<td></td>
<td></td>
<td>Other parts of offer</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>What customers demand (if differentiated offer demanded)</td>
</tr>
<tr>
<td>Scope 1: market segments</td>
<td>List of customer segments</td>
<td>assessment whether it is narrow or broad</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Focus: adjustment segment – offer, customers with specific needs, niche products, increased focus, specific segment</td>
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<td></td>
<td></td>
<td>Geographic segments</td>
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<tr>
<td>Scope 2: product portfolio</td>
<td>List of products</td>
<td>assessment whether it is narrow or broad</td>
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<td></td>
<td></td>
<td>Synergies between products</td>
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<td>Scope 3: vertical integration</td>
<td>Value chain</td>
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<td>- Current value chain</td>
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<td></td>
<td></td>
<td>- Vertical integration</td>
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<td></td>
<td></td>
<td>- Lack of vertical integration</td>
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<tr>
<td>Resource position</td>
<td>Key resources</td>
<td>Important cost items</td>
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<td></td>
<td></td>
<td>Capital</td>
<td></td>
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<tr>
<td>Innovation strategy</td>
<td>Competitive position</td>
<td>Core capabilities</td>
<td>Complementary assets</td>
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<tr>
<td>Machinery and equipment</td>
<td>Other</td>
<td>Knowledge and experience</td>
<td>Inter-dependencies in the value chain</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Innovation strategy</th>
<th>Competitive position</th>
<th>Core capabilities</th>
<th>Complementary assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product innovation</td>
<td>Innovation types: development of existing products, new product/service to a new/existing market</td>
<td></td>
<td></td>
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<tr>
<td>Innovation scope: rejected directions, discussion of diversification, discussion of development within existing product areas</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Process innovation</th>
<th>Innovation types: new process to new/existing market, development/adjustment of an existing process</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Resource position</th>
<th>Ambidexterity 1: degree of ambidexterity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploitation + Exploration (simultaneously)</td>
<td></td>
</tr>
<tr>
<td>Innovation scope: rejected directions, discussion of diversification, discussion of development within existing product areas</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambidexterity 2: separation vs. integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation division</td>
</tr>
<tr>
<td>Innovation process</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambidexterity 3: internal vs. external sourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration across value chain</td>
</tr>
<tr>
<td>Licenses</td>
</tr>
<tr>
<td>External sourcing</td>
</tr>
<tr>
<td>Internal development</td>
</tr>
</tbody>
</table>
4. Empirical findings and analysis

4.1.1 Business strategies: three strategic groups

As described in the methodology section, the eight pulp and paper companies can be grouped into three quite distinct strategic groups, based on the competitive positioning aspect of their business strategies (see Table 2).

Group A – “the segment players” – consists of three companies (A1, A2, and A3), which provide niche products, such as particular types of fine paper or packaging materials. In comparison with other companies, this makes them quite focused (or even niched). Within their main product area, Companies A1 and A2 provide a range of different product variants and all three companies serve a broad set of different customer segments, both geographically and in terms of customer types. While the type of products these companies produce to some extent are commodities, they all pursue a differentiation strategy. This is, for example, evidenced by interview statements describing how they strive to provide non-generic or even unique products, by providing features customers value (e.g. material strength, product quality and quality consistency, colour), and having the right product certifications. Service flexibility is also an important competitive advantage for all three companies. While it is clear that they cannot (and do not want to) compete on price, they still all emphasize the need to manage their cost levels in different ways to maintain their profitability. The main difference between the companies in this group is that Companies A1 and A3 are active in only one step of the value chain, whereas Company A2 is integrated forward, from pulp to packaging materials.

