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Summary

Managing innovation for sustainability- A dynamic capabilities approach

The overall aim of this research has been to provide deeper insights into how companies manage and develop innovation for sustainability. To better understand how companies manage and develop innovation for sustainability, insight should be provided into how companies develop and deploy the required resources and competencies for innovating towards sustainability. Adopting a dynamic capabilities approach, this research provides a dynamic perspective on how organizational and managerial capabilities act as antecedents to effectuate companies' resources and competencies for innovating towards sustainability. Dynamic capabilities are a set of strategic activities aimed at enabling companies to integrate, build, and reconfigure internal and external resources/competencies to address, and possibly shape, rapidly changing business environments. In an effort to addressing the aim of this research, both quantitative and qualitative research approaches have been used. The research consists of five studies that provide further insight into how companies manage and develop innovation for sustainability.

The first study (Chapter 2) reviews the findings of previous studies to make sense of companies' resources and competencies for innovating towards sustainability. Furthermore, the review analyses, discusses and synthesizes theoretical foundations of previous empirical studies to investigate and explicate the contribution of companies' resources and competencies for innovating towards sustainability. It also consolidates the companies' resources and competencies for innovating towards sustainability into three theoretically distinct capabilities; i.e., sensing, seizing, and reconfiguring, to describe the function and effectiveness of the companies' resources and competencies in managing innovation for sustainability.

In the second study (Chapter 3), the conceptual model of companies' organizational routines and capabilities for innovating towards sustainability has been tested by means of a quantitative approach. This study adopts the dynamic capabilities approach to argue theoretically and to investigate empirically what the specific organizational routines and capabilities are

that increase the degree of sustainability within firms' innovation activities. It is confirmed that companies with greater dynamic capabilities; i.e., sensing, seizing, and reconfiguring, are prone to innovate more towards a greater degree of sustainability. It is also found that companies' capabilities for sensing and seizing innovation opportunities for sustainability rely on the companies' reconfiguring capabilities. Put differently, reconfiguring capabilities enhance sensing capabilities of the firms for discovering the innovation opportunities for sustainability; as well as seizing capabilities for implementing and commercializing the opportunities for innovating towards sustainability. This study moves beyond the findings of the first study to explain which of the previously organizational routines seem to be the most important ones, based on empirical data from a representative survey on the innovation activities of German enterprises. This empirical study provides a more complete and holistic picture of important underlying routines of firms' capabilities for innovating towards sustainability.

The third study (Chapter 4), adopting a corporate perspective, investigates the organizational and managerial capabilities through which a company can coevolve resources and competencies around an innovation opportunity for sustainability. This study aims to contribute to a further theoretical and practical understanding of how capabilities are deployed by firms to create and implement system-level changes for innovating towards sustainability. According to this study, a firm's dynamic capabilities for sustainable innovation enable the company not only to invest in its own development for innovating towards sustainability but also invest in the development of the business ecosystem in which the company operates with others in the value chain. This study finds that proactive companies towards sustainability are more likely to identify and pursue innovation projects with sustainability advantages. It is also shown that having procedures to regularly get a better understanding of firms' environmental impacts helps companies to improve their sensing capabilities for recognizing the innovation opportunities for sustainability. The study indicates that companies need to bring together specialized resources and competencies scattered in diverse actors of the value chain around an innovation opportunity for sustainability; i.e., resource co-specialization. Thus, the companies engage in complementary partnerships in their innovative efforts for sustainability.

The fourth study (Chapter 5) argues that organizational routines cannot explain necessarily how innovations for sustainability are identified,

prioritized, and selected. Accordingly, having a mere understanding of the organizational routines is not enough for a successful management of innovation for sustainability. Therefore, this study intends to investigate how these capabilities develop, emerge or evolve within the companies to manage innovation for sustainability. This study shows that firms' dynamic capabilities for innovating towards sustainability include not only organizational routines but also individual and managerial entrepreneurial actions to leverage the required resources and competencies. The study finds that companies' dynamic capabilities for innovating towards sustainability have to be developed 'in-house' through a set of activities and cognitive processes focused on the organizations' routines.

The last study (Chapter 6) argues that innovation toward sustainability needs a socio-technical transition which not only entails new technologies but also changes in markets and governing institutions. Therefore, firms may engage in unique collaborations including collaboration with environmental NGOs as potential innovation partners for sustainability. This study explores how such a partnership arises and evolves, and observes in what way these dynamics influence the innovation process, with a particular emphasis on which contingencies contribute to its viability. The study shows that institutional dialogue activities and setting industry standards in collaboration with other actors of the value chain enable companies to support and govern the systematic development of the business ecosystem for innovating towards sustainability.

This research extends the literature on innovation for sustainability by focusing on how companies' managerial and organizational capabilities are built and strengthened for innovating towards sustainability. This research enables us to explain how these capabilities function throughout the development process of innovation for sustainability. Accordingly, this research has been useful in elaborating the nascent theory of dynamic capabilities in the field of innovation for sustainability. The research also provides insights for managers on how companies' resources and competencies should be, become and/or develop in order to integrate and enhance sustainability in their innovation activities. It also enables managers to understand the function and effectiveness of the companies' capabilities in managing innovation for sustainability.