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THE STRATEGIC CHALLENGE OF HUMAN-CENTERED INNOVATION IN PORTS



STUDIES INTO HOW STRATEGIC HUMAN RESOURCE PRACTICES CONTRIBUTE TO ENHANCING INNOVATION OUTCOMES IN ORGANIZATIONS AND REGIONS

RENÉE ROTMANS

The strategic challenge of human-centered innovation in ports:

Studies into how strategic human resource practices contribute to enhancing innovation outcomes in organizations and regions

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The strategic challenge of human-centered innovation in ports:
Studies into how strategic human resource practices contribute to enhancing innovation outcomes in organizations and regions

ACADEMISCH PROEFSCHRIFT

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aan de Universiteit van Amsterdam
op gezag van de Rector Magnificus
prof. dr. ir. K.I.J. Maex
ten overstaan van een door het College voor Promoties ingestelde commissie,
in het openbaar te verdedigen in de Agnietenkapel
op woensdag 14 oktober 2020, te 13.00 uur
door Renée **Rotmans**
geboren te Gouda

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	prof. dr. M. Bogers	University of Copenhagen

Faculteit Economie en Bedrijfskunde

“You cannot build an organization that is fit for the future, if it is not fit for human beings” (Hamel, 2007, p. 114).

Preface: my journey of being a PhD Candidate

My journey towards this dissertation already started in my childhood. My parents told me to follow my passion: to do something you like that is worth pursuing and to go a hundred percent for it. Without this support, I would probably not have dared to start a PhD trajectory. I knew beforehand that in order to follow your passion, you had to go through tough times. However, passion by itself is not enough. I found out that doing a PhD and finishing it, requires a great deal of discipline, endurance, and persistence as well. Although working on a PhD could be considered as a solitary endeavor, it is impossible without the support of others.

First and foremost, I am extremely thankful to my supervisors Prof. Dr. Henk Volberda and Dr. Rick Hollen from the Amsterdam Business School at the University of Amsterdam. Henk Volberda has been an infinite source of motivation, inspiration and wisdom throughout the PhD trajectory. Henk, you gave me confidence as an academic by helping me to frame my research in a new way when I thought this was not possible anymore and by asking critical questions that required me to explain and defend my decisions. You stimulated me to improve myself as an individual researcher by depicting my own ideas and you gave me valuable advice on several matters that were involved in academic research. I would like to thank you for all the effort and time you spent on my PhD trajectory. Rick Hollen has been another empowering supervisor who helped me in gaining valuable insights into numerous aspects of management science. Rick, you gave me the opportunity to develop new ideas and also critically assessed those ideas from a management perspective. The papers in this dissertation have undoubtedly benefited from your contributions.

This research was supported by the Port of Rotterdam Authority and Smartport. Doing research in a port setting was sometimes a challenge, but it also provided me with several opportunities to collect data that would have been more difficult to collect any other way. In particular, I would like to thank Henk de Bruijn, manager social and labor affairs at the Port of Rotterdam Authority, for guiding me through the process of conducting research in a port setting and being a role model in many other ways. Henk, you have introduced me to so many people and have coached me throughout this trajectory even in times when I thought that I could not do it any longer. Thank you for everything. Furthermore, I want to thank Astrid

Jonker, the HR manager of the Port of Rotterdam Authority for the continuous positive support, the acceptance of a PhD researcher in the HR team and the numerous talks we had about HR matters in the Rotterdam port region. Astrid, thank you for all your time and effort. You both made my research in the Rotterdam port region a great learning experience. In addition, I would like to thank Arjen, Mariette, Albert, Ludo, Berith, Anne, Nienke and all the other people working or having worked at the HR department of the Port of Rotterdam Authority. Thank you for all our good conversations, lunch meetings and endless laughs.

After two-and-half years of having worked at the Rotterdam School of Management (RSM), I moved along with my promotor Prof. Dr. Henk Volberda to the Amsterdam Business School (ABS). At first, I found it difficult to leave the Rotterdam School of Management and all the colleagues that I had been working with the last two-and-half years. Besides, I had to get used to traveling to Amsterdam a few times a week as I had just bought a house in a place called Berkel and Rodenrijs. Together with my dear colleagues Lance and Nazanin, who have become beloved friends, I started a new adventure at the Amsterdam business School. We were welcomed in a very warm and friendly atmosphere and I would especially like to thank Mark, Emma, Marta, Michiel and Josh for this.

I could not have finished the PhD without the support of my former roomies Lance, Emre and Nazanin who gave me feedback on my ideas, shared their knowledge, reflected on work-in-progress, were an audience to present for and supported me at several conferences. Lance, I want to thank you for buying cranberry juice for me in Minneapolis before my second presentation at SMS and for offering a listening ear in times when I needed it. Nazanin, many thanks for cheering me up at the office. I will never forget that I was the first colleague you told that you were pregnant. Thank you for all your kindness. Emre, I will never forget the good conversations we had about PhD (after)life and the many kilometers we have walked in Lisbon during the EURAM conference. You three became beloved friends and I am grateful for all the good times we had!

Taking the risk of choosing just a few names of many I want to show gratitude to, I would like to thank Ad Hoogsteder and Laurien Pooleij from ERBS for giving me several opportunities to observe my learning trajectory from a close distance. Kevin Heij from the Amsterdam Business School for your help with quantitative analysis and conceptual model

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Renée Rotmans

Rotterdam, February 2020

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Chapter 1.

1.1. General introduction

Worldwide social-, economic and environmental changes, such as the rise of new economic powers, climate change, increasing migration, exhaustion of natural resources, the transition towards renewable energy sources and (disruptive) technological innovations will transform the business landscape forever (Wang & Zatzick, 2019). To survive in the current rapidly changing environment, firms have to be smarter, more adaptive and more distinctive than competing firms in the business landscape (Beer et al., 2005). Innovation is largely recognized as a driver for macroeconomic progress, welfare and competitive advantage of firms (Tidd & Bessant, 2018).

The fundamental argument in the literature is that innovation plays a crucial role in the formation and development of firms in the form of improved or new services and products or the way a firm operates (Artz et al., 2010; Thornhill, 2006). Scholars have primarily focused on technological innovation, by understanding the effects of R&D investments on firm innovation success (e.g. Barge-Gil & López, 2014; Srivastava & Gnyawali, 2011). Firms that invest considerably in R&D are better able to identify new technological knowledge (Griffith et al., 2006; Cohen & Levinthal, 1990). Innovation is, therefore, predominantly considered as a "technology-based" concept (Cruz-Cázares et al., 2013; Barge-Gil & López, 2014).

Several management scholars (e.g. Teece, 2010; Khanagha et al., 2013; Volberda et al., 2013) have stated that only investing in technological innovations can increase the likelihood to achieve competitive advantage, but it does not assure innovation success. The trend over the last years has been towards exploring human-centered innovation (De Jong & Den Hartog, 2010; Birkinshaw et al., 2008; 2013; 2014; Dhondt et al., 2015; Volberda et al., 2007). This new age of innovation research reveals that the key to create unique firm value and to ensure a sustainable competitive advantage is also dependent on the human resources of firms (Hamel, 2006; Walker et al., 2010; Birkinshaw et al., 2008; Damanpour & Aravind, 2012).

With a human-centered innovation approach, firms can ensure that everyone is considered who will be directly and indirectly impacted by the new technology. Technological innovations such as drones, robotics and FinTech demand changes in processes and practices in organizations (Birkinshaw et al., 2008) and require investments in human-centered innovation such as strategic human resource (SHR) practices. It is, therefore, vital for firms to introduce

SHR practices (characterized as innovative work practices that are new-to-the-firm), which should be integrated into the corporate strategy of firms to make sure that HR and technology become embedded in the business operations (Wright et al., 2018). SHR practices can make a substantial contribution to the success of the firm (Delery & Roumpi, 2017). In the end, technological investments only lead to high innovation outcomes and productivity gains when SHR practices are introduced where people learn how to apply the new technology (Ortega-Argilés, 2009).

Firms will, therefore, need to redesign SHR practices in order to develop their human resources as a critical source of high innovation outcomes. The premise underlying SHR practices is that firms provide value through human resources that investments in technology alone cannot achieve (Rees & Smith, 2017; Pfeffer, 2005). Accordingly, SHR practices can be contributive to R&D activities because the practices stimulate the willingness and motivation of employees to participate in developing organizational knowledge (Scarbrough, 2003). For this reason, there is growing interest in uncovering how SHR practices can enhance innovation outcomes (e.g. Li et al., 2018; Gardner et al., 2012; Collins & Smith, 2006). However, the scientific evidence remains equivocal regarding the effects of SHR practices on innovation outcomes and their effects on the large institutional system (e.g. Gardner et al., 2012; Li et al., 2018; Collins & Smith, 2006). This lack of research leaves promising avenues for studies to understand how organizations can use SHR practices to create unique organizational and regional value.

In this dissertation, the introduction of SHR practices is further outlined in the context of the Rotterdam port region, Europe's largest industrial and port complex. By studying the role of SHR practices to enhance innovation outcomes in organizations and regions, this dissertation attempts to understand in what way organizations can obtain more value from employees and their skills, attitudes and behavior.

This dissertation contains three empirical studies (Chapters 2-4). Study I examines SHR practices, R&D investment and their complementary effects on innovation performance. Study II depicts two SHR practices, being strategic skill flexibility and employee empowerment, which are tested in relationship to organizational ambidexterity. Study III moves the focus away from the level of the individual or the organization to understand how and why one specific SHR practice being inter-organizational collaboration (defined as hybrid partnerships in this study), can create synergies between individuals, organizations and society overall to attain institutional change.

1.2. Theoretical background

1.2.1. Strategic human resource management

Humans are considered to be a valuable resource for firms and are reasoned to be a key determinant for a firm's success (Pfeffer, 2005; Castanias & Helfat, 2001). Scholars have depicted that human resources increase firm performance when human resources become the instrument to increase productivity (e.g. Noe et al., 2017; Samad, 2013). Scholars have emphasized that in order for human resources to become a strategic asset, human resources should be incorporated into the main strategy of the firm (Wright & McMahan, 2011; Harris et al., 2019). This school of thought resulted in strategic human resource management (SHRM), which broadens the perspective of HRM by recognizing the necessity for individuals to be aligned with firm goals (Carpenter et al., 2004).

According to the strategic human resource management literature (Wright & Boswell, 2002; Becker & Huselid, 2006; Armstrong & Baron, 2005), people and their "knowledge, skills and attitudes together with the competence to position these" (Chen & Huang, p. 105), can make an important contribution to the success of the firm. This contribution lies in the decision to perceive human resources and practices like employee wages, retention, training and development not in isolation but as assimilated through firm mechanisms such as firm goals (Wright et al., 2018; Delery & Roumpi, 2017).

Scholars emphasize that integration of human resource management in the business strategy of firms can alter the management of human resources, may increase firm performance and can add to the business success (e.g. Marchington, 2015; Guest, 2017; Delery & Roumpi, 2017; Wright & McMahan, 2011). The development of distinctive HRM systems that are difficult to be copied by others can help firms in attaining enhanced competitive advantage (Huselid et al., 1997; Barney et al., 2001). In order to attain competitiveness, HR departments should be future-oriented and HR strategies should function in line with the overall business plan (Harris et al., 2019). A future-oriented HR approach forces firms to constantly analyze HR developments, employee competencies needed, trends and recently advanced theoretical perspectives to remain competitive (Wright et al., 2018). However, strategic human resources by itself do not directly lead to increased competitive advantage (Guest, 2017). Management of the strategic human resources is required in order for individuals to align with firm goals and objectives (Delery & Roumpi, 2017; Guest, 2017; Jiang & Messersmith, 2018).

1.2.2. Strategic human resource (SHR) practices

Scholars have increasingly acknowledged the importance of SHR practices related to performance outcomes of firms (e.g. Mitchell et al., 2013; Chen & Huang, 2009; MacDuffie, 2005; Collins & Clark, 2003; Laursen & Foss, 2003). SHR practices are defined as "innovative work practices that are new-to-the-firm and through which human resources could be aligned with firm goals and policies" (Chen & Huang, 2009, p. 104). Fundamental to this conceptualization is the ability for people to make their own decisions concerning their job or the tasks they perform (Hill et al., 2008). Some studies have deliberated on the adoption process of SHR practices in firms (Tannenbaum & Dupuree-Bruno, 1994). Other studies have examined SHR practices related to firm performance or other organizational outcomes like efficiency, effectivity and productivity (Mitchell et al., 2013; MacDuffie, 2005; Ichniowski et al., 1997), product innovation (Beugelsdijk, 2008) and financial outcomes (Delery & Doty, 1996; Collins & Clark, 2003).

In the last decades, the notion of SHR practices has been utilized by academics in various research fields, such as organizational learning (e.g., Mitchell et al., 2013; MacDuffie, 2005; Ichniowski et al., 1997), strategic management (e.g., Collins & Clark, 2003; Delery & Doty, 1996), HRM (e.g., Chen & Huang, 2009; Laursen & Foss, 2003), and innovation management (e.g., Howaldt et al., 2016; Currie & Kerrin, 2003). Studies have examined different SHR practices such as compensation, training and development (Davies et al., 2001), HR planning, job design, pay system, recruitment and quality circle (Chand & Katou, 2007), skills and motivation (Collings et al., 2010), hiring and compensation (Currie & Kerrin; 2003), status barriers and training (MacDuffie, 2005), planned job rotation, performance-related pay and delegation of responsibility (Laursen & Foss; 2003), employee voice, compensation and broad internal deployment of employees (Delery & Doty, 1996). A selected overview of scholarly definitions of SHR practices that are used in the literature is presented in Table 1.1.

Table 1.1. Selected overview of scholarly definitions of SHR practices

Scholars	Definition of SHR practices
Laursen & Foss (2003, p. 244)	[…] "comprise a vision for working more effectively, efficiently and creating a more pleasant environment for the organization and its employees."
Moll & de Leede (2016, p. 97)	[…] "are introduced to stimulate new ways of working, which is regarded as time, place and independent work."
Mitchell et al., (2013, p. 902)	[…] "are ways to make employees work more efficiently and effectively. Employees are offered more self-control, freedom and collaborative efforts."
Blok et al. (2012, p. 2606)	[…] "are the changes in the workplace that take place in four aspects 1) the physical workspace, 2) technology, 3) organization and management, and 4) in the work culture."
Sparrow (1998, p. 83)	[…] "is a means of achieving organizational flexibility by experiencing with structural flexibility (decentralization), numerical flexibility (temporary employment) and job-based flexibility (greater control)."

A new perspective on SHR practices and work has appeared, where "stability, bureaucracy, order and control are replaced for agility, flexibility and instability" (Way et al., 2018, p. 571). At this point in time, enduring the HR process routinely the way it has been done for years does not work any longer. Nor does the conventional approach of lifetime employment, where employees enter the firm after graduation and work in the same firm until their retirement (Harris et al., 2019). Employees increasingly aim to choose their own career path, change positions more often and get into 'job-hopping' between different firms (Howaldt et al., 2016).

1.3. Overall research objective and research question

Despite the substantial interest of SHR practices within firms and the plethora of research in this area (e.g. Chen & Huang, 2009; Collins & Clark, 2003; Jiang et al., 2017; Howaldt et al., 2016; Mitchell et al., 2013; Beugelsdijk, 2008; Laursen & Foss, 2003), scholars and managers are left behind with ambiguous findings. For instance, it is unclear how the practices contribute to exploratory and exploitative innovation outcomes and might result in organizational

ambidexterity. Besides, it is unclear how SHR practices are related to the broader institutional system and how they might contribute to achieving societal outcomes such as institutional change.