Group B – “the commodity suppliers” – consists of two companies (B1 and B2). They provide one main type of rather undifferentiated product, in combination with a number of by-products (e.g. energy, bio-based fuels and chemicals). They both describe their main products as a bulk product or raw material, which does not have many special characteristics and cannot be differentiated to any larger extent. They are therefore forced to compete mainly on cost and achieve this position through, for example, process improvements (B1, B2), improvements in chemical recipes (B1), and vertical integration (B2). However, within this position, they still emphasize some unique features of their products, such as low weight and the uniqueness of their raw materials, and the importance of service features such as delivery reliability. They also express an ambition to move into higher-end segments, at least in certain by-products.
Group C – “the industry giants”, consists of three very large companies (C1, C2, and C3). They all have a high degree of vertical integration; they own forests and produce bulk products, such as raw materials (wood), energy products, cellulose products and pulp, as well as wood products, paper and packaging materials. While scale is very important for the bulk products, and a definitive competitive advantage of these “giants”, all companies in Group C pursue a differentiation strategy. They focus on quality and quality consistency in combination with knowledge, service, delivery reliability and a high degree of customer adaptation, including products that are designed together with the customers. With regard to quality, the companies highlight the specific characteristics of their wood fibres (length and purity), which result in strong and light paper and packaging materials with good optical properties. They also emphasize the importance of other product features, for example structural and surface properties. Similar to Group A, they still make efforts to reduce costs, for example by making their processes more efficient (C1, C2, C3) and optimizing transports (C3). However, in contrast to Group A, the companies in Group C own their own forests, which is an important competitive advantage considering that raw materials make up a large share of the product costs (up to 85% depending on the product). The companies in Group B have a broad scope in all dimensions: product markets, market segments, and product portfolios.

<table>
<thead>
<tr>
<th>Company</th>
<th>Main competitive strategy</th>
<th>Product market</th>
<th>Segment</th>
<th>Product portfolio</th>
<th>Vertical integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Differentiation</td>
<td>Focus</td>
<td>Broad</td>
<td>Focus</td>
<td>-</td>
</tr>
<tr>
<td>A2</td>
<td>Differentiation</td>
<td>Focus</td>
<td>Broad</td>
<td>Focus</td>
<td>Integrated</td>
</tr>
<tr>
<td>A3</td>
<td>Differentiation</td>
<td>Focus</td>
<td>Broad</td>
<td>Focus</td>
<td>-</td>
</tr>
<tr>
<td>B1</td>
<td>Low cost</td>
<td>Focus</td>
<td>Focus</td>
<td>Focus</td>
<td>-</td>
</tr>
<tr>
<td>B2</td>
<td>Low cost</td>
<td>Focus</td>
<td>Broad</td>
<td>Focus</td>
<td>Integrated</td>
</tr>
<tr>
<td>C1</td>
<td>Differentiation</td>
<td>Broad</td>
<td>Broad</td>
<td>Broad</td>
<td>Integrated</td>
</tr>
<tr>
<td>C2</td>
<td>Differentiation</td>
<td>Broad</td>
<td>Broad</td>
<td>Broad</td>
<td>Integrated</td>
</tr>
<tr>
<td>C3</td>
<td>Differentiation</td>
<td>Broad</td>
<td>Broad</td>
<td>Broad</td>
<td>Integrated</td>
</tr>
</tbody>
</table>

With regard to resource position, the three strategic groups share some resource advantages with each other and other companies located in Sweden and Scandinavia: access to high-
quality raw materials (long wood fibres\(^5\)) and relatively cheap energy. The companies’ existing process equipment (pulp and paper production machines), is also an important resource for all groups, although it (as will be discussed later) influences them in slightly different ways.

However, there are also differences between the three groups with regard to which key resources, capabilities and complementary assets they emphasize. The three “segment players” in Group A all stress the importance of their existing plants, which are a source of competitive advantage (A1, A2) but also limits what the companies can do (A1, A3). Companies A1 and A3 have also invested in their own energy plants to get control over their costs. They have limited access to capital, which makes it difficult (or even impossible) for them to make large-scale investments in new equipment. With regard to competences and capabilities, Company A1 and A3 have engineering knowledge and market knowledge related to their existing products and customers. They have the capability to successfully produce and develop their existing products, but do not have in-house research and development resources. This is also reflected in their complementary assets, where contracts, relationships and collaborations with suppliers of raw materials and chemicals as well as existing customers are of special importance. Most notably, both mention that they use their customers’ plants for test runs of modified or new products. Company A2 similarly emphasizes the importance of understanding how to produce products, which is difficult for competitors to imitate. However, in contrast to the other two companies in the group, it seems to have a wider competence base. For example, it highlights the importance of understanding “the whole chain of different types of knowledge, from research results to upscaling to industrial production to marketing”, including how the materials it produces can be converted into end products by its customers. In terms of complementary assets, it primarily emphasizes its R&D collaborations.

