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INNOVATION STRATEGY, WORKING CLIMATE, AND FINANCIAL PERFORMANCE IN TRADITIONAL MANUFACTURING FIRMS: AN EMPIRICAL ANALYSIS

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In this study, we address the effect of innovation strategy and an innovative working climate on financial performance in the Norwegian wood industry. Innovation strategy embodies four dimensions: the degrees to which innovation in the form of products, processes, and business systems are embedded in the management values and priorities as well as the degree of expenditure in R&D. An innovative working climate is exemplified by team cohesion, supervisory encouragement, resources, autonomy, challenge, and openness to innovation. Previous studies have indicated a lack of research in traditional manufacturing firms on both innovation strategy and a supportive working climate. Our survey was answered by 241 CEOs. The connectional model was tested with structural equation modelling, and all hypotheses received support. This result implied that innovation strategy and an innovative working climate enhanced financial performance in traditional manufacturing firms.

Keywords: Innovation strategy; innovative working climate; financial performance; manufacturing firms; wood industry.

Introduction

Growing attention is being paid to innovation and creativity as success factors for sustainable competitive advantage and financial performance. Innovation, which denotes the creation of something new, has been studied for decades (Zaltman *et al.*, 1973). In this study, innovation is defined as the propensity of firms to create and/or adopt new products, manufacturing processes, and business systems.

Many researchers have performed studies on innovation strategies (Akman and Yilmaz, 2008; Cooper *et al.*, 2004; Fruhling and Siau, 2007; Jenssen, 2004; Jenssen and Randøy, 2002, 2006; Lawson and Samson, 2001). These studies have considered the links between innovation strategy and innovativeness, and, in some cases, between innovation and financial performance (Calantone *et al.*, 2002; Hult *et al.*, 2004; Wheelwright and Clark, 1992; Zangwill, 1993). Although most researchers claim that having an innovation strategy positively affects financial performance, the studies have shown mixed results (Jenssen and Åsheim, 2010).

An innovative working climate has also been considered as an important antecedent to innovativeness (Amabile *et al.*, 1996b; Cooper *et al.*, 2004; Deshpandé and Farley, 2004; Ekvall, 1996). Although Deshpandé and Farley (1999a) found that an innovative working climate produces a positive effect on financial performance, previous research has paid little attention to investigating this relationship. Wei and Morgan (2004) investigated peer-to-peer supportiveness in organisational climates but found no direct effects of such supportive climates on performance. However, Wei and Morgan (2004) did find a positive relationship with market orientation as a mediator effect. Despite a number of studies concerning innovation strategy and innovative working climates and their effects on performance, the literature that includes both factors in an integrated manner remains rather limited.

One stream of literature concerning innovation strategy does not include the importance of the working climate, which can be seen as a precursor or promoter of innovativeness (i.e., an attitude towards innovation) (Akman and Yilmaz, 2008; Jenssen and Randøy, 2002, 2006). The second stream of literature, which addresses an innovative working climate for innovation, neglects the importance of applying an innovation strategy (Amabile, 1997; Amabile *et al.*, 1996a). Specifically, even if the working climate is supportive of innovation, the innovation may fail and any positive effects on financial performance may not be realised if the management has not contributed to developing an innovation strategy. On the other hand, if management acts according to an ambitious innovation strategy, they depend upon an innovative working climate among employees to realise the innovation and the expected financial performance. From a manager's point of view, simultaneously developing an innovation strategy and an innovation climate is vital to success.

The literature has demonstrated the impact of country-specific factors that influence the success of innovations (Lee *et al.*, 2000). The literature has also shown that the type of industry and the firm size are important to the working climate (Reynolds, 1986; Damanpour, 1987). Jenssen and Randøy (2002, 2006) investigated several factors that impact innovation and found a positive effect from innovation strategy. However, they investigated larger firms in the shipping

industry, and their findings may not be applicable to traditional manufacturing firms. Also, they did not include the effect of working climate in their studies.

Based on the above discussion, this study investigates the direct effects of innovation strategy and an innovative working climate on financial performance in the context of traditional Scandinavian manufacturing firms. Because the wood industry is a relatively homogeneous, mature industry, we minimised variations due to unknown variables by conducting the study entirely in the context of the Norwegian wood industry. With this study, we sought to give more validity to the innovation strategy — innovative working climate performance relationship and extend it to new contexts.

In the next section, the theoretical background for this work is presented, and the two main hypotheses are proposed. These hypotheses are based on a model in which innovation strategy and innovative working climate both influence a firm's financial performance. The methods of the study are introduced, including information about the empirical setting, measurements, questionnaire development, sampling, and data collection, and the non-response bias test. The analyses are described, and the hypotheses are tested using structural equation modelling. Both hypotheses were found to be supported, and the results and their implications are discussed.

Theoretical Background and Hypotheses

Innovation

Innovation is closely related to the economic objective of creating differentiation (i.e., enhancing the monopolistic power of the firm in relation to its customers) (Porter, 1980; Schumpeter, 1934). Innovation has been studied in many fields and can be classified along several dimensions, including novelty or newness (Tidd and Bessant, 2009), and can be classified by whether it is directed towards the product, production process, market segment, and/or business system (Jenssen and Nybakk, 2009; Jenssen and Randøy, 2002, 2006). According to Damanpour (1991), previous studies have emphasised the importance of distinguishing between different types of innovation because it helps in identifying the determinants of innovation (Jenssen and Nybakk, 2009; Jenssen and Åsheim, 2010).