The scarcity of empirical studies leaves a dearth of insights into how individuals and organizations can utilize SHR practices in a way to create unique organizational and regional value. Consequently, this lack of understanding requires further clarification of the possible benefits of SHR practices. By this means, this dissertation hopes to provide an expanded focus on the value of employees to enhance innovation outcomes in organizations and regions. Subsequently, the aim of this dissertation is:

> *To unravel the importance of SHR practices by increasing our understanding of how, and under which conditions, SHR practices contribute to enhancing innovation outcomes in organizations and regions.*

This dissertation seeks to address this aim by (a) using and incorporating various theoretical perspectives, (b) applying a mixed-methods approach by using both qualitative and quantitative methods to complement each other, and (c) conducting empirical research with a wide range of levels of analysis (micro-, organizational-, field- and societal-levels).

A spectrum of initiatives in the field of human resources i.e. the introduction of novel SHR processes, practices and structures in and between organizations, is being investigated in a regional context. Therefore, this dissertation covers the following overall research question:

How can strategic human resource (SHR) practices contribute to enhancing innovation outcomes in organizations and regions?

1.4. Subthemes

The research question of this dissertation and the related topic (strategic human resource practices) can be addressed in multiple ways and covers several subthemes (see Table 1.2). An important subtheme is *strategic skill flexibility,* which is "an individual trait or characteristic of potential alternative uses to which skills can be applied and redeployed quickly" (Wright & Snell, 1998, p. 761). Flexibility in skills includes the willingness and ability to respond to changing circumstances and expectations readily (Shalley et al., 2004). Drawing on prior

research, scholars have argued that employees who approach their job with a flexible mindset are typically more productive (Martínez-Sánchez et al., 2011; Morgeson et al., 2005). Besides, *employee empowerment* that is "the freedom and authority given to employees to perform and control their tasks to the best of their abilities" (Bowen & Lawler, 1992, p. 33) is a second subtheme. By giving employees autonomy, firms enable them to become more entrepreneurial and creative and to experiment with elements, processes and structures (Levin & Sanger, 1994). Both strategic skill flexibility and employee empowerment are considered to be important SHR practices to serve existing and new customers and markets (Lengnick-Hall et al., 2011).

Another important subtheme *R&D investment*, which is generally identified with technological innovation (Crossan & Apaydin, 2010; Barge-Gil & López, 2014). R&D investment is known as novel technological knowledge that can make incremental improvements or radical changes to products, services, business models or processes within firms (e.g. Cruz-Cázares et al., 2013; Baden-Fuller & Haefiger, 2013). Recent developments such as drones, robotics and FinTech are strongly technologically determined and require R&D investment. At the same time, however, these developments request changes in processes and practices within firms (Birkinshaw et al., 2008) and require investments in human-centered innovation such as SHR practices. For this reason, R&D investment and its relation to SHR practices is an important subtheme of this research.

A fourth important subtheme is *organizational ambidexterity*, which denotes the capability to reconcile exploratory and exploitative innovation simultaneously in organizations (Birkinshaw & Gupta, 2013; Junni et al., 2013; Simsek, 2009). Exploitative innovation refers to adhering to current organizational needs by using existing competences and know-how. It is about increasing efficiency within organizations and implies "aspects apprehended by words such as production, implementation, refinement, selection, and execution" (March, 1991, p. 71). Exploratory innovation refers to discovering new organizational needs by using new know-how and competences. It implies "aspects like risk-taking, flexibility, search, discovery and experimentation" (March, 1991, p. 71).

Table 1.2. The subthemes of this dissertation

1. **Strategic skill flexibility:** Having a broad spectrum of skills enables employees to anticipate and quickly respond to changes by finding new combinations of knowledge and adapting current configurations to provide different product and service variations (Martínez-Sánchez et al., 2011; Shalley et al., 2004).
2. **Employee empowerment:** Being intrinsically motivated, stemming from an employee's sense of self-determination, meaning and competence, can help organizations in finding new and favorable combinations of knowledge that may be utilized to create value (Staw & Boettger, 1990; Kang et al., 2012; Zhou et al., 2013).
3. **R&D investment:** Input such as technological knowledge or raw materials to achieve 'new' output (Cruz-Cárez et al., 2013; Crossan & Apaydin, 2010), is considered to be a key indicator for firm innovation performance (Evangelista & Vezani, 2010; Teece, 2010). Besides, new technological knowledge requires investments in human-centered innovation such as SHR practices
4. **Organizational ambidexterity:** "The simultaneous pursuit and combination of exploitative and exploratory innovation efforts within organizations" (Jansen et al., 2009, p. 799) is important for organizational survival (Patel et al., 2013; Junni et al., 2015; O'Reilly & Tushman, 2013). Engaging in ambidexterity allows the firm's experimental activities to be protected from the inertia that may exist in the firm's mainstream activities (Benner & Tushman, 2003).
5. **Hybrid partnerships:** Organizations in the public and private sectors are increasingly engaging in cross-sector collaborations (Smith & Besharov, 2019; George et al., 2016) to tackle society's most complex and 'wicked problems' (Klitsie et al., 2018, p. 403). Multi-actor collaboration is often required as these problems are generally considered too big for one organization or a sector to carry out (Koschmann et al., 2012).
6. **Institutional change:** Purposeful actors leverage divergent institutional logics to spearhead change within society (Garud et al., 2002). Attempts to alter or replace institutional logics are referred to as acts of institutional entrepreneurship, which aim to create institutional change (Battilana et al., 2009; Maguire et al., 2004).

Another important theme in this dissertation is a SHR practice entitled inter-organizational collaboration, i.e. hybrid partnerships. Hybrid partnerships are inter-organizational collaborations of multiple intertwined, but independent organizations that utilize each other's output as outset to establish something that is unachievable by one organization alone (Smith & Besharov, 2019; George et al., 2016; Koschmann et al., 2012). One important motivation is that hybrid partnerships incorporate different institutional logics and most often try to enhance *institutional change* (Greenwood et al., 2011; Battilana & Dorado, 2010; Lounsbury, 2007), being the dissertation's sixth subtheme. The analysis of institutional change concentrates on

the degree to which hybrid partnerships can produce new policies that are dispersed beyond the boundaries of the collaboration.

Table 1.3. shows that every subtheme mentioned above is covered within at least one study of the dissertation.

Table 1.3. Subthemes covered in the dissertation

	Study I (Chapter 2)	Study II (Chapter 3)	Study III (Chapter 4)	Discussion (Chapter 5)
1. R&D investment	X	X		X
2. Strategic skill flexibility	X	X	X	X
3. Employee empowerment	X	X	X	X
4. Organizational ambidexterity		X		X
5. Hybrid partnerships			X	X
6. Institutional change			X	X

1.5. Research design

Quantitative and qualitative methods are used in this dissertation to shed light on the research question. The first study seeks to get a deep understanding of the SHR practices used by organizations in order to respond to new technological innovations. A longitudinal multiple-case study is conducted to do in-depth research in several organizations in the Rotterdam port region. Interview data on SHR practices is complemented with archival data on R&D investment and innovation performance measures.

The insights from the first study provide input for the development of a number of hypotheses in the second study, which are then tested using a large-scale survey. In the second study, two SHR practices – strategic skill flexibility and employee empowerment – are tested in relationship to achieving organizational ambidexterity. This study makes use of existing scales from the literature in order to test the key variables. The hypotheses in the second study are tested using hierarchical regression analysis. The large-scale survey that is used, is part of a larger innovation research project called the *Port Competition and Innovation Barometer*. The barometer quantifies several types of human resource progress and innovation in the

Rotterdam port region. This barometer has been established by the former Erasmus Center for Business Innovation (ECBI), which is now called the Amsterdam Center for Business Innovation (ACBI), under the supervision of Prof. Dr. Henk Volberda. The purpose of the survey is "to better understand the role of innovation in the Rotterdam port region and to uncover the influence of innovation on competitiveness" (Volberda et al., 2013, p. 2).

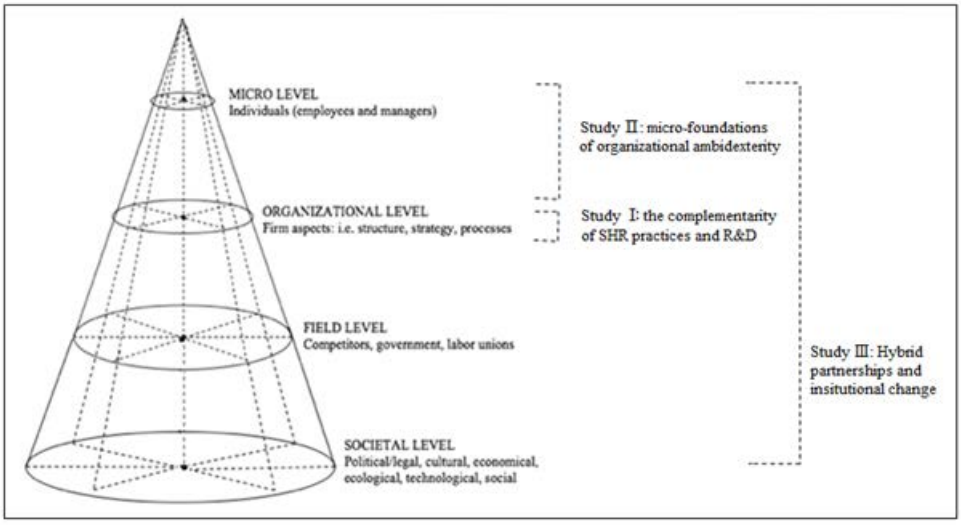
In study three, a thorough exploratory study of two cases is performed to unearth the opinions, thoughts and feelings of the respondents and to find out more about the underlying mechanisms of the quantitative results. This study focuses on one specific SHR practice being hybrid partnerships in the broader institutional context. In particular, the study looks at how hybrid partnerships can attain institutional change in the regional context. Data is collected through interviews, observations and archival data.

In order to make the findings more profound and to ensure richness of detail and empirical research, both qualitative and quantitative methods are used in this dissertation. Doing so provides a holistic view of the sources and outcomes of the key variables that are used in this dissertation. Additional information about the methods and analyses used in this dissertation can be found in each separate study.

1.6. Levels of analysis

In this dissertation, the focus will be on a variety of individual, organizational, and societal factors that can influence the tendency for a firm to introduce and use SHR practices. This dissertation, therefore, does not focus on one specific level of analysis, but instead examines a broader range of levels (individual-, organizational-, field- and societal-level). Study I focuses on the organizational-level of analysis by exploring which SHR practices are used in organizations and how they can be complementary to R&D investments in order to achieve high innovation performance. Study II focuses both on the micro-level and organizational-level by looking at how micro-level activities can achieve organizational-level outcomes. Study III takes a multi-level approach by focusing on micro-, field- and societal-level aspects of hybrid partnerships in attaining institutional change. The pyramid in Figure 1.1. shows the different levels of analysis that are used in the three studies included in this dissertation.

Figure 1.1. Different levels of analysis used in the three studies



1.7. The research context: the Rotterdam port region

This research is executed in the Rotterdam port region, which is Europe's largest port and industrial complex (Port of Rotterdam Authority, 2019). As a facilitator for import and export, ports create a significant economic activity for the local and regional economies (Ferrari et al., 2010). Ports also provide essential support for commercial activities in the hinterland, because ports are able to make a crucial connection between land and sea transport. The Rotterdam port region is an important European entry gate for trade and a hotspot for energy, industry, innovation and digitalization. The added value of the Rotterdam port region is calculated at 45.6 billion euros, which is 6.2% of the Dutch GDP (Port of Rotterdam Authority, 2019). This added value includes indirect effects, which are all the economic activities in The Netherlands that could have been achieved with the involvement and participation of the port of Rotterdam. Examples are agriculture, retail and logistics.

It is remarkably interesting to study the Rotterdam port region owing to the diversity of clusters and business activities and due to its unique and important strategic contribution to "the economic progress of firms in the region" (Van den Bosch et al., 2011, p. 26). Ports cannot merely be considered as the main element of the transportation sector, but are the means of incorporation and enlargement in the world economic system (Dwarakish, & Salim, 2015). Moreover, ports can be considered as knowledge-hubs, where several individuals of firms

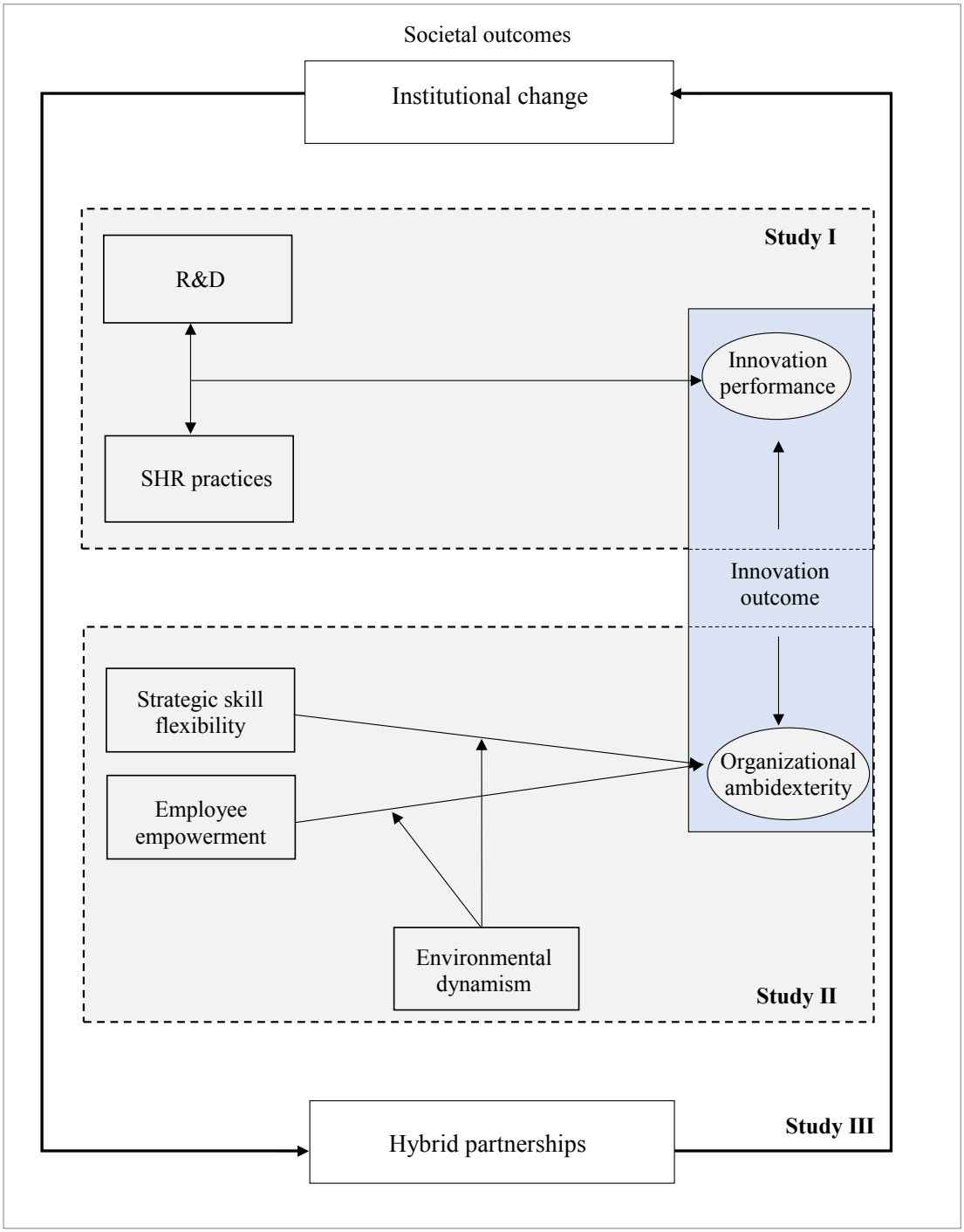
operating in different sectors, share knowledge, collaborate and create ideas. The knowledge that resides within the employees of firms in ports is, among other things, important to increase the international sustainable competitiveness of port and industrial complexes.