The two “commodity suppliers” in Group B both describe their existing plants, including auxiliary facilities such as harbours, as an important infrastructure that both aid and to some extent constrain them. Another similarity to Group A is that access to capital for large investments is limited and/or dependent on decisions by parent organizations abroad. They also discuss the importance of having access to raw materials (wood) and consider it a

\(^{5}\) One of the companies’ business is based on recycled fibres, but the Swedish system for collection and pre-treatment of such fibres is also well developed compared with other countries.
weakness that they do not have any forest holdings. Both companies have been in the industry for a long time and have built competence and credibility because of that, especially with regard to engineering and process competence. However, Company B2 has recently moved into a new product market and is still struggling a bit with building the right competences to be able to compete on quality instead of cost there. In terms of complementary assets, they stress the importance of contracts and relationships with suppliers of wood, chemicals and process equipment as well as collaborations with customers, which is similar to Group A. In contrast to Group A, however, they also highlight the regional and national research infrastructure.

The three “industry giants” in Group C are all very capable actors. Similar to the other groups, they emphasize that raw materials are of great importance in terms of both quality and cost, but in contrast to the others, they all have large forest holdings. These are at the heart of the companies’ strategies. Similar to the other groups, the process equipment is considered an important asset. However, the companies in Group C seems to focus more on the knowledge embedded in the process, for example related to chemicals and recipes, than on the machines as such. As explained by Company C, “the products are easy for an imitator to understand, but the craftsmanship involved in producing them is difficult”. In relation to this, they emphasize the knowledge and experience base they have built up over time, which is both broad and deep and spans past, existing and new business areas. With regard to capital, they have much larger assets than the other groups. They also have much more human resources, related to R&D (e.g. development engineers and researchers), operations (e.g. process engineers), and marketing. With regard to complementary assets, they have long-term relationships with their suppliers and customers – just as the other groups. However, compared with the other groups they seem to go further downstream to access application knowledge or even collaborate with end customers (brand owners). They also collaborate directly with research institutes and universities and sometimes also with entrepreneurial companies.

To sum up, the pulp and paper companies in this study can be divided into strategic groups based on their competitive positions. There are clear similarities within these groups in terms of the main basis for competition (low cost vs. differentiation) and scope. There are differences between the groups with regard to the companies’ resource position, but also some similarities that cut across the groups. The pulp and paper industry is a resource-based process industry. It is therefore not surprising that raw materials and process equipment are important resources for all companies. However, they do not create the same competitive advantage for
all groups. The quality of the Swedish/Scandinavian fibres is of more importance to Group A and Group C, which compete on differentiation, whereas Group B’s concern over its lack of forest ownership clearly reflects its cost focus. With regard to process equipment, the machines as such are clearly important to Group A and Group B, whereas Group C (and to some extent also Group A) emphasizes the knowledge and experiences needed to use the machines to produce products. Again, this seems to match the differentiation strategy of Group C (and Group A). Groups A and B are similar in terms of their core competences and capabilities and complementary assets, which might reflect their similarities in terms of narrow product market focus. The main difference seems to be that the companies in Group B put a larger emphasis on the regional/national knowledge infrastructure, possibly because they are located in a region with a long history of strong research institutes and pilot/demonstration plants related to pulp and paper (Hellsmark et al., 2016). The companies in Group C stand out in terms of their large and broad resource and competence base and they also make use of a wider set of complementary assets, reaching further downstream than the other groups. This seems reasonable, considering that they have much broader product market and customer segment scope as well as a higher degree of vertical integration than the other companies.

Taken together, this seems to indicate that both competitive strategy and resource position matter for the companies’ competitive strategy and there is also a clear relationship between competitive position and resource position, as evidenced by the intra-group similarities and inter-group differences. However, with regard to Groups A and B the analysis does not provide any clear answer to the question of the relative importance of the two positions, i.e. which of them drives the other. In contrast, the companies in Group C explicitly consider their resources – the forest and the fibres – the core on which their competitive strategies are based.