The relationship between innovation and financial performance has a long history (Schumpeter, 1934, 1942). Thus, a large body of research regarding this relationship exists and has found that innovation is a key component for long-term firm success (Hult *et al.*, 2004; Wheelwright and Clark, 1992). In addition, several scholars argue that innovative businesses are more successful than others (e.g., Calantone *et al.*, 2002; Deshpandé *et al.*, 1993; Grønhaug and Kaufmann, 1988). However, research has also shown that innovation can be risky and that failure is

the most likely outcome of, for example, product innovations (Cooper, 2001). Furthermore, West and Farr (1989) argued that the benefits of innovation vary and may not accrue at all. Other scholars have argued that the relationship can be U-shaped, with high and low levels of innovation likely resulting in the highest performance (Cooper and Brentani, 1991).

A firm's culture and strategic orientation probably affect the forms of innovation that the firm is most likely to successfully accomplish (Deshpandé *et al.*, 1993). Additionally, research seems to indicate that firms, which are innovative in several ways, receive the highest scores in terms of financial performance (Deshpandé and Webster, 1989).

Innovation strategy

As previously noted, innovation is believed to positively influence financial performance. An important question, therefore, is whether a conscious strategy for innovation is conducive to innovation (Zahra and Das, 1993). Drucker (1993) argued that successful innovations most often result from conscious, purposeful searches for innovation opportunities. In agreement with this argument, Jenssen and Randøy (2002) found that a clear strategy for innovation is the most important predictor of innovation in shipping firms. Based on previous innovation research in other business contexts, it seems plausible to argue that a clear dedication to innovation increases the level (Akman and Yilmaz, 2008; Zahra and Das, 1993) and success of innovation (Lawson and Samson, 2001).

The literature provides several explanations why strategy may stimulate activities such as innovation. The mechanisms that are thought to operate depend upon the approach to strategy that is applied. Strategy is often supposed to create organisational direction by charting the course of the firm's effort, by focusing the effort through promoting coordination, by providing people with an easy way to understand the organisation and by providing consistency and reducing ambiguity (Mintzberg *et al.*, 2009).

It has also been argued that involvement in the strategy process may increase innovation (Jenssen and Randøy, 2002). The arguments concerning the formulation of strategy and involvement in the strategy process may be linked to the innovation adoption literature, which often assumes a positive relationship between the adopter's preferences and the probability of innovation adoption (McDade *et al.*, 2002). In other words, a conscious innovation strategy and involvement in the strategy process probably reflects the adopter's (management and employees) preferences and makes it easier to adopt the innovation. According to Ahuja (2000), a diversification strategy may stimulate innovation through cross-fertilisation of ideas while simultaneously contributing to bureaucratisation and

development of control procedures that counteract innovation (See also Cohen and Levinthal, 1989).

An innovation strategy is a structural support for innovation. Development of an innovation strategy improves the management of a firm's innovation capabilities (Fruhling and Siau, 2007). With an innovation strategy, the formal setting for innovation and a firm's commitment to innovation are identified and formalised. A formalised approach to innovation then increases the likelihood of having an effective system for innovation (Van de Ven *et al.*, 2000) and creates a competitive advantage (Jenssen and Randøy, 2006). To confirm this view, many researchers have focused on innovation strategy in recent years (Cooper *et al.*, 2004; Fruhling and Siau, 2007; Jenssen and Randøy, 2002, 2006). Importantly, an innovation strategy must reflect the long-term direction and scope of the organisation (Cooper *et al.*, 2004).

An innovation strategy might focus on several different areas (Pearson, 1990; Zahra and Das, 1993). Jenssen and Randøy (2006) mentioned new product development, cost reduction, differentiation, continual quality improvement, increased sales in existing markets, and entry to new markets. Zahra and Das (1993) distinguished among four conceptual dimensions: innovation leadership, types of innovation, sources of innovation, and the level of innovation investment in firms. Akman and Yilmaz (2008) followed Venkataraman (1989) and included six characteristics: Aggressiveness, analysis, defensiveness, futurity, proactiveness, and riskiness. Whatever focus the innovation strategy takes, management's commitment to innovation is conducive to innovative success (Crespell and Hansen, 2008). In this study, innovation strategy is defined as a concept that embodies four dimensions describing the degree to which innovation in the form of (1) products, (2) processes, and (3) business systems are embedded in the unit's management values and priorities as well as (4) the degree of expenditure in R&D.

Innovative working climate

Intangible assets, specifically employee knowledge, are considered crucial for a firm to gain competitive advantages (Deshpandé and Farley, 2004; Patterson *et al.*, 2004). According to West and Farr (1989:23), "innovativeness is a quality shared by most or all professional and managerial workers, and that, given the appropriate facilitating environments, individual innovativeness is likely to be enacted in the work environment." Hence, it is vital to know how to create an appropriate facilitating environment that fosters innovation and creativity among employees.

