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Achieving Sustained Competitive Advantage in the Forest Products Firm: The Importance of the Resource-Based View

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ABSTRACT

Prior research on forest products firms has examined external factors and largely neglected the role of internal firm resources and capabilities in creating and sustaining competitive advantage. Although a small and emerging body of research has examined competitiveness, competitive advantage (CA), and sustained competitive advantage (SCA), the literature is fragmented. Moreover, it focuses on CA rather than examining SCA and provides few insights for managers. Thus, a systematic conceptual development of the role of firm resources and capabilities in creating and sustaining competitive advantage in the forest products firm is thought to be helpful.

The resource-based view (RBV) of the firm in the strategic management literature provides a theoretical lens to understand how firms could develop internal resources and capabilities and leverage them to achieve CA and SCA. In this paper, the perspective of the RBV is used to examine firm resources and capabilities and explain how they can be used in accordance with the attributes of the theory toward attaining SCA in the forest products firm. In doing so, constructs to which scholars have attributed competitiveness in the forest products sector are examined. The paper contributes to existing forest products literature in two major ways. First, our systematic conceptual framework helps to consolidate current nascent literature and stimulate future research in this important area. Second, we believe that our model will help managers to better understand and use core ideas of the RBV to develop and leverage resources and capabilities in order to create and sustain competitive advantage.

Keywords: competitive advantage, sustained competitive advantage, resource-based view, forest products firm, resources, capabilities

Background

The forest products industry is a major source of employment and is important for sustaining global economic growth. Individual firms, however, continuously face keener competition from both foreign competitors and substitute products (Lahtinen 2007, Tokarczyk and Hansen 2006). Rivalry

among domestic firms is not new either. Many firms are performing poorly or have failed due to increased international competition (LaBissoniere and Bowe 2006, Siry et al. 2006, Schuler et al. 2001). These failures could be due in part to the excessive emphasis on external factors – factors over which firms have limited or no control – rather than a focus on internal firm resources and capabilities that can be developed and leveraged to achieve sustained competitive advantage (SCA). Industry effects such as these can erode the competitiveness of firms and ultimately make them defunct. Firms need to identify sources of uniqueness and leverage their competences in facing competition.

The existing forest products literature on competitiveness, competitive advantage (CA), and SCA is fragmented. The literature contains some information on CA but lacks adequate information on SCA. Several researchers have examined resources that can contribute to CA and sometimes SCA but have not given a detailed explanation as to why such resources have such potential (e.g., Lahtinen 2007, Stendahl et al. 2007, Bull and Ferguson 2006, Tokarczyk and Hansen 2006, Korhonen and Niemelä 2004). So for managers, it is not clear which resources should be focused on in order to achieve SCA. For instance, the study by Korhonen and Niemelä (2004) revealed that company managers do not have a concrete way of knowing which resources actually contribute to SCA. This was evident, for example, in the assumption of most of the studied companies that economies of scale (specifically via mergers and acquisitions) is a source of SCA. As we explain later, factors such as economies of scale can be copied by others and therefore do not provide SCA.

Based on an examination of the current literature, it seems clear that comprehensive research is needed to explain the resource-based view (RBV) of the firm and help identify resources that can contribute to SCA in forest products firms. The RBV of the firm, one of the most widely accepted theoretical perspectives in strategic management, provides a theoretical lens that helps firms improve their competitiveness. It helps to identify and efficiently use the resources available internally in order to attain SCA (Acedo et al. 2006, Lado et al. 2006, Amit and Schoemaker 1993, Peteraf 1993, Barney 1991, Dierickx and Cool 1989). The RBV is prominent in research, teaching, and consulting and is empirically tested and accepted (Newbert 2007, Lahtinen 2007).

To stress the importance of internal firm resources, Roos et al. (2001) found that different groups of Swedish sawmills use varying production strategies that show differences in their value-added shares, size, productivity, and technical and economic activities. Another group of scholars reviewed research on competitiveness in the forest products sector and observed that in addition to external factors internal firm processes constitute a major source of competitiveness (Hoff et al. 1997). A recent study by DeLong et al. (2007) on competitiveness in the Canadian value-added wood products sector revealed that a firm's success is dependent on the specific situation that prevails in its internal environment. The issues raised above give an indication that firms in the forest products industry are not homogeneous (Barney et al. 2001, Barney 1991) and can be successful based on their specific internal conditions.

Although the existing forest products literature on competitiveness has primarily addressed CA, some work on SCA and the RBV has begun to emerge. Tokarczyk and Hansen's (2006) article on creation of intangible CA in the forest products industry focused on branding, an intangible resource, as a source of CA. This study is RBV related but it does not explain the RBV indicators that one would use to assess the importance of the resource. Korhonen (2006) discussed the importance of the

knowledge-based view (KBV) in achieving CA and/or SCA in large forest products firms. The author praised the KBV as a novel strategic tool on which very little attention has been given in the forest products sector, and encourages forest products firms and researchers to examine. Korhonen and Niemelä (2004) mentioned the importance of the RBV of the firm in achieving CA and/or SCA in forest products firms. Korhonen and Niemelä (2005) used tenets of the RBV to determine the capabilities that provide CA in the forest products industry, this provides the basis for a detailed discussion of the theory and its tenets so to more fully comprehend its application in the forest products sector.