4.1.2 Innovation strategies

With regard to the innovation strategy dimensions relating to competitive position – product innovation, process innovation and technology leadership – the segment players in Group A share many characteristics. Their innovation efforts are mainly focused on developing existing products further, with the purpose of reducing the amount of raw materials needed (A1), improving the functionality and performance of the products (A2, A3), or adapting the products to new applications (A1). If they develop entirely new products, these are within the same basic product category as the existing ones (e.g. fine paper or packaging materials) and tend to build on changes in existing materials or processes (e.g. chemical recipes). They do
engage in some process innovation, but this is for the most part done to support product modifications (A1) or increase efficiency and improve profitability (A3). The companies in Group A are not overall technology leaders, but they aim at being first or at least early in their particular segments or niches. They describe how they need to be innovative to keep and stay relevant for the customers (A1, A2), to compete with larger actors (A2) or to keep up with changing regulations (A3), and can provide examples of products.

The commodity suppliers in Group B have quite different innovation strategies from a competitive positioning point of view. After diversifying into a new product market some years ago, Company B1 is now focused on finding ways to increase the added value of its main product and find new applications for the residual streams from its process, through both product and process innovation. In contrast, Company B2’s product and process innovation efforts are mainly focused on achieving cost reductions and improving by-products. Both companies are technology followers rather than leaders.

Finally, the industrial giants in Group C are engaged in a wide variety of innovation activities. With regard to product innovation, Company C1 is mainly focused on developments in its existing product areas, in terms of improvements of existing products, development of new materials to be used in existing products and development of new products. In addition to such activities, companies C2 and C3 are also involved in diversification to new product markets, for example biofuels and ‘green’ chemicals. With regard to process innovation, all three companies make process improvements to increase (cost) efficiency and product quality. They also adapt existing processes or develop entirely new process technology to be able to produce new products. With regard to technology leadership, Company C3 is the industry’s undisputed technology leader and is recognized as such by the other companies. The other two companies in Group C are fast followers. As explained by Company C1, they are not first but are big enough to catch up quickly. A summary of innovation strategy dimensions related to competitive position can be found in Table 3.

Table 3. Innovation strategy dimensions related to competitive position

<table>
<thead>
<tr>
<th>Company</th>
<th>Product innovation</th>
<th>Process innovation</th>
<th>Technology leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Existing products categories (and new markets/applications)</td>
<td>Process development to support new products</td>
<td>Niche/segment leader</td>
</tr>
<tr>
<td>A2</td>
<td>New generations of existing products to current markets</td>
<td>Quality upgrades in conjunction with investments to increase capacity.</td>
<td>Niche/segment leader</td>
</tr>
</tbody>
</table>
### Materials with new and better functionality

<table>
<thead>
<tr>
<th></th>
<th>Existing product categories</th>
<th>Continuous process adjustment</th>
<th>Niche/segment leader</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A3</strong></td>
<td>Continuous process adjustment</td>
<td>Niche/segment leader</td>
<td>Follower</td>
</tr>
<tr>
<td><strong>B1</strong></td>
<td>Transition to new type of pulp (historically) Development of existing products to increase added value New applications for residual streams</td>
<td>Process development to improve products</td>
<td>Follower</td>
</tr>
<tr>
<td><strong>B2</strong></td>
<td>Improvements in product quality and efficiency (cost reduction). Development of improved by-products</td>
<td>Small process adjustments Pilot plant for cleaning of by-product.</td>
<td>Follower</td>
</tr>
<tr>
<td><strong>C1</strong></td>
<td>Improvements of existing products New products in existing product areas New materials for existing products.</td>
<td>Process improvements to improve efficiency and product quality Equipment up-grades. New processes to support product diversification</td>
<td>Fast-follower</td>
</tr>
<tr>
<td><strong>C2</strong></td>
<td>Development of existing products Diversification to new product markets</td>
<td>Process improvements Process development (new plants). New manufacturing technology</td>
<td>Fast-follower</td>
</tr>
<tr>
<td><strong>C3</strong></td>
<td>New applications for existing products Development of existing and new products within main product market Diversification to new product markets</td>
<td>Process improvements and upgrades New or adapted processes to support new products. Pilot and demonstration plants</td>
<td>Technology leader</td>
</tr>
</tbody>
</table>

The remaining part of this section will be focused on resource position within the innovation strategy dimension – degree of ambidexterity, integration vs separation between exploitation and exploration and internal vs external sourcing.