One component of the work environment is a firm's organisational climate. Studies have shown that a favourable work climate can foster innovation (Tidd and Bessant, 2009). This study uses organisational climate, working climate, and

climate for innovation interchangeably. As the terms climate and culture are often used interchangeably, it is important to differentiate between these two concepts. In this study, climate characterises life in the organisation, including the employees' behaviours, attitudes, and feelings (Ekvall, 1996). Culture is seen as the structuring force of the organisation's life and represents the deeper and more enduring values, norms, beliefs, symbols, rules, and thoughts that exist among the employees in an organisation (Deshpandé and Webster, 1989). While cultural values are more enduring, climate is more easily modified (Tidd and Bessant, 2009).

Amabile *et al.* (1996) claimed that perceptions of the work environment can influence the level of creativity in an organisation and, hence, the innovation. This is because the level of creativity depends upon a person's level of motivation, and a person's level of motivation depends upon the work climate (among other factors). Factors in the work environment can therefore both impede and support the creativity of the employees. Amabile *et al.* (1996) developed a componential theory and model consisting of five conceptual properties of a work environment hypothesised to influence creativity. These five conceptual properties of a work environment were encouragement of creativity, autonomy or freedom, sufficient resources, positive challenges/pressures, and organisational impediments to creativity.

In Tidd and Bessant (2009), creative climate was one of the components assumed to influence innovation (i.e., key features of a creative climate can represent a positive approach to forming creative ideas when supported by relevant motivation systems). Amabile *et al.* (1996) stressed the importance of motivated individuals in achieving a creative climate. Moreover, several studies have investigated the antecedents to an innovative working climate. For instance, Sundgren *et al.* (2005) studied the pharmaceutical industry and found that information sharing and intrinsic motivation are important qualities of an innovative working climate.

Tidd and Bessant (2009) emphasised six factors that they claimed were critical for a climate that fosters innovation: trust and openness, challenge and involvement, support and space for ideas, conflict and debate, risk-taking, and freedom. Trust and openness refers to how safe the participants consider their relationship with management. Challenge and involvement refers to how a firm involves employees in the daily operations, long-term goals, and visions of the firm. Support and space for ideas concerns the amount of time employees and leaders are given to innovate. Conflict and debate is due to the presence of personal, interpersonal, or emotional tensions. Risk-taking relates to how much leeway is given to risk-takers. In other words, if management allows unconventional ideas with uncertain outcomes, then employees are not hesitant to share their thoughts

and opinions. Employee freedom concerns the degree to which employees can choose their tasks and the way that those tasks are performed.

There are many similarities between Amabile *et al.* (1996) and Tidd and Bessant (2009) regarding what is important to creating a climate of creativity. Other researchers have emphasised similar variables as crucial to creating a climate of creativity that can foster innovation. Specifically, West and Farr (1989) mentioned autonomy, resources, cohesive group work, clear feedback, participative leaders, group/organisational support for innovation, challenging tasks, time, and little work overload as facilitating factors for innovation by individuals and groups. Several other researchers mentioned employee autonomy, feedback from leadership and leadership support for the individual, sufficient resources, organisational structure, clear vision and alignment of the leadership and employees around the vision, and visible pro-innovation behaviour as particularly important factors of an innovative climate (Kanter, 1983; West and Farr, 1989). Hence, although studies of the climate necessary for innovation have been performed with different methods and at different times, the properties of a climate that supports innovation are more or less the same.

Crespell and Hansen (2009) performed a comprehensive review of the literature in the field and concluded that six dimensions were the most important indicators of a climate of innovation: Team cohesion, supervisory encouragement, resources, autonomy, challenge, and openness to innovation (Amabile, 1988; Amabile *et al.*, 1996; Crespell and Hansen, 2009). Crespell and Hansen (2009) eventually dropped the dimension 'challenge' due to poor psychometric properties.

Team cohesion

According to Tushman and Anderson (2004, 239), team cohesion is 'the degree to which members of the group are attracted to each other,' 'the resultant of all forces acting on all members to remain in the group,' and 'the total field of forces that act on members to remain in the group.' In other words, where team cohesion is high, the members of the team feel comfortable and satisfied in the group and will work hard to support the group and its members. Rogers (1954) agreed and further said that there is a high degree of cohesiveness in a group in which the members feel safe in sharing new ideas and proposals. However, in highly cohesive groups, there exist the pitfalls of excessive conformity and limited creativity (West and Farr, 1989). According to an alternative stream of research, a safe environment actually inspires creativity (West and Farr, 1989). Thus, where there is cohesiveness in combination with critical attitudes regarding the quality of task performance, there will a positive drive toward innovation (West and Farr, 1989), which will lead to an improved financial performance (Calantone *et al.*, 2002;

Crespell and Hansen, 2008; Hult *et al.*, 2004; Wheelwright and Clark, 1992; Zangwill, 1993).

Supervisory encouragement

According to Amabile *et al.* (1996), supervisory encouragement is important because it makes employees more secure in themselves and the jobs that they do. The fear of negative criticism is basically nonexistent in firms in which superiors are encouraging; hence, employees feel no fear of presenting new ideas. For a supervisor to be encouraging, it is essential that goals be clarified. Additionally, open interaction between leadership and employees helps the employees understand what is occurring and what to expect. The leader must also give support to a team's work and ideas, show confidence in the group, and value individual contributions. Therefore, where the factors mentioned above are present, the supervisor will act as a good working model and provide the encouragement to the employees necessary to foster innovation (Amabile, 1997; Peters and Waterman, 1982; West and Farr, 1989).