Studies done in ports (i.e. Hollen et al., 2015; Ducruet et al., 2009; Carbone & Martiono, 2003) have mainly focused on the competitiveness of port-firms, local systems and regions, "while innovation-related issues have substantially remained unexplored" (Martiono et al., 2013). Due to a lack of innovation-related issues in the port context, Acciaro et al. (2014) studied innovation related to environmental sustainability in ports and argued that future research "should identify best practices for successful innovation in a port context". The strong dependence among port firms towards the regional-, national- and world economic system (Van den Bosch et al., 2011), makes it an unique and important research context.

1.8. Outline of the dissertation

This dissertation includes two qualitative studies (Chapters 2 and 4) and one quantitative study (Chapter 3) that are individual studies, which each independently contribute to the overall research objective and deliver an answer to the overall research question of this dissertation. The three studies are shortly explained in this preliminary chapter 1 and in the concluding chapter 5. Each chapter that is included in this dissertation contains at least two of the aforementioned subthemes that have been explained in Table 1.2. and each chapter can be read independently from each other. A representation of the overall conceptual model of this dissertation is presented in Figure 1.2.

Figure 1.2. Conceptual model of the dissertation



Summary study I (see chapter 2): It takes two to tango: the complementary effect of SHR practices and R&D on firm innovation performance

This study examines the complementarity effects of SHR practices and R&D on firm innovation performance. While various scholars have studied SHR practices or R&D investment separately in relation to innovation performance, there is a lack of research on its complementarity effects. This study tries to gain an improved understanding of the complementarity effects by performing a multiple-case study in a cross-sectoral setting. Data was gathered from 68 semi-structured interviews and secondary data sources of 42 geographically proximate firms and other informants in The Netherlands.
Based on the empirical analysis, the study finds that SHR practices and R&D investments tend to cluster together to form different organizational configurations. These configurations differ in the extent to which firms invest equally in R&D and in four SHR practices, which are flexible working roles, training and development, employee wellbeing and co-working. The innovation performance is highest for firms (game-changing firms) that invest relatively heavily in SHR practices and in R&D. The performance is lower for firms that invest moderately in SHR practices and R&D (reforming firms) and lowest for firms that invest little in both (conventional firms). The findings also suggest that firms with a dominant focus on either R&D or SHR practices, are likely to experience suboptimal returns regarding innovation performance outcomes. These findings increase our understanding of how complementary investments in SHR practices and R&D may explain differences in innovation outcomes.

Summary study II (see chapter 3): The micro-foundations of organizational ambidexterity: strategic skill flexibility and employee empowerment

This study gives valuable insights into micro-foundations of organizational ambidexterity. A growing number of studies have focused on individuals and their behaviors and beliefs as primary performance drivers of exploratory and exploitative innovation outcomes. However, how firms deal with the integral dilemmas of exploratory and exploitative innovation efforts is still underexplored. Particularly, there is a lack of studies on the micro-foundations of organizational ambidexterity. The dearth of studies with regard to this relationship is surprising, specifically since simultaneously exploring and exploiting seems to be originated from the cognitive and creative capabilities of individuals. The study outlines how firms balance exploration and exploitation through the introduction of SHR practices that concentrate on (re)creating jobs around a functional flexible employee.

The study hypothesizes that strategic skill flexibility and employee empowerment serve as micro-level antecedents of organizational ambidexterity. The hypotheses are tested using survey data from 261 firms operating in the Port of Rotterdam, which is one of Europe's largest port-industrial regions. The findings reveal that both strategic skill flexibility and employee empowerment act as important micro-foundations of organizational ambidexterity. Specifically, the study finds that environmental dynamism positively moderates the relationship between strategic skill flexibility and organizational ambidexterity. However, the study did not find enough evidence to conclude that environmental dynamism also positively affects the relationship between employee empowerment and organizational ambidexterity. The complex and dynamic interplay of strategic skill flexibility and employee empowerment nurtures organizational ambidexterity and enables firms to sustain innovativeness in dynamic environments. By looking at the micro-foundations of organizational ambidexterity, the study opens up several research opportunities to study how firms can achieve ambidexterity through certain micro-level activities.

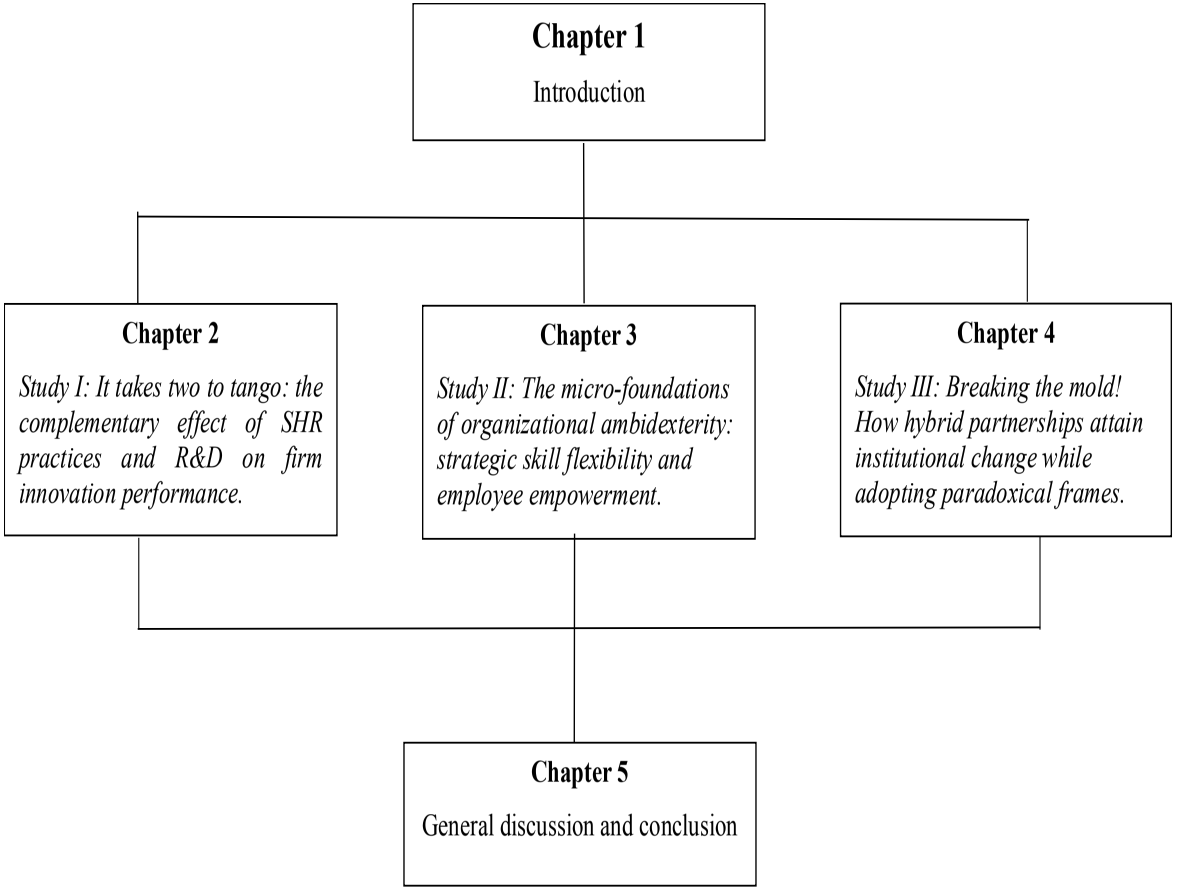
Summary study III (see chapter 4): Breaking the mold! How hybrid partnerships attain institutional change while adopting paradoxical frames

Hybrid partnerships that engage in both social and commercial objectives face the specific challenge of mobilizing both social activists and commercial actors, who adhere to competing logics, simultaneously. Yet, the question of how hybrid partnerships combine seemingly incompatible logics to attain institutional change has remained understudied. In a three-year case study of two hybrid partnerships in the Rotterdam port region, this study examines the different symbolic and substantive actions performed by members of hybrid partnerships in a process model across micro-, field-, and societal-levels over time. The actions performed across these different levels of analysis are interlinked and eventually result in institutional change in HR policies at the societal-level. This study demonstrates that embracing the tensions around logic incompatibility enables hybrid partnerships to attain two different interrelated states of institutional change: emergent and planned institutional change. This paradoxical perception can create struggles and conflicts within people and could, therefore, increase their capability to deal with contradictions. This can enhance the likelihood of planned institutional change. By studying this field of inquiry, the study makes some important theoretical contributions to the literature on inter-organizational collaboration and logic incompatibility.

Table 1.4. Overview of the three studies included in the dissertation

Study	I	II	III
Research question:	What is the complementary effect of SHR practices and R&D investments on firm innovation performance?	How do firms realize organizational ambidexterity in a dynamic environment through micro-level activities in terms of strategic skill flexibility and employee empowerment?	How can actors in hybrid partnerships that have to deal with divergent institutional logics attain institutional change?
Research gap:	Despite the theoretical appeal in the management literature that is attained to both SHR practices and R&D within organizations, there are only a few studies that aim to unravel their complementary effect on firm innovation performance. This remains an ambiguous and under researched perspective in the existing literature on SHR practices and R&D.	Organizational ambidexterity has received growing interest in the innovation and strategy literature over the past decade. Yet, the activities located at the individual-level i.e. micro-foundations that affect organizational ambidexterity are relatively underexplored. A more detailed understanding of individual activities may help to uncover how firms cope with the inherent dilemmas of exploratory and exploitative innovation.	Few studies examine how hybrid partnerships that incorporate seemingly incompatible logics can attain institutional change. For instance, little is known about how partners' interactions govern institutional change. Even less is known about what pushes members to change the partnership through time and what consequences that can have on the institutional environment.
Research method:	Qualitative study	Quantitative study	Qualitative study
Dependent variable:	Firm innovation performance	Organizational ambidexterity	Institutional entrepreneurship
Independent variable(s):	• SHR practices (flexible working roles, employee wellbeing, training and development, intra- and inter-firm co-working) • R&D investments	• Strategic skill flexibility • Employee empowerment	• Hybrid partnerships
Moderating variable:	-	Environmental dynamism	-
Level of analysis:	Organizational-level	Micro-level and organizational-level.	Micro-, field- and societal-level (multi-level)
Data collection:	Exploratory multiple-case study	Cross-industry survey	Exploratory multiple-case study
Sample size:	42 cases (organizations)	N= 261 (organizations)	2 cases (hybrid-partnerships)
Study period:	2016-2018	2016-2018	2016-2019
Main findings:	The results indicate that what is eventually important for a firm's high innovation performance is its ability to invest strongly in a combination of four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and high levels of R&D-investments such that synergies between the two are maximized. As such, the benefits are greatest for game-changing firms that invest relatively heavily in both SHR practices and R&D.	The findings reveal that both strategic skill flexibility and employee empowerment are considered to be important micro-foundational sources of organizational ambidexterity. This perspective creates new research opportunities concerning the role of micro-foundations in achieving organizational ambidexterity.	The results show that if hybrid partnerships can interpret divergent social and commercial objectives as paradoxical – that is, as contradictory but interrelated rather than as incompatible – that is, impossible to reconcile, the hybrid partnerships are able to attain planned institutional change. In this way, this study shows that members of hybrid partnerships should adopt paradoxical mindsets to attain the desired planned institutional change over time.

Figure 1.3. Outline of the dissertation



1.9. Declaration of contribution

I confirm my involvement in this dissertation and I also declare the involvement of other persons and organizations that were important for the realization of this dissertation.

This dissertation was supported and co-financed for two-third by the Port of Rotterdam Authority and for one-third by SmartPort. The supervisory team of this dissertation consisted of Prof. Dr. Henk Volberda and Dr. Rick Hollen. Henk de Bruijn, manager of social labor affairs at the Port of Rotterdam Authority, was my practical mentor and inspirator. Moreover, Astrid Jonker, HR manager at the Port of Rotterdam Authority connected me to several HR managers, experts, professionals and recruiters in the Rotterdam port region. Cees Alderliesten (Deltalinqs), Maarten van Kooij (Municipality of Rotterdam), Michiel Jak (former Managing Director Smartport), Elisabeth van Opstall (current Managing Director Smartport) and Dirk Koppenol (Portfolio Manager Smartport) supported the author by providing access to numerous sources of data.

The survey instrument used in this dissertation was developed by the former Erasmus Center for Business Innovation (ECBI), which is now called the Amsterdam Center for Business Innovation (ACBI). The research center consists of several researchers under the supervision of Prof. Dr. Henk Volberda, Dr. Rick Hollen and Dr. Kevin Heij.

Chapter 1: The author of this dissertation worked individually on this chapter. The supervisors Prof. Dr. Henk Volberda and Dr. Rick Hollen assisted by giving continuous and constructive feedback.

Chapter 2: The gathering of data on the complementarity between SHR practices and R&D was done individually by the author of this dissertation. Henk de Bruijn had several connections with firms in the Rotterdam port region, which was useful to gather all the qualitative data. The author of this dissertation wrote the study presented in chapter 2 with the help of Prof. Dr. Henk Volberda and Dr. Rick Hollen.

Chapter 3: The gathering of the survey data was done with the help of the research team of ECBI at the Erasmus University in Rotterdam. The other aspects of the chapter such as defining a research question, theoretical review, data analysis and the writing was done by the author of this dissertation.

Chapter 4: This chapter involved collaboration with initiatives set up by two actors working at the Port of Rotterdam Authority, which are called RISI and RWORKS. The gathering of the data was done by the author of this dissertation and took over three years. The gathering of the data involved in-depth exploration and attendance of several meetings at RISI

and RWORKS. Special thanks go to Astrid Jonker, who introduced the author of this dissertation to both of the partnerships.

Chapter 5: The author of this dissertation wrote the chapter under the supervision of Prof. Dr. Henk Volberda and Dr. Rick Hollen.

Chapter 2.

Study I: It takes two to tango: the complementarity effect of SHR practices and R&D on firm innovation performance

Abstract. Both strategic human resource (SHR) practices and R&D are acknowledged to be important for enhancing innovation-driven business performance. The complementarity effect of SHR practices and R&D on innovation outcomes, however, remains largely unexplored. This study addresses this gap in the literature using an exploratory multiple case study approach. The data was collected from sixty-eight semi-structured interviews and secondary data sources of forty-two geographically proximate firms and other informants in the Port of Rotterdam, Europe's largest port and industrial region. Based on our empirical analysis, we find that SHR practices and R&D investments tend to be clustered together to form different organizational configurations. These configurations differ in the extent to which firms invest equally in R&D and in four SHR practices, namely flexible working roles, training and development, employee wellbeing and co-working. Firms that invest relatively heavily in SHR practices and in R&D show the highest innovation performance (game-changing firms). Innovation performance is lower for firms that invest moderately in SHR practices and R&D (reforming firms) and lowest of all for firms that invest little in either (conventional firms). We also find that firms that have a dominant focus on either SHR practices or R&D can encounter suboptimal innovation performance outcomes compared to firms that concentrate on SHR practices and R&D simultaneously. This study adds to insights into how complementary investments in SHR practices and R&D may explain differences in innovation outcomes.

Keywords: complementarity, configurations, innovation performance, SHR practices and R&D

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* Authors of the paper: Rotmans, R., Hollen, M. A., Volberda, H. W.
The paper is submitted to a peer-reviewed academic journal and is currently under review. Earlier versions of the paper were presented at several conferences such as the European Academy of Management (EURAM) in Reykjavik 2018, the Strategic Management Society (SMS) in Paris 2018, the European Group for Organization Studies (EGOS) in Tallinn 2018, the International Association of Maritime Economists in Athens 2019 and the Transport Research Society World Conference in Antwerp 2017.