With regard to the degree of ambidexterity, the segment players in Group A showed clear signs of combination between exploitation and exploration. In terms of exploitation, all three companies had a precursor of building further development on existing resources, such as existing machinery and infrastructure (A1, A2, A3), brand name and customer relations (A1), or knowledge and competences throughout the entire value chain from understanding the results of early research to marketing (A2). As a result, innovation focus was defined in terms of activities that allow building on existing resources which in many cases implied further development within existing product segments through the introduction of new and improved product qualities (A1, A2, A3) and development of more resource-efficient processes (A3).

At the same time, all three companies also showed characteristics of exploration strategy by following market- and policy-related precursors for product development and innovation. For
example, for Company A1 the development towards new markets and products was a part of the formal company strategy and resulted in an active search for new, growing market areas where Company A1 could enter while keeping to build on existing machinery. As a result, they started developing new types of products (though still within the broad area of paper and packaging products) where they faced the challenge of not being able to use previous experience and the need to learn new markets.

With regard to integration vs separation between exploitation and exploration aspects, the segment players showed clear integration tendency in how they discussed the selection of future development alternatives. As discussed above, the exploration and exploitation aspects were considered together and the alternatives that allowed both entering a profitable market (exploration) and continue building on existing resources (exploitation) were preferred. Furthermore, the companies discussed integrating potential new products into existing value chains (A1, A2). Another sign of integration was the composition of boards responsible for development and innovation that involved representatives from both production and market and sales (A1, A3). At the same time, some separation could be seen in Companies A1 and A2 where dedicated entities were focussed on pure exploitation, while centralised R&D divisions integrated both exploitation and exploration.

In terms of sourcing, the segment players highlighted the importance of external sourcing through collaborations with both suppliers and customers. Company A2 demonstrated a wider external sourcing network by taking part in research collaborations and conducting venturing activities (buying relevant start-ups). At the same time, all three segment players showed the importance of internal sourcing. For example, Company A3 was internally driving small process and product adjustments which constituted a big part of their development activities.

The commodity suppliers in Group B at the time of the study had different innovation strategies from the resource perspective. Company B2 combined exploitation and exploration by choosing development directions that allowed reusing existing resources and eliminated options that challenged this possibility. Such limitations resulted in the innovation focus on improving existing products and increasing resource effectiveness. At the same time, the current paper board segment was chosen at least in part exploratively, by searching for a growing market among potentially feasible areas (i.e. where current facilities can be used).
As for Company B1, it showed mostly exploitation strategy centred primarily on the existing production process as well as other resources such as market and distribution channels. Therefore innovation focus was defined in terms of improving existing products based on the existing process. However, a more complete understanding of the strategy of Company B1 can be gained if a historical perspective is taken. In the beginnings of the 2000s, the company switched from paper pulp to dissolving cellulose. To exit the non-profitable paper pulp segment, Company B1 searched for an alternative with a growing market (exploration), yet sufficiently compatible with the existing process (exploitation).

With regard to separation vs integration, no signs of separation were highlighted in the interviews. Like at Group A, the commodity suppliers showed integration in how they chose further development directions, considering market needs and process limitations together.

In terms of sourcing, both commodity suppliers emphasized the value of external collaborations. For example, for Company B1 research collaborations with various research institutes were central, as well as close collaborations with customers including joint product development activities and partnerships to compensate for the lack of internal market knowledge.

Within the group of *industrial giants* the combination of exploitation and exploration is somewhat different. In terms of exploitation, like in other strategic groups, the ambition to reuse existing facilities and infrastructure is well pronounced (C1, C2, C3). However, other types of resources to build on are both more varied and more emphasized compared to other groups. The examples include customer relations (C1), market knowledge (C2, C3), specific properties of Swedish raw materials (C2, C3), product and technology competence (C2, C3), and capability to learn new areas (C3). In terms of exploration, the industrial giants highlighted market-related innovation precursors such as customer need and market requirements (C1, C2, C3). Importantly, these precursors were discussed in connection to exploitation ones, i.e. one needs not only to find a profitable market or satisfy a particular customer need, but also to do it smarter than competitors (C2) and make sure that a potentially new product can be integrated in the existing value chain (C1, C2).