Resources

Resources refer to all components that an organisation makes available to performers of innovative work tasks (Amabile, 1997). Employees need access to sufficient resources to be creative and to create a climate of innovation. Resources include appropriate access to funds, materials, facilities, knowledge, information, sufficient time to produce novel work in the domain, and the availability of training (Amabile, 1997; Amabile *et al.*, 1996b). It is also important to have sufficient resources for innovative problem solving (West and Farr, 1989). Several researchers have claimed that the resources earmarked for a project, guide the project's creativity level (Cohen and Levinthal, 1990; Damanpour, 1991). In addition to the natural limit that resources impose on what a project can achieve, there is likely also a psychological effect of resource availability. For example, a project that is given a large amount of resources is often regarded as more important than a project that receives just enough to fulfil the task (Amabile *et al.*, 1996b).

Research on productivity slack may shed light on the relationship between resources and innovation. A slack in productivity may allow organisations to experiment with different strategies and innovative projects that might not have been possible in a resource-constrained environment (Cyert and March, 1963; Goes and Park, 1997). On the other hand, slack may diminish incentives to innovate and promote undisciplined investment in R&D activities that rarely yield

economic benefits (Jensen, 1986, 1993; Leibenstein, 1969). Nohira and Gulati (1996) found that there was an inverse U-shaped relationship between slack and innovation in organisations; both too much and too little slack may be disadvantageous to innovation. In addition, slack fostered greater experimentation but also diminished discipline in innovative projects, resulting in the observed curvilinear relationship.

Autonomy

Autonomy (or freedom) refers to the employees' sense of control and ownership over their own work (Amabile, 1997) and encompasses the sense of control and ownership that both an individual and a group feel. The degree to which someone feels free in their daily work depends on how many decisions can be made independently. For example, freedom includes the ability to act and make decisions without the consent of a supervisor and the ability to have an influence on goals and means. Other factors are the opportunities to choose team members and set time limits. Greater autonomy implies that an employee or a team can make more decisions independently. Therefore, if a firm wants to create a climate of innovation, it is essential that its employees can affect their own day-to-day work. Creativity and innovation are fostered in organisations in which the employees or teams have a high degree of autonomy (Amabile *et al.*, 1996b; Bailyn, 1985).

Openness to innovation

A firm that is open to innovation is open to change and willing to try new ideas and take risks. An open firm will encourage and support creativity and innovation through fair, constructive judgment of ideas (Crespell and Hansen, 2008). Additionally, there will be rewards and recognition for creative work. The firm will have mechanisms for developing new ideas, an active flow of ideas, and a shared vision of what the organisation is trying to do (Amabile, 1997). For a firm to be regarded as open, it needs a basic organisation that extends throughout the whole firm, from top management to 'blue collar' workers.

Hypotheses

The proposed model is composed of two independent relationships. First, it investigates the link between an innovation strategy and financial performance. Then, it investigates the link between an innovative working climate and financial performance. For instance, Jenssen and Randøy (2002, 2006) and Jenssen and Åsheim (2010) looked at the link between innovation strategy and innovation, and Crespell and Hansen (2008) looked at the links between innovation strategy,

innovation, and financial performance. Interestingly, all studies found positive relationships. In this study, however, innovation itself was not directly considered. Instead, the model in this study investigates the link between innovation strategy and financial performance because the measurement scale for innovation strategy in this study implied that a firm with an innovation strategy was prioritising innovation and, hence, was likely to be innovative.

Jenssen and Åsheim (2010) emphasised the challenge of using innovation as an intervening variable between, for instance, strategy and performance in surveys based on rather unpredictable performance sequences. This unpredictability is inherent in the path from strategy to actual innovations and then to realised financial performance. This problem was reduced to some extent in the present study because we did not consider the time at which the innovations were commercialised. We just posited as a prerequisite that an innovation strategy will eventually lead to innovation and performance and that firms with such a strategy will therefore be better off than those without (similar logic can also be applied to other factors).

The relationships among working climate, innovation, and financial performance have been addressed in previous research. For example, West and Farr (1989) looked at working climate and innovation, mentioning the possible economic benefits that innovation could bring. Crespell and Hansen (2008, 2009) investigated working climates for innovation through organisational commitment to innovation, as well as through innovativeness and financial performance. Deshpandé and Farley (1999a), in contrast, looked directly at the link between a climate that encouraged innovation and financial performance. All the studies indicated (to some degree) that an innovative working climate positively influences financial performance, either directly or through mediating factors.

This study hypothesises that an innovation strategy and an innovative working climate will both have a positive impact on financial performance. Two hypotheses were subsequently drawn from the model and presented in the following chapters.