In their recent research, Stendahl et al. (2007) mentioned the importance of the RBV. Lahtinen (2007) linked the RBV to the forest products sector to help understand the sources of CA but lacks a comprehensive explanation of the RBV. Bull and Ferguson (2006) also applied the RBV to explain innovation success but give insufficient information about the RBV itself. It is clear that some of these studies have brought to light the relevance of the RBV to the forest products sector. The gaps we found, however, indicate a need to discuss the full breadth of the theory as it relates to the forest products industry and to facilitate its application in management, teaching, and research.

Purpose of the Paper

We seek to (a) explain the importance of the RBV of the firm, (b) develop a coherent conceptual framework using the RBV that will help us distinguish between resources that provide CA and SCA and (c) explain how firm resources can be used in accordance with the attributes of the theory toward attaining SCA in the forest products firm. Our paper synthesizes the forest products literature on competitiveness and uses the RBV from the strategic management literature to make potent and practical proposals toward achievement of SCA in the forest products firm. We define and explain the RBV and its attributes, critical resources, the capabilities of forest products firms, core competences, and the importance of knowledge in relation to the RBV and SCA.

The paper contributes to the existing forest products literature in two major ways. First, our systematic conceptual framework helps to consolidate current nascent literature and stimulate future research in this important area. Second, we believe that our model helps managers to better understand and use core ideas of the RBV to develop and leverage resources and capabilities in order to create SCA. The rest of the paper articulates key tenets of the RBV, develops a framework, and illustrates how some concepts discussed in the recent forest products literature relate to the RBV.

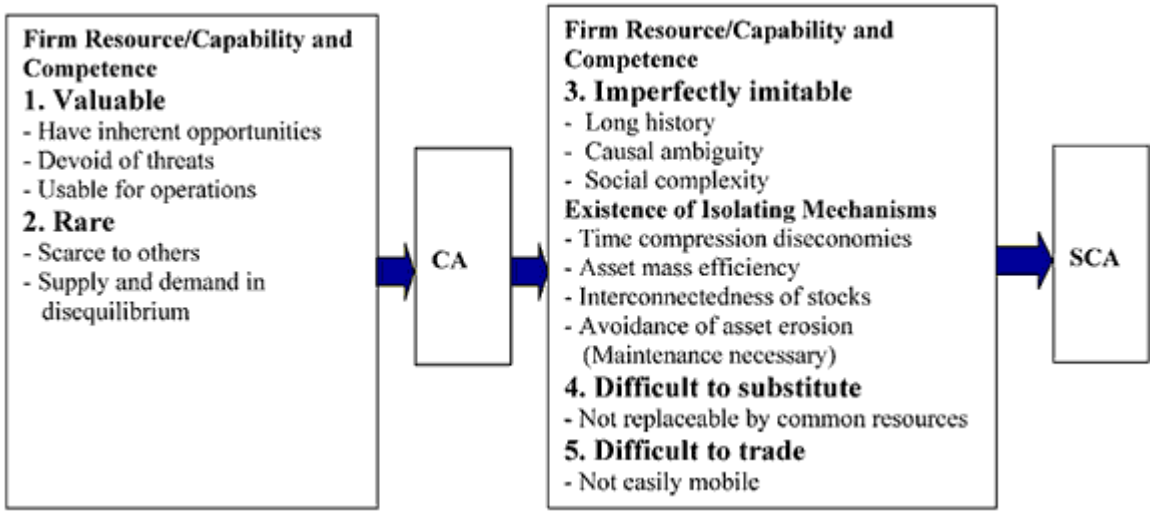
The RBV of the Firm

The RBV of the firm is a strategic management theory based on two main assumptions that help determine resources that provide SCA in firms. The first assumption is that firms within an industry or group may be heterogeneous with respect to the strategic resources they control. For example, in the forest products sector, although wood is the common raw material used in most processing, the resources of various firms are not the same. For instance, even wood raw materials vary in many ways from firm to firm. The second assumption is that resources may not be perfectly mobile across firms, and that, heterogeneity can be long lasting (Acedo et al. 2006, Lado et al. 2006, Bretherton and Chaston 2005, Amit and Schoemaker 1993, Peteraf 1993, Barney 1991, Dierickx and Cool 1989). These two assumptions indicate that every firm possesses unique resources that are not easily transferable to others. The RBV builds upon the 'strengths and weaknesses' of the strengths, weaknesses,

opportunities, and threats analysis, focusing more on the idiosyncratic attributes of the firm that raise its CA (Barney 1991, Wernerfelt 1984).