The resulting innovations reflected this combination of exploitation and exploration precursors. A big part of innovation activities were discussed in connection to existing resources. Importantly, it included both smaller innovations within existing product segments.
(C1, C2, C3) and more radical technologies (e.g. nanocellulose) to be applied to existing businesses (C1, C3). Further, two companies in the group also discussed a more long-term innovation agenda which reflected the explorative ambitions to look beyond existing resources (green chemicals, C2) or work with technological breakthroughs (20% of development costs spent on new products for new markets, C3).

In terms of organizational separation vs integration, the industrial giants shared with Groups A and B the tendency to integrate both exploitation and exploration in selection of further development options. However, different from other strategic groups, the industrial giants showed more clear separation by distributing exploitation-driven development activities across the business divisions and limiting exploration activities to central R&D units as well as distinguishing between short-terms (exploitative) and long-term (explorative) innovation portfolios (C2, C3).

With regard to sourcing, the industrial giants were strong in terms of most aspects of external sourcing: they collaborated with suppliers for process development, had joint development project with customers, and participated in research collaborations. Further, both Companies C1 and C2 discussed outsourcing market research and Companies C1 and C3 used a venturing strategy (buying relevant start-ups). However, all three industrial giants highlighted the importance of internal product and technology competence. Even in cases of partnerships with external partners the internal competence was built overtime. A summary of innovation strategy dimensions repeated to resource position can be found in Table 4.

<table>
<thead>
<tr>
<th>Company</th>
<th>Degree of ambidexterity</th>
<th>Integration vs Separation</th>
<th>Internal vs External Sourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Market-driven exploitation</td>
<td>Integration with limited separation</td>
<td>Mix</td>
</tr>
<tr>
<td>A2</td>
<td>Policy-driven exploitation</td>
<td>Integration with limited separation</td>
<td>Mix with external domination</td>
</tr>
<tr>
<td>A3</td>
<td>Market-driven exploitation</td>
<td>Integration</td>
<td>Mix with internal domination</td>
</tr>
</tbody>
</table>

Table 4. Innovation strategy dimensions related to resource position
<table>
<thead>
<tr>
<th></th>
<th>Exploitation (historically – market-driven exploitation)</th>
<th>Integration</th>
<th>External:</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Market-driven exploitation</td>
<td>Mix, but internal technology and product competence</td>
<td>Integration and Separation</td>
</tr>
<tr>
<td>B2</td>
<td>Market-driven exploitation</td>
<td>Mix, but internal technology and product competence</td>
<td>Integration and Separation</td>
</tr>
<tr>
<td>C1</td>
<td>Market-driven exploitation</td>
<td>Mix, but internal technology and product competence</td>
<td>Integration and Separation</td>
</tr>
<tr>
<td>C2</td>
<td>Market-driven exploitation (highest exploration compared to all other companies)</td>
<td>Mix, but internal technology and product competence</td>
<td>Integration and Separation</td>
</tr>
<tr>
<td>C3</td>
<td>Market-driven exploitation</td>
<td>Mix, but internal technology and product competence</td>
<td>Integration and Separation</td>
</tr>
</tbody>
</table>

To summarize the findings across the three strategic groups in terms of resource positioning within innovation strategies, some cross-industry patterns can be noted. The most striking common pattern across all three groups is in terms of degree of ambidexterity, or to what extent and how exploitation and exploration are present and combined. Almost all companies can be characterised by a strategy where, first, both exploitation and exploration characteristics are present, second, the exploitation precursors and activities are somewhat more dominant compared to exploration ones, and third, exploration and exploitation precursors are considered simultaneously when choosing further development directions. This pattern is also confirmed by the results of the survey where 15 out of 24 respondents characterised the driving forces of their product and process development activities as both exploitative (in terms of reusing existing resources) and explorative (in terms of pursuing access to profitable markets). We term this type of ambidextrous strategy as a *market-driven exploitation* highlighting that, on the one hand, both exploitation and exploration activities are present and tightly integrated (which is crucial according to previous studies on ambidexterity), and on the other hand, the exploration aspect is not strong enough to qualify for full-scale ambidexterity as described in previous studies (Andriopoulos and Lewis, 2010, Raisch and Birkinshaw, 2008).