Innovation strategy and financial performance (H1)

As discussed previously, the literature suggests that a formalised approach to innovation in the form of a strategy increases the likelihood of a systematic and effective system for innovation (Van de Ven *et al.*, 2000), the level of innovation (Akman and Yilmaz, 2008; Zahra and Das, 1993) and the success of innovations (Lawson and Samson, 2001). These increases arise from creating direction, focusing effort, providing consistency, and reducing ambiguity, among other factors (Mintzberg *et al.*, 2009). Finally, innovation strategy might be a step towards creating a competitive advantage (Jenssen and Randøy, 2006; Zahra and

Das, 1993). For example, Jenssen and Randøy (2006) tested the relationships between several different strategies and innovativeness in highly differentiated and poorly differentiated firms. The results showed that an innovation strategy of some kind promoted innovation in both types of firms. According to Cooper *et al.* (2004), there is a clear relationship between having a new product strategy and positive financial performance. Fruhling and Siau (2007) performed a qualitative study and found that the firms with the strongest innovation strategy performed best. These conclusions support the following hypothesis:

H1: *The degree to which a firm has an innovation strategy is positively related to a firm's financial performance.*

Innovative working climate and financial performance (H2)

According to West and Farr (1989), most workers will be innovative given the appropriate environment or working climate. As discussed above, several studies have suggested that an innovative working climate is an organisational variable that exerts both direct and indirect effects on financial performance (Crespell and Hansen, 2009). In addition, Deshpandé and Farley (1999b) found that a positive organisational climate was related to better performance. Deshpandé *et al.* (1993) also found the same results, although organisational climate was not measured explicitly in that particular study. These researchers used different measures than this paper, but they had the same focus: Openness, trust, decentralisation, and participation. These arguments support the following hypothesis:

H2: *The degree to which a working climate is innovative is positively related to a firm's financial performance.*

Methods

This study used a survey in the form of a questionnaire and thorough hypothesis testing. As shown in the preceding chapter, our two models built on causal theories, and none of the variables could be observed directly. Therefore, these higher-level constructs must be represented by empirically observed variables. The models consisted of two hypotheses that were tested with the help of structural equation modelling. This section will first describe the research design in more detail and give the empirical setting chosen for the study. Then, the measurement methods will be described, followed by the questionnaire development, sampling, and data collection. At the end of the section, general issues related to validity, reliability, and statistical tests are presented. See also Nybakk *et al.* (2011) and Nybakk (2012) for more details.

Empirical context

The context of this study was the Norwegian wood industry and included sawmills, planning mills, laminated wood factories, furnishings and wood products producers, and producers of paper, cellulose, wood chemical products, and wood pulp and fibreboard. Craft firms and sub-vendors were also included in this study. House construction and intermediate stages, such as wholesaling and retailing, were not included in the sample. The wood industry is seen as a conservative industry with a relatively low degree of innovation. However, several wood-industry-specific studies have indicated that there are positive links between innovation, innovativeness and financial performance (Knowles *et al.*, 2008).

There are several reasons for the selection of the Norwegian wood industry. First, focusing on this industry ensured a certain isolation of the study and minimised variation from unknown variables (Sande, 2008) through investigation of a homogeneous industry with a long tradition. Second, to ensure adequate variation in the variables, the industry had to be heterogeneous. The Norwegian wood industry was seen as an industry that would fulfil both demands. This industry is homogeneous because the same raw materials are being used and the end market is most often the building products market (Sande, 2008). It is at the same time an industry composed of a variety of firms that produce many different products, from simple components to complicated products, such as furniture and stairs. See Hansen *et al.* (2006) for a literature review on innovation research applied to the wood and forest industry. Finally, and maybe most importantly, this industry represents a conservative, low-tech industry and therefore differs from the more high-technology, knowledge-intensive industries frequently studied in the innovation literature (see, for example, Akman and Yilmaz, 2008; Jenssen and Nybakk, 2009). This research has a special interest in understanding businesses in the wood industry and seeks to hopefully shed light on processes within other traditional manufacturing firms that have long traditions (e.g., food, fish farming, textile, packaging, and machinery) but perhaps not the same level of innovation.

Measurement

Innovation strategy

The innovation strategy scale measures management's commitment to innovation through four items based on the work of Crespell and Hansen (2008). Three of the items concern product, process and business systems innovation, while the fourth item concerns R&D in the firm. The purpose of this scale is to measure how a firm prioritises innovation either directly or through R&D. The four items were transformed into statements with identical wording: 'We give priority to product

innovation', 'We give priority to innovation in manufacturing processes' and so on. A seven-point Likert scale was used to measure the items, ranging from one (low prioritisation) to seven (high prioritisation).

Innovative working climate

The scale is a modified version of the componential model of organisational creativity and innovation developed by Amabile (1988) and Amabile *et al.* (1996) and also used by Crespell and Hansen (2008). Five of Amabile (1988) and Amabile *et al.* (1996) eight dimensions were used. These five dimensions were team cohesion, supervisor encouragement, autonomy, openness to innovation, and resources. Each dimension was measured using two items/statements. In addition, the questionnaire was examined and commented on by several people with specialised skills and knowledge in the field, both from academia and industry. A seven-point Likert scale was used to measure the five first-order indicators, ranging from one (strongly disagree) to seven (strongly agree).