A schematic representation of the RBV and SCA is presented in **Figure 1**. Given the two premises, heterogeneity and imperfect mobility, the RBV suggests that resources/capabilities need to be valuable and rare in order to provide CA to firms. In order for the resources and capabilities to provide SCA, they further need to be difficult to imitate (ensuring factors inhibiting duplication), difficult to substitute, and difficult to trade. In the following section, we define and explain the RBV's key concepts and building blocks i.e., firm resources/capabilities, core competencies, CA, SCA, and conditions that enhance SCA.

Figure 1. A schematic representation of the RBV and SCA.



Valuable resources are those that can help an organization implement its strategies efficiently by exploiting opportunities and reducing threats in its environment. Rare resources are those that may not be available to all competitors and whose supply and demand relationship is in disequilibrium. Resources that are difficult to imitate are those that may not be able to be duplicated easily or cheaply. Resources that are difficult to substitute may not be the same as the resources of another firm (Hitt et al. 2007, Dollinger 2003). A resource that is difficult to trade is not easily mobile from its owner.

Firm Resources

Firm resources form the basis of the RBV. Amit and Schoemaker (1993) define firm resources as stocks of available factors that are internal and belong to the firm. Barney (1991) defines firm resources as all assets, capabilities, organizational processes, and information controlled by a firm that enable it to visualize, plan, and implement strategies and improve efficiency and effectiveness. He classified resources into three categories – capital resources, human resources, and organizational resources. Resources can be tangible (i.e., physical goods such as land, machines, buildings, inventory, and money) or intangible. Intangible resources are not physical and are created by the firm and its workforce, e.g., brand names, the firm's reputation, and intellectual capital (Hitt et al. 2007, Hill and Jones 2004). Firm resources become valuable if they are used efficiently. Firm capabilities play an important role in the deployment of resources and creation of CA.

Firm Capabilities

Firm capabilities are defined as a firm's ability to deploy resources (Amit and Schoemaker 1993) ' these are the skills that the firm applies to coordinate and make efficient use of resources (Hill and Jones 2004). Such skills are innate parts of the rules, routines, and procedures through which the firm makes decisions and manages its internal affairs (Hill and Jones 2004). Capabilities are information-based, tangible or intangible processes that are specific to the firm and developed over time. They are derived from developing, carrying, and exchanging information through the firm's human capital (Amit and Schoemaker 1993). There is sufficient evidence that capabilities of organizations are a greater source of SCA than are product markets (Eisenhardt and Zbaracki 1992). Capabilities could include organizational processes (such as learning or customer service) or inter-organizational processes and mechanisms such as the ability to maintain and leverage alliances and network of relationships with a variety of external partners such as suppliers, buyers, and even competitors (Gnyawali and Madhavan 2001).

Teece et al. (1997) further define the term 'dynamic capabilities' as a firm's ability to integrate (a static concept), build/learn (a dynamic concept), and reconfigure (a transformation concept) internal and external competencies to counter effects of fast changing environments. Dynamic capabilities thus show a firm's ability to develop innovative forms of CA emanating from its path dependencies and market positions.

Core Competencies

Core competence refers to activities that a firm does especially well, compared to its competitors. "Core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies" (Prahalad and Hamel 1990, pg. 1). A firm is said to have developed core competencies when it is able to blend its resources and capabilities uniquely and better than its competitors. Examples of core competencies in a typical forest products firm are the ability to produce superior products, the development of efficient marketing channels, excellent customer relationships, and marketing communication (Juslin and Hansen 2003). There are three characteristics that define a core competence: it offers potential access to a wide range of markets, contributes greatly to meeting customer expectations, and makes it difficult for competitors to imitate (Prahalad and Hamel 1990).

CA

CA refers to a situation where a firm crafts and implements a value creating strategy, which is not being implemented by any current or potential competitor (Barney 1991). Profitability emanates from CA (Hill and Jones 2004). Core competencies, resources and capabilities of firms are all important in crafting and implementing a value creating strategy that can provide CA (Tokarczyk et al. 2007, Hill and Jones 2004, Juslin and Hansen 2003). Resources that are both valuable and rare provide CA (Hitt et al. 2007).

SCA

SCA is the situation where a firm is able to craft and implement a value creating strategy, which is not at the same time being implemented by current or potential competitors, and the competitors are

not able to benefit from the results of the strategy (Barney 1991). Not all resources contribute to SCA. As stated earlier, valuable and rare resources contribute to CA. For SCA to be achieved, resources and capabilities should additionally be difficult to imitate, difficult to substitute (Acedo et al. 2006, Lado et al. 2006, Amit and Schoemaker 1993, Peteraf 1993, Barney 1991, Dierickx and Cool 1989), and difficult to trade (Peteraf 1993, Dierickx and Cool 1989) (refer to **Fig. 1**).