Market-driven exploitation as a dominant innovation strategy confirms previous studies of the pulp and paper industry highlighting the importance of existing resources in the development of new to the companies and to the industry products (Onufrey and Bergek, 2018). The two partial exceptions from this pattern are Company A2 characterised by policy-driven (sustainability message) rather than market-driven exploitation and Company B1 leaning...
today towards exploitation, but having gone through the market-driven exploitation phase over the past decades.

All in all, the analysis of innovation strategies in the pulp and paper industry showed that both competitive position and resource position are relevant to understand companies’ strategies, like in case of business strategies. The three strategic groups identified in the analysis of the business strategies could be applied to both dimensions: group-specific patterns and clear differences between groups were identified both in terms of competitive position and resource position (although several interesting industry-general patterns were identified within the latter dimension). Furthermore, there were some parallels between the two dimensions in terms of how different groups were positioned relative to each other. Thus, the within the resource position dimension, the findings showed that readiness to step outside traditional business areas and the degree of technological leadership grew from Group B to Group A and further to Group C. Similarly, in terms of resource position, the tendency to rely exclusively on external sourcing decreased while indicators of separation between exploitation and exploration increased from Group B, to Group A and further to Group C. As for the overall relation between the two dimensions of innovation strategy, it can be concluded that findings related to competitive position and to resource position partially confirm, and partially complement each other.

4.1.3 Relationship between business strategies and innovation strategies

In this section we analyse how innovation strategies of companies in the pulp and paper industry reflect their business strategies. A number of connections between the two types of strategies could be found within competitive position and resource position dimensions. Thus, we could find the influence from the competitive position of business strategy on the competitive position of innovation strategy and from the resource position of business strategy on the resource position of innovation strategy.

In terms of competitive position, it can be observed that companies having differentiation strategies (Groups A and C) tended to take technology leadership positions by striving to be the leader or fast follower in the industry (Group C) or in their respective segments (Group A). In contrary, companies pursuing cost leadership strategies (Group B) did not claim technology leadership ambitions. That finding is in agreement with the previous literature (cf. Zahra and Covin, 1993) and highlights the importance of unique product (or overall offer)
characteristics that required for both differentiation strategy and being at the forefront of technology development.

Another observation concerns the relation between the breadth in terms of product-markets and product portfolios and the types of introduced innovations. While the segment players active in niche markets (Group A) were found to be limited to innovations within the existing or closely related product categories, the industrial giants characterised by great breadth in terms of product market, market segments and product portfolios, could cover a variety of innovation types, from existing business areas to new product markets. This finding can be explained within a Schumpeterian view on innovation as recombination, where a larger scope logically gives a larger recombination potential. However, to understand how specifically different competitive positions limit or enhance different innovation possibilities, a closer need at the resource dimension is needed.

In terms of interconnection between business and innovation strategies within the dimension of resource position, several general patterns could be observed across all three strategic groups. With regard to business strategies, all studied companies were characterised by quite strong dependencies on such resources as existing plants and knowledge related to them, as well as forest raw materials. In innovation strategies, these resource dependencies were reflected in a specific form of ambidextrous strategy termed market-driven exploitation where the exploitative precursors co-existed with the explorative ones, but were somewhat more dominant.

With regard to the patterns specific for the studied strategic groups, the resource positions within business strategies seemed to affect the types of innovations pursued by companies. Thus, both companies in Group A and Group B (with an exception of Company A2) were characterised by limitations caused by existing production facilities, limited access to capital and limited internal R&D resources. As a result, the analysis of their innovation strategies showed a dominance of incremental innovations driven by existing resources. In contrary, companies in Group C were characterised by strong and varied capabilities (both broad and deep and spanning across several business areas), emphasis on competence with regard to existing facilities and strong internal R&D resources, which was reflected in development of both incremental and radical innovations driven by existing resources. Thus, the different innovation results were not due to different innovation strategies as such (all of them were found to pursue market-driven exploitation strategies), but due to different resource bases.
The above findings can also serve as an explanation to the above observation that only industry leaders with high breadth of product and markets could deliver innovations of high magnitude. A close look at their resources could confirm that indeed it was exploitation of wide range of physical resources and intangible competences that could allow for high innovation ambitions. That is an example of how the resource position serves as a means for realizing the competitive strategy (cf. Grant, 1991, Porter, 1991).