2.1. Introduction to study I

Innovation is generally recognized as being critical for firms to create value and to prosper in the long run (Wang & Zatzick, 2019). While scholars have focused primarily on the role of R&D in enhancing firm innovation success (Srivastava & Gnyawali, 2011; Sampson, 2007; Barge-Gil & López, 2014), there is growing interest in understanding how strategic human resource (SHR) practices can enhance innovation performance (e.g. Li et al., 2018; Gardner et al., 2012; Collins & Smith, 2006). SHR practices are defined as "new-to-the-firm innovative work practices through which human resources could be aligned with firm goals and policies" (Chen & Huang, 2009, p. 104). The underlying premise of SHR practices is that they enable firms to provide value that cannot be achieved by investing in R&D alone (Rees & Smith, 2017; Pfeffer, 2005). Accordingly, SHR practices can be conducive to R&D activities, because they make employees more willing and more eager to help in developing organizational expertise (Scarbrough, 2003).

Despite the importance of both SHR practices and R&D within firms, there are only a few studies that have sought to unravel their complementarity effect on firm innovation performance (Woudstra et al., 2017; Peter & Robert, 2015; Ennen & Richter, 2010). Instead, several studies have focused on substitution effects, i.e., the ways in which technology can substitute for human resources. In doing so, complementarity effects are often ignored. Complementarity effects revolve around the basic principle that "doing more of one thing increases the returns of doing more of the other" (Milgrom & Roberts, 1995, p. 181). When resources are analyzed together, it has been found that the individual effects on innovation performance are depleted by the "full system effects" (Whittington et al., 1999, p. 585). One possible reason for the lack of research on the complementarity effect with respect to SHR practices and R&D is the complexity of the innovation and human resource concepts (Peter & Robert, 2015). A different reason could be the separation between studies on R&D and studies on SHR practices (Ennen & Richter, 2010; De Leede & Looise, 2005). For this reason, the complementarity notion remains an ambiguous and under researched field within the literature on SHR practices and R&D (Peter & Robert, 2015).

In this paper, the following research question is addressed: What is the complementarity effect of SHR practices and R&D investments on firm innovation performance? To address this question, we performed an exploratory multiple-case study in the Port of Rotterdam, Europe's largest port and industrial complex. The results of this study show that the firms could be divided into three main organizational configurations, which we labeled *conventional* (little

investment in R&D and SHR practices), *reforming* (moderate investment in R&D and SHR practices) and *game-changing* (substantial investment in R&D and SHR practices). Our results indicate that what matters eventually for a firm to excel at innovation performance is its ability to invest heavily in a combination of four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and also in R&D so that synergies between the two can be maximized. As such, the benefits are greatest for game-changing firms that invest heavily in both SHR practices and R&D.

The contributions of this paper are twofold. First, we make a theoretical contribution by combining both the human and technological perspectives in the innovation literature. By doing so, we bridge prior research that addresses the impact of SHR practices on innovation outcomes (e.g. Chen & Huang, 2009; Laursen & Foss, 2003) and the effect of R&D on innovation performance (e.g. Barge-Gil & López, 2014; Sampson, 2007). More specifically, we add to research on complementarities (Antonioli et al., 2013; Ballot et al., 2015; Cozzarin & Percival, 2006; Percival & Cozzarin, 2008; Milgrom & Robters, 1995; Whittington et al., 1999; Volberda & Elfring, 2001) by showing how complementarity between substantial investment in SHR practices and R&D can be most beneficial for firms. Second, we make an empirical contribution by adding to qualitative work in the field of complementarities (Peter & Robert, 2015; Madsen & Ulhøi, 2005) and to research on the configurational approach (e.g. Miller, 2018; Delmas & Pekovic, 2018). More specifically, we provide new empirical insights concerning the importance of using both human and technological resources within firms and we address the dearth of qualitative studies in this research field (Olson et al., 2018; Delmas & Pekovic, 2018).

In the remainder of this paper, we will deliberate on the relevant literature of R&D, SHR practices and the complementarities between them to guide us in our qualitative research. After the literature review, the methods section and the findings, we consider the theoretical and managerial implications of our study and give recommendations for future research.

2.2. Theoretical background

2.2.1. Technological innovation versus the human side of innovation

Scholars in the field of innovation have concentrated primarily on technological innovation, which is generally about the implementation of technical knowledge that can make incremental improvements or radical changes to products, services, business models or processes within

firms (e.g. Cruz-Cázares et al., 2013; Baden-Fuller & Haefiger, 2013). Technological innovation is generally related to an investment in R&D (Crossan & Apaydin, 2010; Sampson, 2007; Srivastava & Gnyawali, 2011; Barge-Gil & López, 2014). R&D can serve as an input such as knowledge or raw materials to attain a 'new' output, which might be a product or service innovation, for instance (Cruz-Cázares et al., 2013; Barge-Gil & López, 2014; Crossan & Apaydin, 2010). Firms that invest substantially in R&D are better capable of identifying novel technological knowledge (Griffith et al., 2006) and are able to utilize the outcomes of earlier R&D investments to improve new knowledge (Zahra & George, 2002).

R&D is considered to be a key indicator for firm innovation performance (Evangelista & Vezzani, 2010; Teece, 2010). However, simply increasing the firm's level of R&D is not sufficient, and may even reduce its possibility of success (Teece, 2010; Sirmon et al., 2011). The firm may become stuck in a 'failure trap' (Heij, 2015, p. 62), as it becomes more and more difficult to exploit and gain advantage of its present knowledge (Levinthal & March, 1993). Innovation research that has focused on the superior impact of technologies and products grounded in the process of creative destruction can be expanded to include research on organizational and management innovations designed to achieve certain desired organizational outcomes (Hamel, 2006; Mol & Birkinshaw, 2009; Teece, 2010; Birkinshaw et al., 2008). Research on these non-technological innovations, which relate to human resources, is relatively scarce (Damanpour, 2014), even though the initiation and growth of technological innovation is strongly affected by the creative features of employees in firms (Schiuma, 2017).

The innovation success of firms is to a large extent dependent on the efforts, behaviors and interactions of its employees (Gardner et al., 2012). Employees have the ability to create new ideas, develop new ways of thinking and search for new opportunities (Wright et al., 2001; Scarbrough, 2003). The development and creation of new knowledge can create great unpredictability and requires creative people, who are curious, not afraid of uncertainty, open-minded and dare to take risks (Madsen & Ulhøi, 2005). The attitudes, capabilities and behaviors of employees are therefore considered to be crucial for the advancement of innovation activities (Hipp & Grupp, 2005).

As means of motivating employees to become involved in innovation activities such as creative thinking (Damanpour, 2014; Chen & Huang, 2009), firms may use strategic human resource (SHR) practices (Laursen & Foss, 2003; Chen & Huang, 2009) to develop organizational expertise in creating new services and products that are in line with business goals and strategies (Jimenez & Sanz-Valle, 2008). SHR practices are "innovative work practices that are new-to-the-firm and which are aligned with business goals" (Chen & Huang,

2009, p. 104). In order for the firm's employees to become a strategic asset, SHR practices should be incorporated into the fundamental strategy of the firm (Wright et al., 2001). SHR practices are able to impact and change the capabilities and behaviors of employees to realize an improved organizational outcome such as better innovation performance (Collins & Clark, 2003). It is therefore important for firms to implement SHR practices, as this might influence employees to come up with a greater diversity of ideas and to adopt more innovative behaviors (Cheng & Huang, 2009).

SHR practices seek to enhance employees' competencies, learning and creative thinking (Jackson et al., 2014), their motivation and commitment (Huselid, 1995) and their ability to absorb and utilize knowledge (Laursen & Mahnke, 2001). Scholars have identified various SHR practices that can help in this respect, including staffing, training, compensation benefits (Snell et al., 1996), results-oriented appraisal, employment security, employee voice (Delery & Doty, 1996), delegation of responsibility, integration of functions and job rotation (Laursen & Foss, 2003). If SHR practices are implemented effectively, employees will turn into an noteworthy source of novel idea creation for the firms (Collins & Clark, 2003). Thus, SHR practices can play a critical role in improving innovation performance.

2.2.2. Complementarity of SHR practices and R&D

Complementarity is a fundamental concept in the innovation and strategy literature and offers one approach to explaining patterns of organizational practices, how such practices fit with specific business strategies, and why firms choose divergent strategies (e.g. Antonioli et al., 2013; Ballot et al., 2015; Cozzarin & Percival, 2006; Percival & Cozzarin, 2008). Complementarity is the degree to which the joint use of resources, activities or practices produces a higher total return than could be achieved if each of these was utilized in isolation (Milgrom & Roberts, 1995). Subsequently, introducing R&D without SHR practices or vice versa implies that complementarity effects will not be present and that the technological and human innovation systems will be sub-optimized (Damanpour, 2014).

Firms that invest solely in R&D may become excessively focused on technological development and may forget the human capability that is needed to implement and utilize technological knowledge (Teece, 2010). These firms are also less likely to possess the know-how that is essential to identify, comprehend and integrate new technological knowledge (Chen & Huang, 2009), since the initiation and growth of R&D is strongly affected by the creative human characteristics of firms (Schiuma, 2017). For example, training employees to be more

flexible and allowing them to determine their own task preferences can improve firms' ability to bring in new or improved technologies (Laursen & Foss, 2003).

At the foundation of any technological innovation lie the aspirations, creativity and competences of the people who have imagined, prototyped and tested the new technological knowledge (Schiuma, 2017; Eberhard et al., 2017). By examining the priority which firms give to SHR practices and R&D and the order in which they undertake them, scholars have identified three different ways in which firms see these activities to be related, as shown in Table 2.1.

Table 2.1. Three different ways in which SHR practices and R&D can be related

Perspective	Illustrative references
1. SHR → R&D SHR practices are generally used before the introduction of R&D. I.e., these practices are seen as a necessary requirement for acquiring new or improved technological knowledge.	Laursen (2012); Damanpour & Aravind (2012); Chen & Huang, (2009); Collins & Smith, (2006); Collins & Clark (2003); Laursen & Foss (2003).
2. R&D → SHR R&D generally precedes the introduction of SHR practices. I.e., R&D investment is seen as a necessary requirement for developing SHR practices.	Eberhard et al. (2017); Cruz-Cázares et al. (2013); Teece (2010); Crossan & Apaydin (2010).
3. SHR ↔ R&D SHR practices and R&D are mutually interdependent and are undertaken simultaneously. I.e., the two are seen as complementary and as essential for achieving the desired organizational outcomes.	Rees & Smith (2017); Woudstra et al. (2017); Peter & Robert (2015); Hollen et al. (2013); Mothe & Uyen (2010); Ennen & Richter (2010); Rammer et al. (2009); Schmiedeberg (2008).

Grant (1991) emphasizes that the performance outcomes that firms gain from R&D investment rest on the decisions made by humans and not on the technology itself. Similarly, studies by Woudstra et al. (2017), Adegbesan (2009) and Aral and Weill (2007) show that the key to innovation performance lies in the capacity of firms to complement R&D with rare, difficult-to-imitate, firm-specific advantages embodied in SHR practices. Firms can use SHR practices to affect the behavior and expectations of employees when developing new services and products, and this can eventually enhance innovation performance (Jackson et al., 2014). For example, in order to incorporate novel technological knowledge more efficiently, a

complementary set of SHR practices such as job flexibility, teamwork and employee development can be essential to succeed (Ichniowksi et al., 1997). It is, therefore, essential to comprehend the notion of complementarity in the links between SHR practices and R&D.

2.3. Methods

The research was executed as a longitudinal, exploratory multiple case study. This method is judged to be applicable for this study for various reasons. First, due to the complex nature of SHR practices and R&D and their unknown complementarity effect (Peter & Robert, 2015), in-depth exploration is required. It also allows us to study more than one unit of analysis (individual, management, and firm) and provides a detailed level of inquiry over an extended period of time (Eisenhardt, 1989; Yin, 2013).

2.3.1. Research setting

The research setting in this study is the Port of Rotterdam, the largest port and industrial complex in Europe. The port has obtained this position due to its excellent accessibility from the sea and the many organizations active in the area (OECD, 2016). It provides an interesting setting for our inquiry, given the proximity of firms, the variety of industries and the various social, economic and environmental changes taking place. The port has been affected by two major changes: (1) the transition from fossil fuels to renewable sources of energy (the port's objective is to become carbon-neutral by 2050, reducing carbon emissions by 95%) and (2) the growing usage of digital and emerging technologies. This requires the port to make significant changes since the port currently relies heavily on energy-intensive production processes and is also undergoing various technological changes such as drone inspection on ships, truck platooning and automation of cranes. Firms operating in the port are significantly affected by these two changes and are currently operating in a rapidly changing and ambiguous environment (Van den Bosch et al., 2011). The impact of these changes on the people working in the port is remarkable and the turbulent environment places a premium on both the adaptability and flexibility of employees and of the R&D departments of port firms.

2.3.2. Data collection

We deliberately selected the cases to reflect the wide range of firms and industries within our research setting. We collected data from sixty-eight interviews and secondary data sources (e.g. financial statements, annual reports and newspaper articles) during a two-year period (2017–2018). Forty-two firms were selected for in-depth exploration, each firm representing a case.

We deliberately selected the cases to reflect the wide range of firms and industries within our research setting. Firms were selected based on firm age, size (small, medium and large) and industry, including energy and utilities, business services, wholesale and distribution, and transportation and storage. Table 2.2. provides demographic information on the firms included in this study. For reasons of confidentiality, the names have been disguised.

Table 2.2. Firm demographic information for the year 2017 (firm names disguised for confidentiality)

	Firm	Industry	Established	Employees	Revenue (x 000.000)	Org. structure[a]
1.	DR	Wholesale and distribution	1945	1300	€ 208	Centralized
2.	AM	Offshore	2008	300	€ 30	Decentralized
3.	BR	Wholesale and distribution	1960	800	€ 200	Centralized
4.	MO	Wholesale and distribution	1878	975	€ 441,5	Centralized
5.	CO	Wholesale and distribution	1961	20790	€ 1,163	Centralized
6.	SI	Offshore	1848	243	€ 327	Matrix-Hybrid
7.	HU	Chemical industry	1970	10000	€ 7,188	Centralized
8.	NI	Wholesale and distribution	1872	32008	€ 14,292	Centralized
9.	NE	Wholesale and distribution	2014	500	€ 209	Centralized
10.	LT	Transportation and storage	1990	1030	€ 419,5	Matrix-Hybrid
11.	VO	Transportation and storage	1999	5730	€ 1,306	Centralized
12.	EN	Transportation and storage	2008	153090	€ 66,000	Matrix-Hybrid
13.	AP	Container industry	2000	21000	€ 3,559	Matrix-Hybrid
14.	EX	Chemical industry	1999	72700	€ 210,169	Centralized
15.	CN	Business services	1949	5900	€ 111	Matrix-Hybrid
16.	OO	Transportation and storage	1868	4454	€ 1,530	Centralized
17.	HUI	Business services	1929	2500	€ 444	Matrix-Hybrid
18.	KO	Software and internet	1911	245	€ 1,500	Centralized
19.	EV	Financial services	1994	680	€ 335,4	Centralized
20.	SH	Chemical industry	1907	86000	€ 262,542	Matrix-Hybrid
21.	DC	Business services	1971	500	€ 56	Decentralized
22.	SA	Wholesale and distribution	1991	1520	€ 544,5	Matrix-Hybrid
23.	ST	Business services	1990	715	€ 92,5	Decentralized
24.	PA	Financial services	1932	1164	€ 712	Centralized
25.	BP	Chemical industry	1908	83900	€ 210,411	Matrix-Hybrid
26.	EC	Container industry	1966	1980	€ 2,065	Centralized
27.	UN	Container industry	1971	265	€ 18	Centralized
28.	GA	Business services	2008	4350	€ 892	Matrix-Hybrid
29.	EN	Energy and utilities	1995	3043	€ 3,309	Centralized
30.	CG	Business services	1987	71000	€ 9,320	Matrix-Hybrid
31	ES	Business services	2004	23	€ 7	Decentralized
32.	FA	Financial services	1966	31000	€ 1,243	Centralized
33.	DS	Chemical industry	1902	21054	€ 1,242	Matrix-Hybrid
34.	OD	Chemical industry	1890	3540	€ 731	Centralized
35.	EXA	Software and internet	1984	1619	€ 216	Centralized
36.	EU	Chemical industry	2002	49	€ 12,4	Centralized
37.	NL	Business services	2004	84	€ 13	Decentralized
38.	EB	Transportation and storage	1991	180	€ 45	Centralized
39.	BO	Offshore	1910	10732	€ 2,369	Centralized
40.	AQ	Software and internet	2007	5	€ 0,53	Decentralized
41.	DSR	Financial services	1972	400	€ 1,166	Centralized
42.	OC	Business services	April 2017	7	€ 1,37	Decentralized

[a] *Centralized organizational structure:* top-down decision-making.
Decentralized organizational structure: decision-making is delegated to various people within the organization.
Matrix-Hybrid organizational structure: organization is set up as a matrix. Employees have responsibilities to report to two or more managers or directors.