Several studies have indicated that firms with superior resources will earn sustainable rents (Majumdar 1998, Amit and Schoemaker 1993, Peteraf 1993, Dierickx and Cool 1989). Dierickx and Cool (1989) refer to these superior resources as the 'strategic factor market' – the market where the resources needed for strategy implementation are obtained. Amit and Schoemaker (1993) have used the term 'strategic assets' to denote resources that help achieve SCA. Itami and Roehl (1987) refer to consumer trust, brand image, control of distribution, corporate culture, and management skill as information-based invisible assets that are as important as the more visible resources but are even the most important resources for long-term success (SCA).

To ensure that the correct factors are employed, Dierickx and Cool (1989) warn that managers must be analytical in decision-making and have the ingenuity to deploy the correct resources considering the opportunity costs involved. They argue that the core indicators of SCA listed above are very important but "imperfectly imitable" is the most important factor. For example, if the ways by which a firm achieves its goals are too complex for competitors to copy, the firm enjoys an advantage over its competitors. But, once rivals are able to imitate the firm's capabilities and resources, it loses its superior position (Hitt et al. 2007, Hill and Jones 2004). Now, to help forest products firms attain SCA, it is important to discuss factors that reduce imitation of resources and capabilities by competitors.

Factors Inhibiting Imitation of Resources/Capabilities

Unique Historical Conditions

If a firm obtains its rare, valuable, and difficult-to-substitute resources through unique history or prior conditions, they become imperfectly imitable (Acedo et al. 2006, Dollinger 2003, Amit and Schoemaker 1993, Peteraf 1993, Barney 1991, Dierickx and Cool 1989). This is partially related to Nyrud and Baardsen's (2003) finding in their study about production and efficiency in the Norwegian sawmilling industry where mills that stayed in business for a longer time exhibited better efficiency. Harris et al. (2003) conducted an industry-wide survey of the forest products sector in the United States to determine the degree of wood procurement management systems developed to improve forest management on non-industrial private forestlands. The results show that large companies had better developed wood procurement plans than smaller firms. This ability to plan could be traced to the large companies' long life span of operation, availing to them a broader scope of resources (Harris et al. 2003, Henderson and Cockburn 1994).

Causal Ambiguity

Causal ambiguity refers to the extent to which the cause and effect link between the resources controlled by a firm and its SCA cannot be easily understood. If causal ambiguity is high, competitors cannot understand what resources are responsible for a firm's success (Acedo et al. 2006, Bull and Ferguson 2006, Dollinger 2003, Amit and Schoemaker 1993, Peteraf 1993, Barney 1991, Dierickx and

Cool 1989). As a result, resources and capabilities with high causal ambiguity cannot be easily imitated. Intangible resources and capabilities are more likely to be linked with high causal ambiguity.

Social Complexity

Social complexity is a phenomenon that makes resources imperfectly imitable because of their complex nature. Examples of such resources are interpersonal relations among managers and a firm's culture (Acedo et al. 2006, Dollinger 2003, Amit and Schoemaker 1993, Peteraf 1993, Barney 1991, Dierickx and Cool 1989). Relationship with customers, customer service and satisfaction, and closer interaction between marketing, design and manufacturing are other examples of resources and capabilities that are important in achieving CA in the forest products firm (DeLong et al. 2007, Gazo and Quesada 2005, Winistorfer 2005). Such relationships can be complex, and the inconspicuous social phenomena embedded in them can enhance a firm's competitiveness and even SCA.

Isolating Mechanisms

Isolating mechanisms refer to the characteristics of the process by which a resource was acquired (Peteraf 1993, Dierickx and Cool 1989). Dierickx and Cool (1989) assert that the SCA of firms depends on the relative ease, in terms of time or cost or both, with which competitors are able to imitate asset stocks by accumulating similar assets or substituting them with other assets. The following are the isolating mechanisms that make resources difficult to imitate.

1. Time compression diseconomies (TCD) – TCD indicates that it takes time to acquire asset stocks, giving early-movers an advantage. For example, crash research and development programs (done rapidly to achieve results in a minimum time frame) are normally less effective than programs with lower annual outlays but spread out over a relatively longer period (Dierickx and Cool 1989). The Trex brand of the Trex Company, which is a pioneer brand in some forest product categories, is a good example of time compression diseconomies (Tokarczyk and Hansen 2006). Being a pioneer enhances a firm's chances of meeting the five indicators of SCA. This behooves managers to be proactive in studying their environment and deploying the right resources at the right time ahead of competitors.