Financial performance

Several methods of measuring a firm's organisational performance have been developed (Dess and Robinson Jr., 1984). However, performance is a complex and multidimensional phenomenon, so it is difficult to find accurate ways to measure it. Dess and Robinson Jr. (1984) performed a study that compared subjective measures to objective measures. They used a three-step approach to test the correlation between objective and subjective measures of return on assets (ROA), sales growth, and overall financial performance. Both objective and subjective measures of the ROA and sales growth were used in addition to two measures of overall financial performance. The measures of overall financial performance were compared to the objective and subjective ROA and sales growth. Dess and Robinson Jr. (1984) found that a firm's subjective perceptions of how well it had done over a specific time period were in agreement with the objective measures of change in ROA and sales. They were also in agreement with the firm's subjective evaluation of overall financial performance. Finally, it was stated that subjective performance measures were probably the most appropriate for examining relative performance within an industry (Dess and Robinson Jr., 1984).

Following this study, numerous scholars chose to use subjective measures in relation to competitors in the industry to determine how a firm performed financially (Hansen *et al.*, 2006). In this study, four items were used to measure the financial performance of the respondents. These items were return on sales, sales growth rate, after-tax ROA, and overall competitiveness (Dess and Robinson Jr., 1984; Hansen *et al.*, 2006). The items were measured using a self-rated subjective

scale, as the respondents were asked to rank their facility into one of seven categories based on how their facility compared with competitors in the industry.

Questionnaire development

A questionnaire was developed and consisted of five different parts: Learning orientation, innovativeness, innovation strategy, working climate, and financial performance. In addition, questions were asked about job title, average annual sales in the business for the last three years, when the firm was established, the number of employees in the firm's production division, and what products the firm produced. At the end of the questionnaire, there was an open space in which respondents could write any additional comments.

All questions (items) were derived from earlier studies (see previous chapter) that existed only in English. Therefore, the questionnaire was translated into Norwegian. Although all of the questions were from previous studies, the questionnaire was tested on several researchers before distribution. Furthermore, the questionnaire was thoroughly scrutinised by a vice president of a firm in a corresponding industry. Because all of the questions were derived from earlier studies, a full pilot study was not conducted.

Sampling and data collection

Although the wood industry is a relatively large industry in Norway, a limited number of firms exist. Sande (2008) used several different sources to create an overview of all of the firms and found 887 businesses in Norway. At that time, the wood products industry (about 20 firms) was not included in the list. However, Sande (2008) included construction of houses, cabins, office buildings, bridges, and similar projects. This study considers neither the construction stage nor the intermediate stages, such as wholesaling and retailing. The final target group for this study thus consisted of approximately 500 firms.

To obtain the best possible sample of the furniture industry, the four most relevant special interest organisations were contacted. With the exception of the furniture industry, we received access to membership lists that contained a large portion of the population of firms (approximately 100). Data collection was accomplished with the help of an electronic web survey. Because there was no access to the membership lists (including e-mail) for the furniture industry, two different collection methods were used, both of which were modified versions of the data collection design suggested by Dillman (1978, 2000).

A letter was sent to the CEOs of the furniture industry ($\sim$100 firms) with a request for a reply to the Internet study. A total of 36 answers were received. Four

hundred and twenty-one e-mails with a link to the web study were then sent to CEOs in the rest of the wood industry. After three reminders were sent to members of the furniture industry and the rest of the wood industry, there were 255 replies to 492 requests, for a total response rate of 52%. Of these, there were 241 usable responses. The others were discarded as the firm had only one employee because the corporate or main office responded instead of the production plant or division, or because the form was incompletely filled out, so the final adjusted response rate was 49%.

Non-response bias

In survey research, the concern that the respondents might be systematically different from those who did not respond always exists. Only an extremely high response rate could limit this concern, and bias may still exist even with a high response rate. We therefore tested for non-response bias using *t*-tests in which the earliest respondents were compared to the latest respondents with respect to variables including age, size, innovation strategy, innovative working climate, and financial performance (Armstrong and Overton, 1977). None of the tests were significant ($p > 0.05$), and there was thus no indication of nonresponse bias. The adjusted response rate of 49% was also relatively high for a survey of CEOs.

Analyses and Results

The measurement model

The proposed measurement model originally consisted of two first-order constructs (Innovative Strategy and Financial Performance) and one second-order construct (Innovative Working Climate). Innovative Working Climate consisted of five first-order constructs (Team Cohesion, Supervisory Encouragement, Resources, Autonomy, and Openness to Innovation). Due to the small number of items per construct, composites of the first-order variables were used, meaning that the original five first-order constructs that measured an Innovative Working Climate were combined into a single variable. The reason for combining these variables was to increase the reliability of the measurement through multivariate measurement (Hair *et al.*, 2010). Cronbach's Alpha test was also conducted to measure the reliability of this new measure. Cronbach's Alpha values between 0.6 and 0.7 are thought to represent a lower limit for acceptability. The results are presented in Table 1.

All variables had acceptable Cronbach's Alpha values, except for those related to Openness to Innovation. Openness to Innovation was therefore removed from the measurement model. The remaining composite variables (Team Cohesion,

Table 1. Reliability analyses of innovative working climate.

Items	Construct — Composites	*C*′s Alpha
Teams are committed to their work	Team cohesion	0.67
Communication is free and open within teams		
People feel that top management is enthusiastic and confident about their work	Supervisory encouragement	0.77
Supervisors support their teams within the organisation		
If people need information to do their work, it is readily accessible within the organisation	Resources	0.79
Generally, people can get the resources they need for their work		
Employees have the freedom to decide how they are going to do their work	Autonomy	0.79
Employees determine their own work		
New ideas are generally resisted (*R*)	Openness to Innovation	0.49
It is often difficult to carry out organisational changes (*R*)		

Note: *C*′s Alpha = Cronbach's Alpha; *R* = Reversed.