The interviews were conducted with at least one executive (e.g., senior manager, director, CEO or board member) in each of the firms studied. In several firms, we also interviewed employees and managers from HR, innovation or commercial departments. Additional interviews were conducted with government officials from the national and local authority, with presidents of labor unions, with representatives of employment agencies, and with experts in the field. This allowed us to verify the firm interview data and secondary data sources.

A case study protocol and a semi-structured interview guide with a standard set of questions were used to guide this research. This structured approach facilitated data collection and improved the reliability of the data by ensuring that we were using a consistent interview structure. Interviews were recorded and transcribed and were verified for accuracy by the interviewees. Additional secondary data sources were used for data triangulation. We collected the annual reports and financial statements of each of the forty-two firms included in this study to gather data on R&D expenditure and innovation performance. In addition, industry reports and internal documents such as firm handbooks, HR information and newspaper articles were examined to acquire more knowledge about R&D and SHR practices in the Port of Rotterdam. We stopped our data collection after assembling sixty-eight interviews, forty-two annual reports or financial statements and data from several newspapers, when new insights were no longer being gained and theoretical saturation (Gioia et al., 2013) seemed to have been reached. In Table 2.3, an overview is presented of the data sources per case.

Table 2.3. Data sources (names disguised for confidentiality)

	Firm	Interviewees[a]	Secondary data sources[b]
1.	DR	HR manager	Annual report
2.	AM	Project manager HR	Annual report
3.	BR	Managing director of logistics	Financial statement
4.	MO	HR manager	Annual report
5.	CO	Managing director (1) Business developer (2)	Annual report HR information
6.	SI	Director	Annual report
7.	HU	Managing director	Annual report
8.	NI	Site manager	Annual report
9.	NE	Director of logistics	Financial statement
10.	LT	Managing director	Annual report
11.	VO	HR manager (1) Process operator (2)	Annual report HR information
12.	EN	HR manager (1) Managing director (2)	Annual report
13.	AP	HR manager (1) Location director (2)	Annual report HR information
14.	EX	Advisor for recruitment in the Benelux	Annual report
15.	CO	Project manager HR	Annual report
16.	OO	HR Manager	Annual report
17.	HUI	Corporate recruiter	Financial statement
18.	KO	Corporate HR manager	Annual report
19.	EV	HR manager	Annual report
20.	SH	Anonymous (1) Recruiter (2)	Annual report
21.	DC	HR manager	Annual report
22.	SA	Account manager	Financial statement
23.	ST	HR manager	Annual report
24.	PA	Manager employee development (1) HR manager (2)	Annual report HR information
25.	BP	Team leader of operations (1) Process operator (2)	Annual report HR information
26.	EC	HR manager (1) Team leader and crane driver (2)	Financial statement HR information
27.	UN	Account manager	Annual report
28.	GA	Site manager	Annual report
29.	EN	E-HR developer (1) HR advisor (2)	Annual report
30.	CG	HR manager	Annual report
31.	ES	CEO	Annual report
32.	FA	Recruitment manager	Financial statement
33.	DSR	HR business partner	Financial statement
34.	OD	Policy labor advisor	Annual report HR information
35.	EXA	HR specialist	Annual report
36.	EU	HR manager	Annual report
37.	NL	CEO	Annual report HR information
38.	EB	Service manager	Financial statement
39.	BO	HR manager	Annual report
40.	AQ	Director	Annual report HR information
41.	DS	HR manager	Financial statement

42.	OC	Director	Financial statement
Additional data sources			
	Ministry of National Affairs	Job hunter (1) HR specialist (2)	15 newspaper articles HR information
	Municipality	HR advisor (1) Labor specialist (2)	10 newspaper articles HR information
	Labor union A	Chairman (1) Negotiator (2)	HR information
	Labor union B	Consultant in ports (1) Negotiator (2)	HR information
	Trade union A	Region manager	Firm handbook
	Trade union B	Director	HR information
	Employment agency	HR specialist (1) Labor advisor (2)	HR information Firm handbook
	Employers' association	CEO	Firm handbook
	Consultancy	Director	HR information
	Consultancy	Managing partner (1) Senior consultant (2)	Firm handbook 10 newspaper articles
	High tech firm	Manager recruitment	Firm handbook
		Total interviews: 68	

[a]*This column summarizes the number of informants interviewed and their role within the firm.*
[b]*This column summarizes the types of secondary material collected from each firm and other informants.*

2.3.3. Data analysis

We analyzed data from cases using inductive exploratory analysis (Eisenhardt & Graebner, 2007). Throughout the analysis, we followed the systematic procedure proposed by Yin (2013), which consists of three stages. In the first stage, we carried out a within-case analysis where case profiles were developed for each case individually, using ATLAS.Ti. The software tool helped in two ways. First, it helped in systematically assembling and segmenting the interview transcripts, notes, audio passages and annual reports. Second, it allowed us to extract, benchmark and search for valid and important data.

In the second stage, the constant comparative method was used as proposed by Glaser & Strauss (1967) and later by Gioia et al. (2013) to identify commonalities and differences between the cases. We used open coding and axial coding (Yin, 2013) to code our data. Open coding was used to analyze the real words and language utilized by the interviewees. We grouped the open codes into first-order concepts. Subsequently, axial coding was used to find linkages between the first-order concepts and theoretical perspectives in the literature, to eventually formulate second-order themes (Gioia et al., 2013). This was a continuous process which involved examining and revising the interviews thoughtfully, by drawing on theoretical concepts found in the literature. This process was continued until the patterns were arranged

into the final aggregate dimensions, resulting in theory-building and conceptualization (Eisenhardt, 1989). In Figure 2.1., we present the coding process that emerged from the data.

The third stage consisted of analyzing secondary data such as annual reports, financial statements and newspapers over the period 2010–2017. This allowed us to get an understanding of the firms' R&D expenditure and innovation performance. Technological innovation was measured using R&D intensity (%), which was calculated as R&D expenditure divided by total revenue (average over the period 2010–2017). Innovation performance was calculated as the percentage of total revenue from new or improved services or products developed in the preceding three years (2014–2017).

Figure 2.1. Coding scheme for first-order concepts and second-order themes of SHR practices



2.4. Results

The results of our empirical study show that the firms studied used a set of four distinct SHR practices which we label as (1) flexible working roles (skill and task flexibility), (2) training and development (employee education), (3) employee wellbeing (employee health and happiness) and (4) co-working (intra-firm and inter-firm collaboration). There are numerous examples of how these four types of SHR practices are used by firms in the context we studied. Most noticeable are the changes in the container industry, where new teams, jobs and working roles have been introduced to complement technological developments such as the automation of cranes and the use of robotics. Interviewees also underline the importance of ensuring there is scope in their work for creativity which is needed to complement the new technologies. In the chemical industry, where health and safety are essential aspects of the work, managers emphasize the need to engage employees to prevent workplace injuries and illness. Employees working in the chemical industry thus take a proactive approach in discovering and solving hazards before they result in illness or injury. We also found that employees operating in the energy and utilities industry are increasingly aware of the impact that external developments could have on the future of their jobs and ask for more freedom and flexibility in preparing to work with new technologies and renewable energy sources. As one CEO argued:

> *"Our people make the difference. In the last couple of years, we have invested in the sustainable development of our employees and in ways to create more task-related and flexible jobs to enhance the creative capabilities of our employees."*

The majority of firms emphasized that work is increasingly being divided up in different ways, with the emphasis being on giving more responsibility to employees, and allowing them to adapt tasks to their own capabilities and preferences. In five firms operating in the wholesale and distribution industry, truck drivers were given a certain degree of autonomy to organize their own schedules and working hours. At a coal firm, flexible working roles were introduced, and SCRUM and Six Sigma methods were widely introduced in port service firms. Our data also indicates that firms are increasingly investing in employee wellbeing by fostering an environment that will make work rewarding, stimulating and enjoyable for employees. For instance, port firms provide their own gym facilities, personal trainers, healthy meals and have also introduced measures to encourage cycling to work.

2.4.1. Distinctive organizational configurations through complementarity effects

Our results show that, for employees to complement technological developments, they need to be able to perform the complementary roles required. This entails the implementation of all the four SHR practices discussed above, and combining this with investment in R&D. Several of the firms even argued that investment in R&D leads to improved conditions for employees as it can result in improved training and development facilities and a higher level of pay. As one manager emphasized:

> *"Investments in technology can, on their own, enhance innovation performance, but more so when they are combined with practices that stimulate employee development, authorization, idea generation and knowledge sharing inside but also outside our firm. In the end, we need both to be successful."*

Based on the data, we find that SHR practices and R&D investments tend to be clustered together to form different organizational configurations. As indicated earlier, from our data we were able to identify firms as falling into one of three distinct types of configurations (e.g., Mintzberg & Waters, 1985; Miller et al., 2018), depending on their level of investment in SHR practices and R&D. These were *conventional firms* (low level of investment), *reforming firms* (moderate level of investment), and *game-changing firms* (high level of investment). Table 2.4. provides a summary of the findings for each individual firm and Table 2.5. shows the overall distribution across the three types. Our findings indicate that firms are constantly seeking to achieve greater synergies between their investments in both R&D and SHR practices, and are striving to achieve optimal outcomes in terms of innovation. Firms that invest extensively in either SHR practices or R&D are outliers in this study, and are likely to achieve sub-optimal innovation outcomes compared to firms that focus on both simultaneously.

Table 2.4. Overview of cross-case comparisons

Firm	Firm attitudes towards SHR practices	Drivers of SHR practices	SHR practices used	R&D intensity %	Category
Firm DR	• Doubts over deployment • Fear of losing leadership control	• Cost-reduction	• Flexible contracts, healthy workforce, teamwork • TD budget: 0.03% of total revenue p.a.	0.23	Conventional
Firm AM	• Accepting SHR practices but critical of ways of using them	• Stimulating bottom-up initiatives	• Employee flexibility, employee quality of life, intra- and initially inter-firm co-working • TD budget: 2.6% of total revenue p.a.	1.68	Reforming
Firm BR	• Rejecting SHR practices • Perceived as a waste of time and money	• Improving customer satisfaction	• Adapting job tasks, employee health, internal cooperation • TD budget: 0.8% of total revenue p.a.	0.12	Conventional
Firm MO	• Lack of vision causing chaotic implementation.	• Reducing costs	• Educational programs, internal collaboration. • TD budget: 1% of total revenue p.a.	0.026	Conventional
Firm CO	• SHR practices embedded in the firm's core strategy	• Need to become more innovative	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 1.5% of total revenue p.a.	0.02	Outlier
Firm SI	• Seeking to improve SHR practices together with other organizations in the industry	• Being inspirational	• Focus on job crafting, sustainable development, future skills and inter-firm partnerships • TD budget: 7% of total revenue p.a.	3.1	Game-changing
Firm HU	• Active in developing SHR practices • Bottom-up initiatives	• Employee satisfaction	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 3.5% of total revenue p.a.	1.68	Reforming
Firm NI	• Highly top-down structure • Resistance to novelty	• Process optimization	• Flexible contracts, healthy workforce, teamwork • TD budget: 0.05% of total revenue p.a.	0.38	Conventional
Firm NE	• Management doubts over deployment	• Profit-making	• Flexible contracts, healthy workforce, teamwork • TD budget: 1.2% of total revenue p.a.	0.95	Conventional
Firm LT	• New initiatives perceived as a waste of time	• Exploitation of human resources	• Flexible contracts, healthy workforce, teamwork • TD budget: 1% of total revenue p.a.	0.48	Conventional
Firm VO	• SHR practices primarily focused on middle and higher management	• Achievement of financial returns	• Flexible contracts, healthy workforce, teamwork • TD budget: 1.5% of total revenue p.a.	0.51	Conventional
Firm EN	• Telling their HR strategy to others in the industry	• Leading by exemplary behavior	• Extensive focus on life-long learning, job crafting and sustainable development • TD budget: 5.8% of total revenue p.a.	3.28	Game-changing
Firm AP	• Optimizing the industry through SHR practices	• New external relations	• Inter-firm partnerships and life-long learning • TD budget: 6% of total revenue p.a.	3.95	Game-changing
Firm EX	• SHRM decisions taken at management level	• Cost-reduction	• Flexible contracts, and teamwork • TD budget: 0.6% of total revenue p.a.	0.44	Conventional
Firm CN	• Aware of the need to invest substantially in SHR practices	• Enhance innovation performance	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 2% of total revenue p.a.	0.18	Outlier

Firm OO	• Strong awareness of technological innovation • Little awareness of SHR practices	• Strong returns on R&D investments	• Flexible contracts, healthy workforce, teamwork • TD budget: 1.2% of total revenue p.a.	4.67	Outlier
Firm HUI	• Awareness of SHR practices to enhance innovation	• Firm growth	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 3% of total revenue p.a.	1.13	Reforming
Firm KO	• Active in developing and refining SHR practices	• Enhancing relations with other organizations	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 4.3% of total revenue p.a.	1.32	Reforming
Firm EV	• Aiming to show exemplary behavior to others in the field of HR	• Setting an example in the field of HR	• Creating a learning environment and inter-firm interdisciplinary partnerships • TD budget: 6.9% of total revenue p.a.	4.69	Game-changing
Firm SH	• Need to change due to imminent environmental changes	• Awareness to keep up with technological advances	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 2.5% of total revenue p.a.	1.3	Reforming
Firm DC	• Increasingly aware of SHR practices but still hesitant about using them	• Stimulating bottom-up initiatives	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 3.1% of total revenue p.a.	1.8	Reforming
Firm SA	• SHR practices seen as cost-reductions	• Sales growth	• Flexible contracts and teamwork • TD budget: 0.05% of total revenue p.a.	0.39	Conventional
Firm ST	• Very proactive attitude towards investing in SHR practices and R&D • SHR practices regarded as drivers of increased innovation	• Leading by exemplary behavior	• Job crafting, sustainable development, 21st- century skills and inter-firm partnerships • TD budget: 6.7% of total revenue p.a.	3.76	Game-changing
Firm PA	• Promoting flexibility, adaptability and agility throughout the firm	• Creating a positive change to the world	• Extensive focus on job crafting, sustainable development, and life-long learning • TD budget: 8% of total revenue p.a.	4.0	Game-changing
Firm BP	• Reactive attitude towards investing in SHR practices and R&D • SHR practices at management level	• Improving customer satisfaction	• Flexible contracts, healthy workforce, teamwork • TD budget: 1.3% of total revenue p.a.	0.16	Conventional
Firm EC	• Intending to use SHR practices to restructure and optimize the industry	• Enhancing innovativeness	• Inter-firm co-working and co-existence with other firms, life-long learning • TD budget: 7.8% of total revenue p.a.	4.38	Game-changing
Firm UN	• Resistance to inter-organizational partnerships	• Cost-reduction	• Flexible contracts, healthy workforce, teamwork •TD budget: 0.8% of total revenue p.a.	0.027	Conventional
Firm GA	• SHR practices focused on management level	• Cost-reduction	• Flexible contracts, healthy workforce, teamwork • TD budget: 1% of total revenue p.a.	0.56	Conventional
Firm EN	• SHR practices perceived as innovation enhancers	• Achieving high innovation performance	• Employee flexibility, work-life balance, intra- and initially inter-firm co-working • TD budget: 3% of total revenue p.a.	2.6	Outlier
Firm CG	• Investing in SHR practices to keep up with external developments	• Employee satisfaction	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 2.5% of total revenue p.a.	1.09	Reforming