2. Asset mass efficiencies – Asset mass efficiency is the benefit that accrues from resource aggregation. It buttresses the importance of sustainability on the basis that firms that have enough assets stand a better chance of adding increments to the resource base e.g., research and development (Dierickx and Cool 1989). Adsorptive capacity, a firm's ability to value, assimilate and commercially use new external knowledge and predict future technological advances is a demonstration of asset mass efficiencies (Todorova and Durisin 2007, Lane et al. 2006). This means that the richer the knowledge pool and its ability to improve the efficiencies of existing technologies, the greater the firm's motivation to invest in R&D (Lane et al. 2006). Historical success translates into future success (Lahtinen 2007, Korhonen and Niemelä 2005, Henderson and Cockburn 1994, Dierickx and Cool 1989).

3. Interconnectedness of asset stocks – The greater the connections between various resources and capabilities, and complex interplay between them, the greater the likelihood of attainment of SCA. Managers must recognize that most resources do not function in isolation (Dierickx and Cool 1989). For instance, communication between product manufacturers and

market personnel needs to be efficient and up-to date to ensure that the right products get to consumers in their most needed form. Winistorfer (2005) advises closer interaction between marketing, design, and manufacturing.

4. Lack of asset erosion – Asset erosion is the depreciation of assets. All assets, whether physical, or intangible decay unless there is regular maintenance and continual renewal through expenditure (Prahalad and Hamel 1990, Dierickx and Cool 1989). For example, physical assets depreciate, research and development becomes obsolete as technology evolves, and even brand awareness deteriorates as the consumer population is non-sedentary (i.e., some consumers leave the market while new ones enter, and existing ones may even forget about the brand) (Dierickx and Cool 1989). Youngs and Hammett (2001) assert that firms which use obsolete equipment perform poorly – this is an example of the consequences of asset erosion. For SCA to be achieved, resources and capabilities need to be continuously renewed and improved.

We have provided a detailed explanation of the RBV and its attributes. The factors that help firms to avoid imitation of their resources have also been well-explained. In the next section, the literature on CA and SCA and the RBV in the forest products firm is reviewed and a framework of resources that provide CA or SCA in the forest products sector is developed.

Competitive Advantage, Sustained Competitive Advantage and the RBV in the Forest Products Firm

Some Constructs of CA and SCA in the Forest Products Literature

Many research studies have identified that it is important for a forest products firm to focus on continual quality assurance, productivity improvement, value addition, and workforce development in order to be competitive (DeLong et al. 2007, Nagubadi and Zhang 2006, Gazo and Quesada 2005, Winistorfer 2005, Hansen et al. 2002, Vuorilehto 2002, Roos et al. 2001, Hansen and Bush 1996). Firms must not only add value, they must reinvent it in order to achieve sustained performance. The success of IKEA is based in part on its consistent production of high-quality Scandinavian designs (Normann and Ramirez 1993).

Capacity to innovate is an intangible resource, which is important for competitiveness in the forest products sector (DeLong et al. 2007, Stendahl et al. 2007, Bull and Ferguson 2006, Cao and Hansen 2006, Korhonen 2006, Gazo and Quesada 2005, Korhonen and Niemelä 2005, Winistorfer 2005, Segura-Bonilla 2003, Hansen et al. 2002, Hoff et al. 1997). Some of the innovative activities in the forest products industry include product development (Stendahl et al. 2007, Bull and Ferguson 2006, Cao and Hansen 2006), curve sawing (Carino et al. 2006), lean manufacturing (Cumbo et al. 2006), forest certification (Owari et al. 2006), and branding (Tokarczyk and Hansen 2006). Others include better ways of using the scarce raw material and improved manufacturing processes and work ethics (Mara 2003, Baldwin 1984). The efficacy of all of these factors to contribute to SCA in the forest products firm depends on their ability to meet the implications of the five indicators of SCA.

Knowledge of workers in the form of foreign know-how (knowledge about foreign competitors), technical know-how, and competency in performance is important in achieving CA in forest products firms (Gazo and Quesada 2005, Winistorfer 2005). Generally, well-planned and coordinated internal

firm processes help firms to attain CA (Gazo and Quesada 2005, Hoff et al. 1997). Other complex activities may include doing what others cannot do (e.g., niches, customer service, quick delivery, just-in-time shipments, outsourcing, and setting up regional sales offices (Hansen et al. 2002, Roos et al. 2001, Schuler et al. 2001). IKEA has maintained a strong and reputable relationship with its suppliers by appointing a group of engineers for specifically addressing critical problems (e.g., standards and technical) faced by its suppliers. This has markedly contributed to its success (Normann and Ramirez 1993).

An example of customer service in the U.S. kitchen cabinetry sector is the inclusion of a design service in the package to assist customers in installing the product (Gazo and Quesada 2005). IKEA's success is partly attributed to the high level of customer service they provide for their knockdown furniture kits which customers transport and assemble on their own (Normann and Ramirez 1993). Some authors (e.g., Nyrud and Baardsen 2003, Schuler et al. 2001) have observed that economies of scale is a source of CA in the forest products firm. It may not be a source of SCA, however, unless it is able to meet all of the criteria for achieving SCA.