Supervisory Encouragement, Resources, and Autonomy) were calculated were calculated from the mean responses to the questions that are combined to form the composite variables.

The revised measurement model

The first-order factors of the revised measurement model were tested for convergent validity by looking at the loading coefficients or the standard factor loadings of all measured variables (items). All of the standard loading coefficients of the first-order factors were adequate, except for that of the variable Autonomy, which was therefore deleted. The*t*-values for the remaining variables varied from 8.3 to 27.4 and were statistically significant ($p < 0.01$). Thus, after the removal of Autonomy, the convergent validity of the variables was supported (Anderson and Gerbing, 1988).

To test for validity of the first-order constructs, the construct reliability and average variance extracted (AVE) were computed. Both measures varied among the first-order constructs. For Innovation Strategy and Financial Performance, the construct reliabilities were 0.97 and 0.98, respectively, whereas the construct reliability for Innovative Working Climate was 0.71. A construct reliability above 0.7 is considered to demonstrate good reliability, so all of the first-order factors had satisfactory construct reliability values. In comparison, the AVE of a variable

Table 2. Parameter estimates for measurement relationships in the model.

Constructs and Indicators	Std Loading	*t*-value
Innovation Strategy ($CR = 0.97$, $AVE = 0.46$)		
High priority on product innovation	0.71	A
High priority on innovation in manufacturing process	0.82	12.5
High priority on innovation in business systems	0.67	8.3
High priority on R&D to gain a competitive advantage	0.79	11.6
Working Climate ($CR = 0.71$, $AVE = 0.39$)		
Supervisor encouragement (a)	0.86	A
Team cohesion (a)	0.70	14.0
Resources (a)	0.68	10.4
Autonomy (a)	Deleted	
Financial Performance ($CR = 0.98$, $AVE = 0.57$)		
Return on sales (ROS)	0.87	A
Sales growth rate	0.79	16.7
After-tax return on assets (ROA)	0.87	27.4
Overall competitiveness	0.85	16.5

(a) = composites with two items

should not be below 0.5. Among the first-order constructs of the proposed model, only Financial Performance had an AVE above 0.5. For Innovation Strategy, the value was 0.46, and the AVE for Innovative Working Climate was 0.39, implying that the error in these two items is larger than the variance that can be explained by the latent factor structure imposed on the measurements.

The results of the tests of the first-order constructs are presented in Table 2. After testing for convergent validity of the first-order constructs, the fit of the final revised measurement model was tested. In the final revised measurement model, Innovative Working Climate was a first-order construct consisting of three variables. This measurement model exhibited an acceptable fit with a CFI of 0.97 and a RMSEA of 0.059.

The correlations among the constructs Innovation Strategy, Innovative Working Climate, and Financial Performance are presented in Table 3 along with a discriminate validity test. All three latent variables passed the discriminate validity test, which follows Fornell and Larcker (1981) approach, meaning that the constructs were clearly different from each other. Table 3 also includes the means and standard derivations of the observed items.

The structural model

The studied model exhibited a good fit (Table 4) with residuals that were normally distributed and centred on zero. Given the satisfactory fit of the model, the

Table 3. Descriptive statistics and correlation matrix for the constructs from the measurement model ($N = 241$).

			Correlation		DV	
Studied scales	Mean*	S.D.*	IS	WC	IS	WC
Innovation strategy (IS)	4.04	1.64	1			
Working climate (WC)	5.33	1.07	0.33	1	✓	
Financial performance	3.36	0.96	0.48	0.41	✓	✓

Note: All items were measured on a seven-point interval scale, ranging from one (strongly disagree) to seven (strongly agree); *Item statistics (mean of the observed items); DV(✓): Discriminant validity.

Table 4. Results from the structural equation model.

Model Fit	
SBχ^2	44.9
d.f.	40 $p = 0.27$
CFI	1.00
NNFI	0.99
SRMR	0.033
RMSEA	0.023 [0.000, 0.052]
Structural model	
Innovation Strategy -> Financial Performance	0.239**
Innovative Working Climate -> Financial Performance	0.168*
R^2 Financial performance	0.292

Note: *$p < 0.05$, **$p < 0.01$

hypotheses were evaluated by examining the robust estimated structural path coefficients (Table 4).

The findings presented in Table 4 suggested that Innovation Strategy (H7, $p < 0.01$) and Innovative Working Climate (H8, $p < 0.05$) had positive effects on financial performance, explaining 29% of Financial Performance.

Discussion and Implications

This thesis includes two conceptual models, and the proposed model performed as expected. The results support both of the hypotheses laid out earlier (i.e., innovative working climate and innovation strategy are both important to financial performance). This result is significant because relatively few studies have

addressed the relationship between innovation strategy, working climate, and financial performance. Therefore, the results of this study are an important contribution to this research area and to the validity of previous studies. This study further supports the results found in other studies focused on other sectors of industry. Therefore, we argue that businesses in general benefit substantially from creating an innovative working climate and developing innovation strategies. However, based on the scope of this study, we will emphasise the need to do so only within the framework of the Norwegian wood industry.