Firm ES	• Passive attitude • Investments only if CEO feels pressured	• Improving customer satisfaction	• Flexible contracts, healthy workforce, teamwork • TD budget: 0.3% of total revenue p.a.	0.77	Conventional
Firm FA	• Initial bottom-up initiatives by employees	• Turbulent business environment	• Employee flexibility, work–life balance, intra- and initially inter-firm co-working • TD budget: 4% of total revenue p.a.	1.86	Reforming
Firm DS	• Resistance to SHR practices throughout the organization	• Reputational reasons	• Flexible contracts, healthy workforce, teamwork • TD budget: 0.7% of total revenue p.a.	0.20	Conventional
Firm OD	• Management doubts over deployment	• Cost-reduction	• Flexible contracts, healthy workforce, teamwork • TD budget: 1.5% of total revenue p.a.	0.04	Conventional
Firm EXA	• Strong awareness of technological innovation • Little awareness of SHR practices	• Return on R&D investment	• Flexible contracts, healthy workforce, teamwork • TD budget: 0.05% of total revenue p.a.	12.1	Outlier
Firm EU	Fear of losing leadership control	• Reputational reasons	• Flexible contracts, healthy workforce, teamwork • TD budget: 1.8% of total revenue p.a.	0.38	Conventional
Firm NL	• Resistance to inter-organizational partnerships	• Cost-reduction	• Flexible contracts, healthy workforce, teamwork • TD budget: 2.5% of total revenue p.a.	0.19	Conventional
Firm EB	• SHR practices perceived as means of achieving higher profits	• Cost-reduction	• Flexible contracts, healthy workforce, teamwork • TD budget: 0.3% of total revenue p.a.	0.034	Conventional
Firm BO	• New initiatives seldom accepted • Decisions made by directors	• Sales growth	• Flexible contracts, healthy workforce, teamwork • TD budget: 1% of total revenue p.a.	0.64	Conventional
Firm AQ	• SHR practices perceived to be key to responding to external changes	• Stimulating employee mobility	• Adaptable workforce, co-working with competitors • TD budget: 7.2% of total revenue p.a.	3.78	Game-changing
Firm DSR	• Strong awareness of technological innovation • Little awareness of SHR practices	• Gaining returns on R&D investment	• Flexible contracts, healthy workforce, teamwork • TD budget: 2% of total revenue p.a.	0.59	Outlier
Firm OC	• SHR practices perceived to be key to responding to external changes	• Being socially responsible	• Job crafting, and inter-firm co-working • TD budget: not defined, but extensive focus on life-long learning	4.01	Game-changing

Note. TD = training and development

Table 2.5. SHR practices, R&D and innovation performance of conventional, reforming and game-changing firms

	Conventional	Reforming	Game-changing
Firms	19	8	9
R&D investment [1]	< 1%	1 – 3%	>3%
Innovation performance [2]	16.42 %	28.69 %	37.50 %
SHR practices[3] 1. Flexible working roles 2. Employee wellbeing 3. Training and development 4. Co-working	*Low levels of SHR practices* 1. Job security 2. Employee health 3. Low (< 1% of revenue p.a.) 4. No or initial intra-firm co-working	*Moderate levels of SHR practices* 1. Job flexibility 2. Work-life balance 3. Moderate (2–5% of revenue p.a.) 4. Intra-firm co-working and initial inter-firm co-working	*High levels of SHR practices* 1. Employability 2. Sustainable development 3. High (> 5% of revenue p.a.) 4. Extensive intra- and inter-organizational co-creation

* Six firms were categorized as 'outliers', i.e., investing a large amount in either R&D (up to 12% of annual revenue) or SHR practices.
* This study included only the financial measures of firms located in the Port of Rotterdam.
[1] Average annual R&D intensity (%) = average R&D expenses (2010–2017)/average total revenue (2010–2017).
[2] Average % of total revenue from new or improved products or services developed (2014–2017).
[3] SHR practices could not be quantified, so investment in SHR practices is measured by new-to-the-firm practices. The SHR practices can be devided in low levels, moderate levels and high levels of investment.

2.4.2. Configuration 1: Conventional firms

Conventional firms regard investing relatively little in SHR practices and R&D as a way to achieve financial returns and to maximize shareholder value. The results show that conventional firms try to regulate R&D investments and SHR practices in the best way possible, restricting decision-making authority to higher levels in the firm and providing minimal empowerment to employees. Strict rules and regulations apply, making it harder for employees to rotate tasks, jobs or projects within the firm. Firms focus on ensuring compliance with legal regulations, reducing absenteeism, and minimizing the cost per employee. Employees need to be trained, educated, developed, healthy and happy but should primarily be cost-effective. For instance, training budgets (if present) are driven from the top down, and are not individualized; training is provided mainly for economic reasons, and managers decide which programs employees will follow. The firm takes the view that the training costs will be offset by improved sales capability, for example, which will lead to better sales performance. Investing little in both R&D and SHR practices leads to a low level of innovation performance. One executive director commented:

"Human resources are important, and so are R&D investments, but I would rather invest a lot of money in machinery, equipment or outsourcing, because I think that this can help us achieve better innovation performance. This does not mean that I do not trust my people, or that I do not invest at all in R&D. If I invest little in one, I automatically invest little in the other one too."

Another interviewee said:

"SHR practices and new ways of working are absolutely not our business priority. Neither is R&D. We have a strict day-to-day routine to get things done – whether we do this with robotics or people does not necessarily matter in my view. We do not even have a R&D department and our HR department consists of only two people in a firm of more than 400 people. We just invest little in both."

In conventional firms, implementation of SHR practices and investments in R&D were in most cases likely to be the result of direct intervention by a manager or executive director. It appears that managers are supporting the firm in ways that do not include tailoring SHR practices, but rather working with centers of expertise and HR administrative service units to deliver an array of HR services to the firm. This view compels firms to focus on the costs of both R&D and SHR practices. One employee argued as follows:

"In our firm, it is very tough to step out of the comfort zone and to do what you think is best in your job or for the firm. I always have to act by the rules that are set by our board of directors. Sometimes I wish I could be more mobile and have more decision rights. However, our firm is not like that."

One manager commented:

"Whenever I think that my employees need additional education or training to work with new technologies, I tell their supervisors that they have to follow a certain educational program. If I let my employees decide themselves, they will probably come up with irrelevant programs for our firm. We will not invest in training programs when they will not lead to enhanced profit-making."

2.4.3. Configuration 2: Reforming firms

The results reveal that firms categorized as reforming are increasingly committed to adopting both SHR practices and R&D, but are also highly cost-efficient. Reforming firms maintain price competitiveness by being oriented towards profit and aim to grow and expand to new markets and customer domains quickly. New-to-the-firm SHR practices and technologies are tested and implemented, with the aim of developing the firm into a better functional entity. This leads to a self-reinforcing tendency for the firm to seek ways of growing more rapidly without being a first-mover in the market. As one manager argued:

> *"We're technology-driven but we're people-led, so we try to encourage people to come up with the ideas about how we can use and improve the technology and we remove the threat by stating very clearly that we don't intend to reduce their jobs. But we don't want to be the first-mover in the market."*

Another manager argued:

> *"We aim to keep the same number of people over the long term and benefit from our growth trends when it comes to technology. For instance, investing in technology such as e-commerce means also investing in our people. In the end, our people should be ready to work in an e-commerce setting. We do this carefully through training programs and by creating a healthy lifestyle among our people."*

Firms in this category recognize the importance of having a flexible, multi-skilled, and adaptable workforce where employee health, involvement and personal development are complementary factors to investment in R&D. These reforming firms realize that employees play a vital role in central issues such as finance, marketing, operations and technology. Developing a pool of highly flexible people with the talents, competencies, knowledge and skills to perform different tasks in different settings within the firm is becoming increasingly important in reforming firms. A HR manager emphasized:

"We have a so-called 'hard core' and a 'flexible pool' around it when it comes to labor. We have an increasing number of flexible workers, freelancers and people with a zero-hours contract. For us, this is convenient, because every month we look at which employees we need. When we talk about becoming more agile and adaptive to current fast changes, a flexible pool is essential for our future growth."

One of the freelancers argued:

"I do not like the fact that the firm does not offer me a permanent employment contract, but I do like the fact that, being a flexible worker, I can easily work at different firms or on different projects simultaneously. At the same time, I think that I can adapt quicker to technological developments as I learn how to work with different technologies in a diverse set of firms."

In reforming firms, employees are increasingly allowed to take risks and exercise authority. Employees should be able to trust the employer that when they do something slightly out of the ordinary they will not be penalized, but may be rewarded for experimenting, innovating and undertaking self-development.

2.4.4. Configuration 3: Game-changing firms

Game-changing firms achieve high innovation performance through search, experimentation, risk-taking, flexibility and job crafting both through high investment in SHR practices and R&D. The firms explore contemporary possibilities towards new technologies and SHR practices and are strongly oriented towards innovation. Such firms aim to keep the workforce healthy, happy and highly skilled, and seek to promote an environment that makes work rewarding. As such, there is a strong focus on lifelong learning and employee wellbeing as well as on inter-firm labor mobility, flexible working roles and decentralized decision-making. One manager argued that:

"I think that I know how to get the best out of people, but each of my employees is an expert in a specific domain and each employee is unique. I am sure that they are best able to match their skills to their tasks and preferences. In my opinion, job crafting is important for employees to be creative, to complement technological development and to enhance innovation performance eventually."

A manager from another firm said:

"We do not use 360 degrees feedback any longer. To me, that is even outdated. We tend to give continuous feedback in teams and employees are given considerable responsibility for their own work. Our employees are not stupid; they can do things on their own. Whenever they face problems, they know how to reach me. By doing so, we were able to go from 200 cargoes per hour to 500 cargoes per hour."

Widespread employee development is essential in game-changing firms, where human resources are regarded as a core competence that complements investment in technology. For instance, in one of our sample firms, artificial intelligence (AI) systems are used but the analysis of algorithms is done by employees. In another firm, large data sets are translated into accessible knowledge that support the financial decision-making of managers. Other firms use virtual reality to help engineers with their operations, drones to help employees to carry out inspections on boats, and robots to assist employees in distribution centers. Complementing SHR practices with technologies is changing the way employees learn, work and relate to each other. For instance, firms in this category notice that most employees, especially the younger generation, does not intend to spend the rest of their lives in the same firm. Employees want to be flexible and adaptive, and firms should be so, too. This requires a different understanding of human resources in firms as it is less about job security and more about employment security. One of the firms came up with the slogan, "come, grow, go." The HR manager commented:

"Employees come, develop themselves, and go. We can try to keep our employees with extrinsic rewards, yet it is a myth in this era that people stay at one firm all their lives. We should build on the employability of the employees and develop them in the best of their abilities. It is therefore important to exchange employees between firms in the port region to keep the best people in the region."

The results show that game-changing firms are active in inter-organizational co-creation. Firms no longer operate in isolation; they are part of a region and play a role in helping it to flourish. For instance, some game-changing firms in the port area are part of a labor mobility network where employees are exchanged between affiliated firms. An executive director emphasized that:

> *"Co-creation in terms of employment is extremely important at the moment. If I need 50 people with skills x that my neighbor has and my neighbor needs 50 people with skills y that I have, we can exchange people with each other. We have to collaborate with other organizations to be successful."*

2.4.5. Outlier firms

In this study, six firms can be categorized as outliers, investing substantially in either R&D or SHR practices with varied outcomes in terms of innovation performance. Three firms invest heavily in R&D, but little in SHR practices. These firms stressed that technology is becoming a fundamental requirement for a successful firm, and that implementing new technologies is bound to disrupt labor markets and jobs. Managers admit that they face problems with implementing all four SHR practices due to uncertainty over the outcomes, the intangibility of the practices or scarcity of knowledge about how to implement new-to-the-firm practices. For instance, one firm recently invested in an automated assembly line but did not train its employees in how to work with the new technology. The executive director argued that:

> *"We invest extensively in R&D. Our R&D intensity is around 12% annually. We have the technology, but our people are not always able to effectively work with the technology. There is no synergy between the two. It is just a matter of time and many of my people will be replaced by artificial technologies. Yet, our innovation outcome is not very high, so perhaps we should invest more in people."*

Another executive director explained the dilemma as follows:

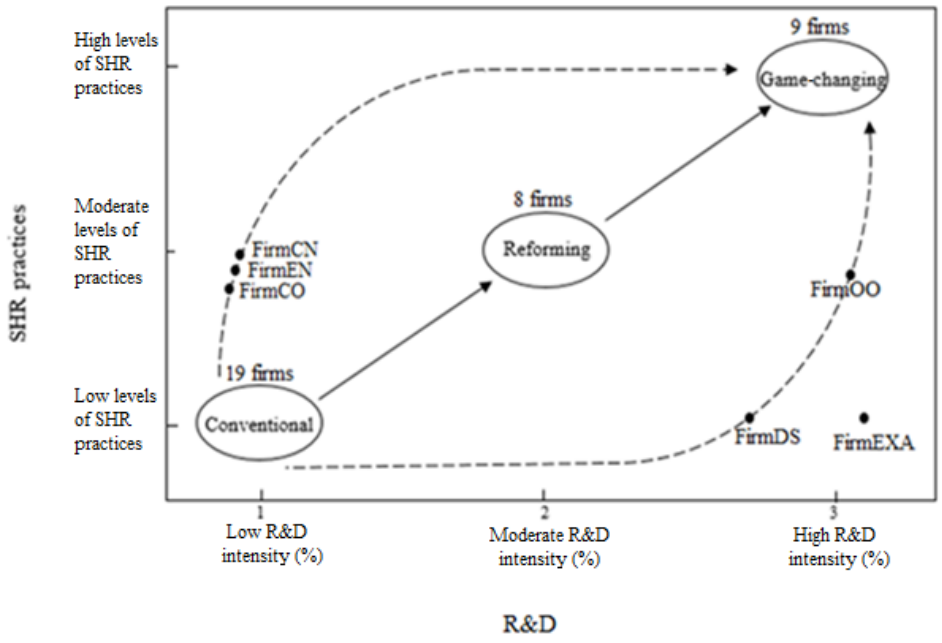
> *"We have invested in an optimization platform that improves user experience and conversion. This included investments in web analytics, goal tracking, digital prototyping, heat mapping and other technological features. We hope to build a powerful platform. My only concern is my people: how will they work with this platform? We should also invest in employment practices to be successful."*

On the other hand, there are also firms that invest heavily in all four SHR practices but much less in R&D. The executives of these firms stress that effective SHR practices are significant in generating positive work behaviors, creativity, knowledge creation, motivation and commitment, all of which eventually lead to more successful innovation for the firm. These firms recognize the importance of all four SHR practices but cannot keep up with the latest technological developments. For instance, in one of the firms, employees are given a wide degree of freedom in their tasks and working hours, there are substantial budgets for training, and employability is high up on the agenda. R&D investment, however, is low for two reasons: The firm lacks knowledge of the latest technological developments and does not regard investing in R&D as a priority. These firms seek to find the key to high innovation performance in the abilities and skills of their employees. As one executive director argued:

> *"We invest heavily in flexible working roles and inter-organizational co-working. However, we lack the knowledge required to get our data-processing systems up to date. This is because we just do not invest enough money and time in R&D. We have always been the market leader in our sector, but we see this slowly declining. I am aware that we should invest in the potential of our employees and in technology."*

We found that some of the firms invest in SHR practices before they focus on R&D, or vice versa. Nevertheless, the executives and managers of the outlier firms emphasized that optimal innovation performance over time is achieved when firms invest strongly in both R&D and SHR practices. Moreover, we found that R&D-intensive firms (i.e., those with more than 3% of their total revenue invested in R&D) tend to also invest more in SHR practices than less R&D-intensive firms (i.e., with less than 1% of their total revenue invested in R&D). Firms with a moderate level of R&D intensity (i.e., with between 1% and 3% of their total revenue invested in R&D) tend to be similarly moderate in their investment in SHR practices. In particular, we find that firms that invest strongly in the four types of SHR practices we identified *and* in R&D have the highest innovation performance outcomes, as presented in Figure 2.2.