Hansen et al. (2002) listed the following as potential sources of CA in softwood sawmills in western North America; quality of products, customer relationships, effective personal selling, market share, and aggressive credit policy. Others are effectiveness of marketing channels, competitive price, well-known product brand, transportation expertise, research and development, and environmental friendliness of products. DeLong et al. (2007) identified cost factors, supply chain efficiencies, innovation, human resources, market orientation, and differentiation as sources of CA in their recent study of the Canadian value-added wood industry. Korhonen and Niemelä (2004) revealed that the prerequisites for SCA include focus on niche markets, motivation of employees, innovation, and customer orientation. When factors such as these are specific to the firm making it difficult for others to imitate, firms could earn sustained rents. Thus far we have identified some constructs to which CA and SCA have been attributed in the forest products firm. Next, we use the RBV lens as presented in our framework to discuss how certain resources and capabilities could be sources of SCA.

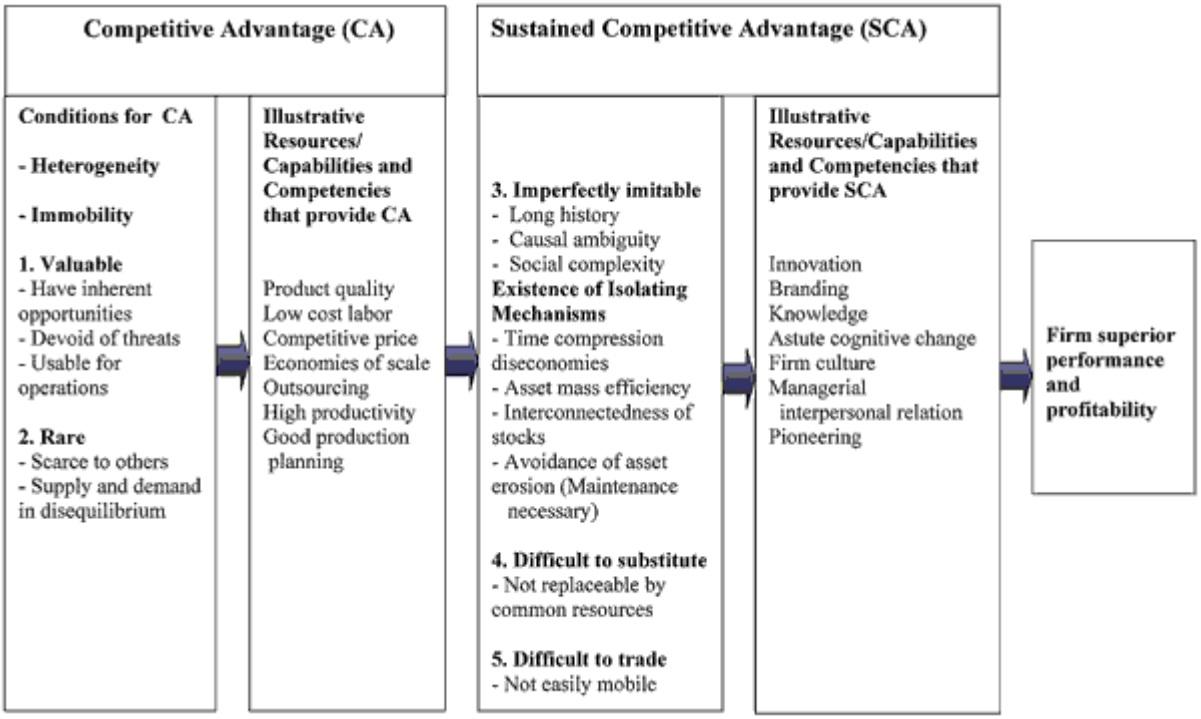
Using the RBV Lens to Discuss Some Constructs of SCA

As noted earlier, the forest products literature has addressed several issues relevant to firm CA that are related to the RBV. In the following section, we use the RBV lens to discuss some constructs from the forest products and strategic management literature which are potential sources of SCA in the forest products firm. **Figure 2** provides an illustrative framework. As we discussed earlier, resources that contribute to CA are invariably valuable and rare. Those that contribute to SCA are difficult to trade, difficult to substitute, and difficult to imitate in addition to being valuable and rare. From this blueprint one can analyze and thus attempt to determine which resources provide CA or SCA. Some resources and capabilities that provide CA also provide SCA depending on the circumstances under which they exist and are used. A firm that enjoys SCA enjoys an eventual superior performance and profitability.

Most of the constructs that provide SCA are intangible resources e.g., innovation, knowledge, customer service/relationship, astute cognitive change, firm culture, and branding. This inference is evident because of the causal ambiguity, social complexity, or historical conditions that surround the formation and use of these resources. All five indicators of the RBV are important to ensure attainment

of SCA. In the next section we discuss the potential resources that provide SCA in the forest products firm.