Innovation strategy and financial performance

Innovation strategy was found to be positively related to financial performance (H1; $\beta = 0.24$, $p < 0.01$). This finding validates previous findings that innovation strategy has a positive effect on innovation (Fruhling and Siau, 2007; Zahra and Das, 1993). Innovation also has an effect on financial performance, as Jenssen and Randøy (2006) found in the shipping industry. Another explanation, however, could be that an innovation strategy affects factors other than innovation that can also improve performance; this is a question for future studies to address.

This study contains important implications for firms. Specifically, the study proposes a theoretical framework that helps to understand one antecedent to financial performance: Innovation strategy. Furthermore, the study shows that firms that give high priority to research and development as well as that implement an innovation strategy can gain financially. Because these results were obtained using the wood industry in Norway, which has a long tradition of many small firms, this study shows that not only large, high-tech firms gain from focusing on innovation.

The managerial implications suggest that manufacturing firms from more traditional industries also need comprehensive innovation strategies. CEOs can meet this need by ensuring that the innovation strategy prioritises product, process, and business system innovation. Additionally, investment in an internal or external R&D department encourages innovation and financial performance to a certain degree.

Innovative working climate and financial performance

Innovative working climate was found to be positively related to financial performance (H8; $\beta = 0.17$, $p < 0.05$). This finding is consistent with earlier reports (Deshpandé and Farley, 1999a; Deshpandé *et al.*, 1993). Some studies have examined the link between innovative working climate and innovativeness (West and Farr, 1989), while others have used a mediator variable between innovative

working climate and innovativeness or financial performance (Crespell and Hansen, 2008, 2009). This study, however, examined the direct relationship between an innovative working climate and financial performance. This study supports the findings of all of the studies mentioned above, which indicated that financial performance is positively influenced by an innovative working climate. However, the relationship between an innovative working climate and financial performance might be more complicated than suggested here. The climate may increase innovation and affect financial performance positively, as described by Jenssen and Randøy (2006), or it may influence other organisational processes that influence performance. We suggest that future research should focus on this issue.

This study proposes a theoretical framework that helps to identify one precursor to improved financial performance: An innovative working climate. It presents a practical tool for managers who want to strengthen or develop a working climate for innovation to gain financially. For example, according to Amabile (1997), work environment and the creativity of the work force are significantly interrelated. An innovative working climate can help to create both committed and motivated employees and foster innovation Amabile *et al.* (1996b). West and Farr (1989) also claimed that individual innovation was likely to occur in the appropriate environment.

The conclusions drawn here can help managers to change or create strategies, procedures, and policies and also to determine what kind of coaching that management needs to create. In addition, management can improve important work climate dimensions like the ones investigated in this study (i.e., supervisory encouragement, team cohesion, and resources). These changes do not necessarily require large investments and so are helpful to firms in any financial position.

Encouragement from supervisors and the creation of strong team cohesion help to establish trust and openness in the firm. It is important for employees to feel safe in groups and at work so that they will not be reluctant to envision and share new ideas (West and Farr, 1989). Encouragement from supervisors also leads to more motivated employees (Amabile, 1997; Tidd and Bessant, 2009; West and Farr, 1989). To create this environment, firms might coach managers to be encouraging and supportive, enhance their people skills, prioritise development of strong teams, and give them a clear vision. Finally, this study supports earlier findings that employees must be given sufficient resources for innovative problem solving (Amabile *et al.*, 1996b; Crespell and Hansen, 2008; West and Farr, 1989).

Limitations

Like all research, this study has limitations. It is a cross-sectional study looking at a specific point in time. Without longitudinal data, conclusions regarding causality

cannot be drawn. However, this study is well-positioned in the literature, and similar studies have been conducted. More cross-industry and cross-national studies could further validate the findings presented here.

Firms that had gone out of business were not included in the sample. Therefore, the findings can only be generalised to surviving firms. This is an important limitation, especially because innovation and financial performance are discussed, and scholars differ on how these factors affect firms. Jenssen (2003) argued that the most likely outcome of innovation is failure. Therefore, inclusion of firms that had gone out of business in the study could have reduced the possibility of bias. However, although it would have been an interesting and important contribution to innovation research, it would have been very difficult to conduct such a study. Furthermore, the qualities of the innovative working climate were measured using the answers of managers. According to Patterson *et al.* (2004), some studies have shown that managers see their working climate as more innovative than do other employees.

This study targeted between 70% and 90% of the total firms (population) in this industry. Theoretically, this targeting could produce some bias. However, this bias should not be a large concern given the relatively high response rate, especially if this study is compared to other studies of the wood sector in other countries.

As discussed, only subjective measures were used to assess financial performance. Although subjective measures are a common way to measure financial performance and previous studies have shown strong links between subjective and objective measures of financial performance (i.e., Dess and Robinson Jr., 1984), this reliance is still considered to be a weakness of the present study. However, several studies have combined subjective and objective measures (e.g., Aragón-Correa *et al.*, 2007). While most researchers find a link between innovation and financial performance in firms that perceive themselves to be successful, Jenssen and Åsheim (2010) did not find this link when using objective measures. The use of additional measures of financial performance could therefore give this study more credibility.

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