Figure 2.2. Organizational configurations and complementarity between SHR practices and R&D



2.5. Discussion and conclusion

We designed this study to fill a rather significant gap in the innovation literature, specifically the need for a theoretically grounded empirical study to explore the complementarity effect of SHR practices and R&D on firm innovation outcomes. Adding to studies by Aral and Weill (2007) and Schmiedeberg (2008), we find that firms can achieve a high level of innovation performance by investing heavily in four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and in R&D. The advantages are therefore greatest for game-changing firms that were able to maximize the synergies between SHR practices and R&D. This requires managerial support, technology and human strategy integration and the creation of a supportive organizational culture. In line with previous studies (Laursen, 2012; Eberhard et al., 2017; Crossan & Apaydin, 2010), we find that several of the firms we studied invest in R&D before they adopt the four SHR practices, or vice versa. However, even when initial investments are made in either one, optimal innovation performance over time is achieved when firms devote a similarly high level of investment to both R&D and SHR practices.

2.5.1. Theoretical contributions

With this study, we make two meaningful contributions. At first, we contribute to innovation research (e.g. Teece, 2010; Cruz-Cázares et al., 2013) by combining both the human and technological perspectives from the innovation literature (e.g., Damanpour, 2014; Jimenez & Sanz-Valle, 2008; Teece, 2010; Damanpour & Aravind, 2012). In particular, we add to research on complementarities (Antonioli et al., 2013; Ballot et al., 2015; Cozzarin & Percival, 2006; Percival & Cozzarin, 2008; Milgrom & Roberts, 1995; Whittington et al., 1999; Volberda & Elfring, 2001) by identifying the complementarity effect of two drivers of innovation performance: R&D and SHR practices. This study helps to better understand the different effects found in the literature on R&D and firm innovation performance (Barge-Gil & López, 2014; Srivastava & Gnyawali, 2011; Teece, 2010; Sampson, 2007) by challenging the notion that innovation performance is derived solely or largely from R&D investment and by showing that innovations related to human resources are equally important in achieving the desired outcomes. We thereby also support the premise underlying the literature on sociotechnical systems which highlights the interaction between people and technology in organizations (Miller & Rice, 1967; Pasmore et al., 1982), as well as Pfeffer's (2005) notion that competitive advantage can be gained through people.

Second, we make an important empirical contribution by reinforcing the findings of previous qualitative studies on the notion of complementarity (e.g. Whittington et al., 1999; Madsen & Ulhøi, 2005; Peter & Robert, 2015) and on the configurational approach (e.g., Miller, 2018; Delmas & Pekovic, 2018; Olson et al., 2018). The configurational approach is based on the idea that "various elements of structures, strategies, practices, processes, environments or ideologies cluster together to form configurations" (Meyer et al., 1993, p. 1175). Recently, Miller (2018) and Delmas and Pekovic (2018) emphasized that the missing aspect in configurational studies are the 'configurations' themselves – the rich thematic categorizations that provide insights into how organizations function. For this reason, we have sought to better understand the complementarity of SHR practices and R&D investments as drivers of innovation performance and have examined how different organizational configurations can be formed through complementarity effects. By doing so, we address the lack of exploratory qualitative studies on this subject (Miller, 2018; Delmas & Pekovic, 2018).

2.5.2. Managerial implications

The study suggests that firms focusing exclusively on technological innovations through investment in R&D to sustain their innovation performance ignore potential sources of innovation that originate from practices relating to human resources (i.e., SHR practices). We are not suggesting that firms should minimize their investment in R&D. Instead, we suggest that firms should strive to capitalize on the technological knowledge they possess while simultaneously investing in the creative minds of their employees. Firms that invest heavily in R&D could alter their strategy to actively pursue a bundle of different SHR practices to increase their chances of achieving high innovation performance.

Firms also have to recognize that the journey towards implementing both SHR practices and R&D is not a static process. Snell et al. (1996) observed that SHR practices emerge over time, rather than having been worked out in detail in advance and staying the same over time. These practices only lead to better innovation performance if they are embedded in the core strategy and strategic policies of the firm (Huselid, 1995). Similarly, R&D is also a continuous process (Barge-Fil & López, 2014), by which lower or higher levels of R&D investment may be needed at different points in time (Heij, 2015). Although we did not study the innovation process, it is likely that firms are on an 'innovation journey', moving from conventional to reforming and eventually to game-changing. Table 2.5. and Figure 2.2. provide managerial guidance on to find or regain optimal complementarity between SHR practices and R&D so that the firm can achieve optimal innovation outcomes.

2.5.3. Limitations and suggestions for future research

There are a few shortcomings in this study, which create possible directions for future research. The first one stems from the fact that we were exploring and analyzing SHR practices and R&D investments instead of testing them. Our methodology required trade-offs that might limit the use and interpretation of the data. Although empirical inductive reasoning has enabled us to arrive at accurate and valid conclusions (Eisenhardt & Graebner, 2007), inductive reasoning can only prove association, not causality. Future research might address this issue by replicating and extending the findings with a larger set of firms, using a quantitative longitudinal research approach to draw causal inferences.

Secondly, most firms are not entirely free in their decisions regarding SHR practices and R&D investment, given the various contingencies they face (Wooldridge, 2010). For instance, rules and regulations may put pressure on firms to invest in certain SHR practices or the headquarter in a foreign country may make decisions for firms operating in the Port of

Rotterdam. Future research could examine the conditions in which firms invest in SHR practices and R&D.

Third, our findings emerge from data collected in a single context and country, which enabled us to perform an in-depth study. However, the results may well be different in other contexts. In addition, using other performance measures would be desirable to track other types of changes over time, such as productivity growth or employee performance. Conducting empirical studies in other cultural contexts would thus allow our conclusions to tested and expanded.

Lastly, a limitation common to firm-level studies is that the response given by an individual respondent may not represent all the various perspectives or situations within the firm as a whole (Chen & Huang, 2009). To minimize this problem, we interviewed a diverse set of managers, executives, employees and experts in the field. This problem may still exist, however, because certain decisions may not be taken in the firms operating in the port of Rotterdam itself but in the headquarters situated abroad. We suggest that it would, therefore, be valuable for further research to address how firms classified as conventional can change to become game-changing.

This study set out to reveal the complementarity effect between SHR practices and R&D. Our results largely support the complementarity and configurational premises, but using a broader range of theoretical perspectives would, in the long run, produce a more complete and useful synthesis. We conclude that R&D is indeed extremely important for innovation success, but that it is not enough on its own. What emerges strongly from this study is that substantial investment in both R&D and SHR practices is important in helping a firm become more successful at innovation.

Chapter 3.

Study II: The micro-foundations of organizational ambidexterity: strategic skill flexibility and employee empowerment

Abstract. Organizational ambidexterity is acknowledged to be critical for a firm's success and survival. However, how firms cope with the dilemmas inherent in combining exploratory and exploitative innovation is still not well understood. In particular, we lack a clear understanding of the micro-foundations of organizational ambidexterity. Ambidextrous organizations require micro-level solutions grounded in individual action. Firms should, therefore, introduce SHR practices that concentrate on (re)creating jobs around a functional flexible employee. We hypothesize that flexibility of employee skills and employee empowerment serve as micro-level antecedents of organizational ambidexterity. We test our hypotheses using survey data from 261 firms operating in the Port of Rotterdam, which is Europe's largest port and industrial region. Our findings reveal that both employee strategic skill flexibility and employee empowerment are essential in fostering organizational ambidexterity. By looking at the micro-foundations of organizational ambidexterity, the study opens up several research opportunities for future research on the role of micro-foundations in achieving organizational ambidexterity.

Keywords: employee empowerment, environmental dynamism, micro-foundations, organizational ambidexterity, strategic skill flexibility.

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The paper is submitted to a peer-reviewed academic journal and is currently under review. Previous versions of the paper were presented at several conferences such as the Strategic Management Society (SMS) in Minneapolis 2019, the Academy of Management (AoM) in Boston 2019, the European Academy of Management (EURAM) in Lisbon 2019 and the Transport Research Society World Conference in Antwerp 2018.

3.1. Introduction to study II

The omnipresent challenge of exploiting existing proficiencies and exploring new opportunities simultaneously, is one of the leading topics in strategy and innovation research (Swift, 2016; Piao & Zajac, 2016; Benner & Tushman, 2015; Jansen et al., 2006). While scholars have long argued that trade-offs are required between exploration and exploitation (March, 1991), organizational ambidexterity tries to resolve this possible discrepancy (e.g., Piao & Zajac, 2016; O'Reilly & Tushman, 2013; Birkinshaw & Gupta, 2013). Organizational ambidexterity is generally recognized in the literature as a firm's ability to exploit and explore simultaneously (Birkinshaw & Gupta, 2013; Piao & Zajac, 2016). Previous studies have highlighted the performance benefits that can be attained by harmonizing high levels of exploitative and exploratory innovation, including higher sales growth rates and better financial performance (Gibson & Birkinshaw, 2004; He & Wong, 2004; Jansen et al., 2009).

Despite the theoretical appeal of organizational ambidexterity, the activities taking place at the individual-level, namely the micro-foundations that affect organizational ambidexterity, are still relatively under-explored (Koryak et al., 2018; Benner & Tushman, 2015; O'Reilly & Tushman, 2013). Micro-foundations have attracted growing interest from innovation and strategy scholars over the past decade (e.g., Felin et al., 2015; Grigoriou & Rothaermel, 2014; Barney & Felin, 2013; Greve, 2013; Foss & Lindenberg, 2013). The central idea in micro-foundations research is to understand how individual-level factors impact organizational-level outcomes (Felin et al., 2012; 2015). A more detailed understanding of individual activities may help to uncover how firms cope with the inherent dilemmas of exploratory and exploitative innovation (Foss et al., 2010).

Making use of Coleman's (1990) 'bathtub' model for micro-macro level relationships, studies on micro-foundations have developed into a theoretical foundation for multi-level reasoning (Felin & Foss, 2005; Foss et al., 2010). Instead of separating macro and micro levels of analysis, Coleman "translates causality into the analysis between the macro- and micro-levels" (Mills et al., 2006, p. 623). Finding a convincing cause and effect relationship in organizational ambidexterity, therefore, involves uncovering the effects of three different types of relationship (Felin et al., 2015): how macro structures affect individuals (macro-micro), how individuals make decisions when facing constraints (micro-micro), and how individuals interact with one another and arrive at macro-level outcomes (micro-macro).

In this study, we extend the emerging discussion on the micro-foundations of organizational phenomena by arguing that ambidextrous organizations require micro-level

solutions at the individual level (Felin et al., 2015). In doing so, we focus particularly on the role of functional flexibility. Rooted in the human resource management literature (Junni et al., 2015; Eisenhardt & Martin, 2000) and in ideas originating from the knowledge-based view (Grant, 1996), organizational phenomena like ambidexterity may eventually be formed and coordinated by the functional flexibility of employees. Functional flexibility has been defined as "having a high level of variety both in the skills of employees and in their decision-making power" (Cordery et al., 1993, p. 706). Functional flexibility, therefore, implies a workforce that is multi-skilled and empowered, with employees being required to support both the exploratory and exploitative activities of firms (Cordery et al., 1991; Lengnick-Hall et al., 2011; O'Reilly, 1992; Desombre et al., 2006). Building on this argument, we aim to uncover how firms achieve organizational ambidexterity by examining how functional flexibility is achieved at the individual level through strategic skill flexibility and employee empowerment.

The theoretical contributions of this study are twofold. First, we enhance the understanding of the micro-foundations of organizational ambidexterity (e.g., Junni et al., 2015; Grigoriou & Rothaermel, 2014) by clarifying the role of employee empowerment and strategic skill flexibility in reconciling the conflicting demands of exploratory and exploitative innovation. We underline the importance of functional flexibility, which adds an important dimension to the literature on micro-foundations (Smith, 2014; Smith & Tushman, 2005). To offer some micro-foundational explanations of organizational ambidexterity, we draw on Coleman's (1990) bathtub framework. Second, we add to prior research that emphasizes how environmental dynamism plays a significant moderating role in the effectiveness of micro-foundations and organizational ambidexterity (Yitzhack et al., 2015; Zahra, 1996; Huang & Kim, 2013). We also make an empirical contribution by testing the relationship between micro-foundations and organizational ambidexterity using a large-scale survey of executives and senior managers from a diverse set of firms in multiple industries.

The remainder of this study is structured as follows. We first review the literature to identify the micro-foundational elements of organizational ambidexterity and develop hypotheses. After that, we present the methods and analyze the results using a regression method. Finally, we elaborate on the theoretical contributions and managerial implications and offer recommendations for future studies.

3.2. Literature review and hypotheses

3.2.1. Exploitation and exploration in organizations

Scholars have found that firms which pursue exploitative and exploratory innovation at the same time, are expected to achieve above average firm performance (Benner & Tushman, 2003; He & Wong, 2004; Gibson & Birkinshaw, 2004). Exploratory innovations are also known as radical innovations aimed at satisfying the demands of new markets and customers (March, 1991; Benner & Tushman, 2003) by concentrating on new structures, processes, designs, experimentation and uncertain alternatives. This necessitates a departure from the firm's existing knowledge in order to search for new knowledge (He & Wong, 2004). Exploitative innovations, on the other hand, are also known as incremental innovations intended to make small improvements to adhere to the demands of current markets and customers (March, 1991; Benner & Tushman, 2003). These innovations extend current firm knowledge, use presently available information and make small improvements to broaden current services or products (Abernathy & Clark, 1985).

While the two types of innovation are both significant for the success of firms in the long run, they can generate paradoxical challenges (Gilbert, 2005). On the one hand, exploitation can create organizational inertia and may thus decrease the firm's ability to prepare for future changes or the embrace novelty (Jansen et al., 2006). On the other hand, exploration can reduce the speed with which existing products or markets are improved (March, 1991). At the employee level, exploration involves activities such as idea generation, idea implementation and searching for new solutions (Gibson & Birkinshaw, 2004; Kang & Snell, 2009). Exploitation, however, involves leveraging the firm's existing knowledge base in order to improve efficiency and efficacy (Benner & Tushman, 2003; Gibson & Birkinshaw, 2004).

Scholars in the field of ambidexterity recognize the importance for firms to pursuit a combination of exploitative and exploratory innovation efforts simultaneously (e.g., Simsek et al., 2009; O'Reilly & Tushman, 2013; Junni et al., 2015; Gibson & Birkinshaw, 2004; Patel et al., 2013). Engaging in ambidexterity allows the firm's experimental activities to be protected from managers' prevailing ways of thinking and from the inertia that may exist in the firm's business operations (Benner & Tushman, 2003). For this reason, organizations that embrace ambidexterity can better accept that seemingly incompatible exploitative and exploratory activities co-exist within the firm (Gilbert, 2005). An important task is to explore how these activities can be integrated in a way that enhances value (O'Reilly & Tushman, 2013).