Figure 2. Illustrative framework of resources/capabilities contributing to CA and SCA in the forest products firm.



Potential Sources of SCA in the Forest Products Firm

Innovation

Innovation is an important RBV element. Rogers defines innovation as “an idea, practice or object that is perceived as new by an individual or other unit of adoption” (Rogers 2003, pg. 12). Innovation can take several forms, e.g., a new product, service, technology, administrative practice, or research finding (Hage 2005). An innovative product is new if it has lower costs, improved attributes, and other new attributes that did not previously exist. Alternatively, if the new idea was used before, but now used in a different application, it is an innovation (Hill and Jones 2004, Afuah 1998). The origin of innovation is usually unknown to competitors. It is ambiguously formed through asset mass efficiencies of specialized knowledge, time compression diseconomies, and social complexity, and through all other duplication-inhibiting factors that make it difficult for competitors to comprehend. These factors lead to firm innovation and innovativeness as being valuable, rare, difficult to substitute, difficult to trade, and hard to imitate and thus potent in providing SCA.

Branding

In their recent study, Tokarczyk and Hansen (2006) explained the importance of branding, an intangible resource in the forest products sector, as a source of CA. They described the case of Trex Company, a structural forest products firm in the residential, commercial decking, and railing business whose branding strategy promotes product differentiation of Trex in a market that is not generally

characterized by brand identification (Tokarczyk and Hansen 2006). Because the Trex brand was started when no other firms were using a branding strategy (favoring time compression diseconomies), it is valuable and may not be substitutable (due to its unique nature) or easily tradable, and hence the firm is enjoying a CA in branding. If this becomes difficult to imitate, the company will enjoy SCA from the Trex brand.

Knowledge

Knowledge, in any form (e.g., management, manufacturing, technical, and customer service at all hierarchical levels), improves firm performance and can be a source of SCA (Korhonen 2006, Bontis et al. 2002, Grant 1996). Knowledge resides in the heads of individuals, in team processes, and in organizational processes, systems, and routines. Knowledge embedded in organizational systems is rather difficult for competitors to imitate (Grant 1996, Simon 1991). The critical input in production and primary source of value is knowledge (Bull and Ferguson 2006, Grant 1996).

Some examples of knowledge are tacit/implicit and explicit/codified knowledge. Explicit/codified knowledge is easily transferable in a formal or systematic language (Bull and Ferguson 2006, Grant 1996, Nonaka 1994). Tacit knowledge has a personal quality, making it difficult to formalize and communicate. It is grounded in action and commitment and relevant in a specific context. Tacit knowledge is two-fold: technical and cognitive elements. The cognitive elements are referred to as 'mental models' – picturing the world by forming and manipulating opinions and analogies (e.g., schemata, paradigms, beliefs, and viewpoints) that help individuals explain phenomena (Nonaka 1994). The technical element of tacit knowledge concerns know-how, crafts, and skills that are relevant to specific contexts. Tacit knowledge is more difficult to transfer than explicit knowledge. Transferability of knowledge depends on how fast it can be aggregated e.g., idiosyncratic knowledge is more difficult to aggregate and transfer than open access knowledge (Tokarczyk et al. 2007, Bull and Ferguson 2006, Korhonen 2006, Grant 1996, Zander and Kogut 1995, Itami and Roehl 1987), which is a public good. Based on the RBV, idiosyncratic knowledge is more likely to lead to SCA than open access knowledge.

A firm is able to use its available capabilities efficiently if it can integrate the specialized knowledge of its employees into its operations. This illustrates the importance of asset mass efficiencies and interconnectedness of asset stocks. Identifying people as a resource, Baldwin (1984) points out that good leadership in the forest products firm is necessary for good performance and urges managers to identify the capabilities of employees through legwork, extensive interviewing, careful observations, and one-on-one interaction. Managers should then encourage small group meetings and allocate each employee to their areas of excellence (Baldwin 1984) as has occurred in IKEA (Normann and Ramirez 1993).

The higher the level and sophistication of common knowledge among a team, the more likely integration will be efficient. The broader the scope of knowledge integrated within a capability the more difficult it is to be imitated by rivals, and causal ambiguity increases. Knowledge is the basis for understanding recent organizational innovations and developments. When knowledge in the firm is manifested in forms that are ambiguous as described above, it becomes difficult for competitors to comprehend, substitute, and imitate, contributing to achievement of SCA (Hitt et al. 2007).