As the results of this paper show, combining the competitive position view and the resource-based view in a study of business and innovation strategies gave several advantages. First, the two perspectives provided complementary rather than the same views on business and innovation strategies and the interconnection between them. Thus, the three strategic groups were most evident from the perspective of competitive position, though the overall patterns were in general reflected within the resource position. At the same time, using the resource position helped highlighting and explaining several overall industry-level patterns that would not be as emphasized if only the competitive position view were used. Second, the resource-based view helped explaining some of the patterns traced within the competitive position view confirming the importance of resources in realizing the competitive strategies.

5. Conclusions and implications

The purpose of this paper was to investigate the relationship between business and innovation strategies in a time of industry transformation. The empirical case studied was the Swedish pulp and paper industry, which currently faces transformation pressures in the form of declines in established business segments and increasing demand from other industries in need of more sustainable input materials.

The first research question concerned the characteristics of the (new) business strategies of the pulp and paper industry and the relative importance of competitive position and resource position in this respect. The empirical analysis revealed three strategic groups, with different characteristics in terms of both competitive position and resource position and that both dimensions mattered for the companies’ business strategies. In addition, there was a clear relationship between competitive position and resource position. Companies with a differentiation strategy emphasized the importance of having access to high-quality input materials as well as knowledge and experience to produce products based on those materials, whereas companies with a cost leadership strategy emphasized their process equipment and
were concerned about their lack of forest holdings and the resulting high cost of input materials. Moreover, companies with a large resources base and access to complementary assets tended to have broader scope than companies with small or specialized resources. However, it was difficult to conclude if either competitive position or resource position was more important in general. Only one of the strategic groups (the industry giants) clearly emphasized one over the other, building their business strategy around their raw material resources (forest and fibres).

The second research questioned concerned the characteristics of the innovation strategies of the pulp and paper industry in terms of competitive position (i.e. technology leadership, product and process innovations) and resource position (i.e. the choice of one of forms of ambidexterity). The empirical study showed that the companies mainly differed with regard to competitive positioning, where there was a clear coherence between the different dimensions. For example, companies with a leader or fast-follower strategy developed new products to existing and new markets and engaged in process development to improve the quality of existing products and support the development of new ones, whereas companies with a follower strategy focused on developing their existing products for existing markets and engaged in process development to improve profitability and the quality of their products. With regard to resource position, the companies were more similar. In particular, all but one of them where characterized by ambidextrous strategies we termed market- or policy-driven exploitation, in which exploitation and exploration are present and integrated (although some degree of separation existed in some companies), but exploitation dominates over exploration. No clear-cut connection was found between competitive position and resource position, but together these dimensions provided a more nuanced perspective of the companies’ innovation strategies.

The third research question was how the innovation strategies of the pulp and paper industry reflect its (new) business strategies. The study confirmed the results of earlier, quantitative studies in that there was a clear relationship between business strategies and innovation strategies and complemented them by showing that this relationship did not only concern the competitive position dimension but also the resource position dimension. Indeed, the resource position dimension of the companies’ business strategies had a clear influence on their innovation strategies as a whole.
To sum up combining the competitive position and resource position views in a study of business and innovation strategies largely confirmed the findings of previous studies with regard to the relationship between business and innovation strategies. However, it also provided some new insights. First, the study showed that the two perspectives were indeed complementary and, for the most part, in line with each other. For example, the strategic groups derived from an analysis of business strategies from a competitive position perspective were reflected by the companies’ resource positions. Second, due to the qualitative nature of the study, the relationships between business and innovation strategies could be examined in more detail. This resulted in the identification of a new type of ambidextrous strategy and also highlighted the importance of companies’ resource positions to realize not only their business strategies but also their innovation strategies.

These conclusions has some implications for studies of industry transformation. While several previous studies have shown that companies in mature industries can and do innovate (cf. e.g., Berggren et al., 2015, Hansen and Coenen, 2017), this study provides more specific insights into how strategic considerations condition their willingness and ability to engage in product-market diversification and industry transformation. In addition, it provides a complementary explanation of the observed slow transformation pace of pulp and paper companies into biorefineries (cf. Hellsmark and Söderholm, 2017, Hansen and Coenen, 2017, Novotny and Nuur, 2013), highlighting the strains such a transformation puts on the involved companies in terms of the trade-offs involved in changing strategic direction while retaining core capabilities associated with the exploitation of existing assets.

References