Cognitive Change

Another important factor that can create ambiguity and boost firms' CA is cognitive change in response to environmental conditions. Individuals are known for limited data processing capabilities. At the same time, they are continuously faced with ambiguous data (Barr et al. 1992, Eisenhardt and Zbaracki 1992). Managers rely on simplified representations or mental models to understand the various types of problems and environmental conditions confronting them (Nonaka 1994). Particularly common with mental models is the phenomenon of cause-effect understanding about the environment and its effect on the organization. Mental models determine which information needs attention, indicating that other useful issues could be skipped depending on what managers see as important.

Organizational renewal hinges on learning involving changes in mental models. Mental models that no longer address current issues need to be discarded and new models developed to address current issues (Gnyawali and Stewart 2003, Barr et al. 1992). The process undergoes the stages of unfreezing/unlearning, change, and refreezing. In the unfreezing/unlearning stage, old beliefs are discarded and room is made for new comprehensions; this process nurtures and protects core competencies (Prahalad and Hamel 1990). In the freezing phase, newly gathered knowledge solidifies (freezes) (Korhonen 2006, Barr et al. 1992). In effect, these attributes of cognitive maps should enhance strategic decision-making, which is important with respect to the actions taken, the resources invested, or the precedents set (Eisenhardt and Zbaracki 1992). The knowledge renewal process is a core competence which emerges over time through the organizational process of accumulating and learning how to deploy different resources and capabilities (Hitt et al. 2007).

It is important for managers to look beyond reach by creating products and services that consumers want but have not yet imagined (Prahalad and Hamel 1990). To this end, managers are encouraged to engage in strategic decision-making that bears in mind possible contingent decisions from competitors that could incapacitate their decisions, in order to counteract those possibilities. This type of decision-making eliminates any blind spots (competitor reaction) that could jeopardize the manager's decision (Zajac and Bazerman 1991). Such tactics of decision-making can make a firm's operations ambiguous, indecipherable and imperfectly imitable by competitors and lead to SCA.

Discussion and Conclusions

Studies on competitiveness in the forest products sector have focused more on achieving CA rather than SCA and have shown that firms need consistent criteria for assessing the potency of resources that contribute to SCA. Attempts have been made recently to introduce some aspects of the RBV to address ways of achieving SCA. The research, however, has been incomprehensive and fragmented and does not bring key tenets of the RBV to the context of forest products firms in detail. Our goal in this paper is to fill these important gaps. We have explained in detail the RBV and its attributes, developed systematic conceptual frameworks to stimulate future research, and provided useful guidelines for researchers and managers.

Firm resources, capabilities, and core competencies are important factors that ensure the CA and SCA of firms. There are basic resources that each firm must possess in order to operate. Some of these are money, machines, humans, land, energy, and other necessary equipment. These resources are common to all of the firms and may contribute to CA but not SCA. Most of the resources that contribute

SCA are invariably invisible and intangible. They are innate parts of the firm and must be identified, developed, and efficiently deployed. As discussed earlier, they include: innovation, branding, knowledge, astute cognitive change/decision-making, well-planned and coordinated internal firm processes, market niches, and excellent customer service. These resources and capabilities help achieve SCA because they are complex, ambiguously formed, and meet several key indicators of SCA as discussed above. That means they are more likely to be valuable, rare, difficult to substitute, and difficult to trade, and most importantly, imperfectly imitable.

For resources to become imperfectly imitable they could have been gathered through history. Resources that provide SCA must also be characterized by causal ambiguity and social complexity to avoid their copying. Finally, it is important that managers in the forest products firm keep renewing and maintaining all assets under their control to avoid obsolescence and depreciation.

This work contributes to the existing forest products literature in two major ways. First, it provides a systematic conceptual framework – a useful lens through which current research can be understood and future research advanced. It has introduced and explained the RBV, a state-of-the-art perspective in strategic management used to coherently and systematically assess which firm resources contribute to attainment of CA and SCA. The paper has discussed the differences between the two firm target goals (CA and SCA) and the resources that are important in achieving each.

Secondly, the paper provides useful guidelines for managers. It has used the indicators of the RBV to analyze and provide several well-argued and practical examples of the factors responsible for SCA in the forest products firm. It has proposed models that show which resources can contribute to CA and/or SCA. Managers should strive to work toward creating unique, valuable, and rare resources and capabilities, and establishing conditions that inhibit competitors from understanding such resources and how they provide SCA.

By building on the conceptual framework and arguments developed in this paper, future research could more thoroughly examine resources and capabilities in the forest products sector. It will be helpful to perform a thorough content analysis of the forest products literature by deeply examining all types of resources in the forest products sector, categorizing them into resources and capabilities, and examining conditions that are relevant to CA and SCA. Future research could also examine factors that inhibit duplication of stocks (e.g., time compression diseconomies, asset mass efficiencies, interconnection of asset stocks, prevention of asset erosion, causal ambiguity, social complexity, and attributes of complex firm culture).

We hope that the conceptual model developed in this paper will help stimulate RBV-related research on forest products firms and provide guidelines for managers to develop and leverage resources that contribute to SCA within their firms.

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