In line with March's (1991), this study interprets organizational ambidexterity as an organizational-level concept, which is embodied in the firm's exploratory and exploitative innovation efforts. Our definition of organizational ambidexterity focuses on the notion of "dexterity," as proposed by Simsek et al. (2009, p. 868), which refers to realizing high exploration and exploitation innovation performance within the organization as a whole. This can help us in making a distinction between organizational ambidexterity and other related concepts like *contextual ambidexterity*, defined as the "alignment of exploitation and exploration within an entire business unit" (Gibson & Birkinshaw, 2004, p. 211), and *structural ambidexterity*, defined as the "alignment of exploitation and exploration across different business units" (Gibson & Birkinshaw, 2004, p. 213). In line with O'Reilly and Tushman (2013), we regard structural and contextual ambidexterity as ways of organizing that a firm can use to attain organizational ambidexterity.

3.2.2. The micro-foundations of ambidextrous firms

The central idea in micro-foundations research is to understand how the action and interaction of individuals may generate outcomes at the organizational-level and in what way relationships among variables at the micro level are moderated by actions and interactions at the macro level (e.g. Grigoriou & Rothaermel, 2014; Felin et al., 2015; Foss & Lindenberg, 2013; Greve, 2013; Barney & Felin, 2013). Successfully managing the paradoxical challenges of organizational ambidexterity depends on particular skills, abilities and traits of individuals (Andriopoulos & Lewis, 2009; Papachroni et al., 2016).

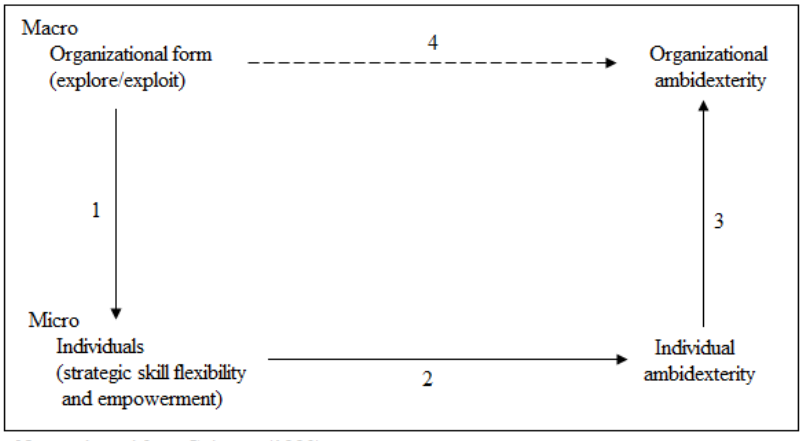
Decisions about innovation activities are taken at the individual level, which is where explanations are provided and also where analysis is undertaken (Smith, 2014; Foss et al., 2010). Lewis et al. (2014) emphasize that skills, decentralized structures, training and coaching help managers and employees to develop a paradoxical mindset – that is, the ability to deal successfully with strategic contradictions. For instance, if employees are able to divide their time at work between both "adaptability and alignment" (Gibson & Birkinshaw, 2004, p. 220), alignment may help them to exploit present knowledge and routines, whereas adaptability may allow them to discover novel knowledge that might be valuable for changing existing practices (Gibson & Birkinshaw, 2004). Eventually it is the people within the organization who are able to exploit improved and new resources (Kang et al., 2012; Wright et al., 2001; Junni et al., 2015).

To develop our micro-foundational explanation of organizational ambidexterity, we build on Coleman's (1990) bathtub framework, as illustrated in Figure 3.1. The framework has

proven to be a theoretical basis for handling multilevel reasoning where relationships are analyzed between the micro- and macro levels (Mills et al., 2006; Foss et al., 2010). The majority of scholars have considered macro-level explanations of organizational ambidexterity (as denoted by arrow 4 in the framework). However, macro-level explanations alone cannot provide several possible other explanations at the lower-level (Minbaeva, 2013). Examining organizational ambidexterity by considering the activities located at the micro-level might, therefore, give better insights than when the analysis is done at the macro-level alone (Foss et al., 2010; Coleman, 1990; Mills et al., 2006).

For this reason, the focus of this study is on arrows 1, 2 and 3 in the framework. Arrow 1 shows the individual's interest and indicates the context within which individual action is taken, given the constraints on such action imposed by rules at the macro level. Arrow 2 indicates the desires and values of individuals and their motivation to attain individual ambidexterity, as determined by the requirement for them to be involved in exploitative and exploratory activities simultaneously. Arrow 3 represents the way in which a balance between individual exploratory and exploitative decisions can be important in explaining how organizational ambidexterity is realized at the macro level. In this regard, the organizational context can allow employees to focus on the exploratory and exploitative parts of their job. The context has to be an inspirational and enabling one in order to stimulate all employees of the organization to decide on their own in what way they can best split their time and effort between exploratory and exploitative activities (O'Reilly & Tushman, 2013; Gibson & Birkinshaw, 2004). As such, we focus on arrows 1, 2 and 3 of Coleman's (1990) framework to study the micro-level dimension of organizational ambidexterity.

Figure 3.1. A cross-level model of organizational ambidexterity, combining macro-micro and micro-macro levels of analysis



Note: adapted from Coleman (1990).
In this paper we focus on arrows 1, 2 and 3. Arrow 4 is therefore dashed.

3.2.3. Reinforcing integrative thinking across exploitative and exploratory innovation activities: the role of functional flexibility

The simultaneous implementation or coordination of exploratory and exploitative innovation activities requires new ways of organizing and new collective patterns of interaction (Smith & Tushman, 2005; Sirmon et al., 2007; Tushman & O'Reilly, 1996; Helfat & Peteraf, 2003). For instance, Lewis et al. (2014) emphasize that the skills of executives in top management teams and the interactions between them help to integrate exploitative and exploratory activities within the firm. This implies that certain individual-level practices need to be effectively incorporated and coordinated in order to attain new arrangements of exploitation and exploration in the organization (Sirmon et al., 2007). Reinforcing integrative thinking across exploitative and exploratory activities within organizations, therefore, entails flexibility at the employee level.

Functional flexibility is important for the development and coordination of organizational ambidexterity (Friedrich et al., 1998; Junni et al., 2015; Grant, 1996). It entails the use of practices designed to give employees more authority and to encourage strategic skill flexibility (Lengnick-Hall et al., 2011). This enables employees to undertake a broader range of tasks and gives them more flexibility, because they are given greater control and freedom of choice within their work (Desombre et al., 2006). Functional flexibility empowers employees, giving them the skills and behaviors required to serve both existing and new customers and markets (Lengnick-Hall et al., 2011). This requires a bottom-up approach, indicating the benefit and significance to involve employees in the process of attaining organizational ambidexterity (Yoon & Chae, 2012; Wright et al., 2001; Eisenhardt & Martin, 2000). Hence, to uncover how firms realize ambidexterity, we examine how functional flexibility works at the micro level in terms of strategic skill flexibility and employee empowerment.

3.2.4. Strategic skill flexibility and organizational ambidexterity

Strategic skill flexibility is defined as "an individual trait or characteristic of potential alternative uses to which the skills can be applied and redeployed quickly" (Wright & Snell, 1998, p. 761). For employees, this involves acquiring a broad range of skills allowing them to adjust or modify their skills to satisfy the conditions of particular situations or tasks (Wright et al., 2001; Hansen et al., 2019).

Flexibility in skills encourages employees to perform various tasks within the organization and enables them to learn new tasks (Wright & Snell, 1998; Morgeson et al., 2005). It offers opportunities for employees to experiment and tryout new ideas (Amabile et al., 1996), and

allows employees to manage the concerns that are involved in balancing exploitative and exploratory innovation activities (Griffin et al., 2007). Preenen et al. (2017) argued that the skill flexibility of employees may enhance training and development, which is favorable for both exploratory and exploitative innovation outcomes in firms. They found that skill flexibility enhances exposure to "a variety of tasks, situations, people and experiences, enabling individuals to develop new or improved products, services or processes" (Preeenen et al., 2017, p. 276). Similarly, van der Sluis (2004) found that strategic skill flexibility stimulates employees' cognitive and learning behaviors, which are beneficial for knowledge creation and for fostering a culture of innovation within firms.

Having a broad spectrum of skills enables employees to anticipate and quickly respond to changes by finding new combinations of knowledge and adapting current configurations to provide different product and service variations (Worren et al., 2002; Martínez-Sánchez et al., 2011; Shalley et al., 2004; Eisenhardt & Martin, 2000; Zhou, 2003). In this way, strategic skill flexibility of employees may enhance behavior in which managers perceive no direct competition regarding the allocation of conflicting efforts (Martínez-Sánchez et al., 2011). Employees in ambidextrous organizations are thus expected to acknowledge that exploratory and exploitative activities may be different, ambiguous and even conflicting and find ways of translating them into workable strategies (Shalley et al., 2004; Zhou, 2003).

Strategic skill flexibility may also motivate employees to develop their capacity for critical thinking, help resolve issues and give answers to complicated matters in ambidextrous organizations (Wageman, 1995). This can diminish potential rivalry between individuals and may enable cooperation and commonalities across the firm's various innovation activities (Bhattacharya et al., 2005). The strategic skill flexibility of employees can, therefore, help to resolve conflicts over how resources are allocated and combined within a firm in order to achieve organizational ambidexterity. We thus hypothesize as follows:

> *Hypothesis 1. The strategic skill flexibility of employees is positively correlated with organizational ambidexterity within firms.*

3.2.5. Employee empowerment and organizational ambidexterity

Employee empowerment is a multifaceted phenomenon that has been defined as "the freedom and the authority that is given to employees to perform and control their tasks to the best of their abilities" (Bowen & Lawler, 1992, p. 33). It is associated with increased intrinsic task motivation stemming from an employee's sense of self-determination, meaning and

competence (Thomas & Velthouse, 1990). It can provide firms with numerous ways of strengthening its problem-solving capacity and can help in finding new and useful combinations of knowledge that can be used to provide unique benefits to the organization itself and to customers (Staw & Boettger, 1990). By giving employees autonomy, firms enable them to become more entrepreneurial and creative and to experiment with elements, processes and structures, so that these can be reconfigured in new ways (Levin & Sanger, 1994). For example, some firms have established field labs, knowledge hubs and idea rooms where employees can streamline, modify and reinvent ways of working, ideas and organizational processes. This stimulates employees to make more effort to be creative, collaborate and share knowledge and information.

Employee empowerment increases collaborative problem-solving and may help employees and executives to enhance their understanding of the particular preferences of individuals and conflicting roles within the firm (Çakar & Ertürk, 2010). It also stimulates critical debate and helps to resolve tensions between executives, allowing employees to then evaluate and reconfigure particular combinations of knowledge within the firm (Kang et al., 2012). Resolving these tensions is crucial in giving the firm the capacity to generate synergetic value and to reinforce integrative thinking across exploitative and exploratory innovation activities (Teece, 2007). The empirical studies of Çakar and Ertürk (2010) and Spreitzer (1996) show that employee empowerment encourages initiative and makes employees more willing to come up with new ways of combining exploration and exploitation.

Another reason why employee empowerment may enhance organizational ambidexterity is that it gives employees a greater feeling of trust and fairness, and makes them more motivated and committed to the firm (Borins, 2000). This may help people within the firm to achieve a common ground, which can help to enhance mutual agreement and understanding (Zhou et al., 2013). Similarly, employee empowerment may reduce communication barriers within the firm, reduce misunderstandings, and can improve knowledge transfer and increase collaboration between multidisciplinary teams (Thomas & Velthouse, 1990). Executives can evaluate alternative ways of reconciling conflicting goals and can recognize opportunities and synergies that can be achieved by combining exploratory and exploitative innovation within the firm. We, therefore, hypothesize that:

> *Hypothesis 2. Employee empowerment is positively correlated with organizational ambidexterity within firms.*

3.2.6. The moderating role of environmental dynamism

The importance of environmental dynamism in terms of organizational outcomes has been identified in the organizational literature (Droge et al., 2008; Jansen et al., 2006; Patel et al., 2013). Environmental dynamism is defined as "the degree of variability and instability and the rate of change (e.g. changes in technology or customer preferences) in the external environment" (Dess & Beard, 1984, p. 54). In environments that are highly dynamic, products and services quickly become obsolete (Teece, 2007; Song et al., 2005) and firms have to respond quickly to unforeseen changes (Droge et al., 2008). This requires flexibility in employee skills that govern the adaptation and creation of knowledge (Eisenhardt & Martin, 2000; Song et al., 2005).

Employees who face high levels of environmental dynamism are often more receptive to acquiring a broad repertoire of skills, because the market requires them to act more flexibly and to be more reactive and change-oriented in order to survive (Droge et al., 2008). In fact, Way et al. (2018) argue that strategic skill flexibility will be most effective when there is a high level of environmental dynamism, because this creates crisis situations in the human brain that stimulate the individual's capacity to enhance both exploratory and exploitative innovation. Strategic skill flexibility can, therefore, be beneficial for firms, helping them to keep up with the frequent incremental and radical changes in dynamic environments (Bhattacharya et al., 2005). In highly dynamic environments, employees with a broad range of skills are also better capable of diagnosing market opportunities and in helping to prevent the firm's assets from becoming obsolete (Lengnick-Hall et al., 2011). Similarly, strategic skill flexibility encourages employees to recognize a dynamic environment as a source of opportunity, which is desirable to serve the emerging needs of customers or to pioneer new products to outperform competition (Bhattacharya et al., 2005).

Furthermore, in highly dynamic environments organizations can remain viable by constantly redesigning and renewing their practices, resources and processes (Helfat & Peteraf, 2003). For instance, Jansen et al. (2006) argue that, in such conditions, employees are more eager to take the initiative to make incremental changes and explore new opportunities. This argument suggests that strategic skill flexibility enables employees to help create a culture of continuous adaptation and exploration (Martínez-Sánchez et al., 2011; Eisenhardt & Martin, 2000). Teece (2007) endorses this view, adding that, when employees have strategic skill flexibility, they are able to continuously align their skills to the changing environmental needs. In dynamic environments employees with strategic skill flexibility use their wide range of skills, because there is a shared feeling that simultaneous pursuit of exploitative and

exploratory innovation is needed for the firm's existence. We, therefore, suggest that the positive relationship between strategic skill flexibility of employees and organizational ambidexterity will be amplified by environmental dynamism. Hence, we hypothesize that:

> *Hypothesis 3. Environmental dynamism positively moderates the effect of strategic skill flexibility on organizational ambidexterity in such a way that it strengthens the relationship between them.*

While dynamic environments may strengthen the effect of strategic skill flexibility on organizational ambidexterity, they can also interrupt the way employee empowerment affects organizational ambidexterity. Empowered employees might feel pressured to focus solely on exploratory innovation in order to develop creative solutions to keep up with, or stay ahead of competitors in the constantly changing environment (e.g., Doolen & Hacker, 2005; Spreitzer, 1996). Empowered employees might also inspire line managers to develop new ideas for radical changes designed to help the firm keep up with environmental developments, and might become even detrimental to exploitative innovation (González-Benito et al., 2010).

Dynamic environments may disrupt the structures that support routine operations, processes, responsibilities and the balance of power within the firm (Burns & Wholey, 1993). This creates uncertainty and upheaval among empowered employees, who lack a particular control mechanism that corrects and manages employee behavior in tempestuous times (Parker & Collins, 2010; González-Benito et al., 2010). Moreover, this lack of control also makes employee empowerment have less of a positive effect on the ability of a firm to achieve organizational ambidexterity. For instance, given the frequent environmental changes, employees might find themselves less able to coordinate and align their decisions about exploration and exploitation, making it less likely that the firm will achieve organizational ambidexterity. There is thus no common basis of understanding which employees or business units are focusing on exploitative or exploratory innovation activities (Hansen, 2002).

Doolen and Hacker (2005) found that semi-conductor and equipment manufacturers derived more benefit from employee empowerment when operating in less dynamic environments, as it was easier for them to use lean processes. In a stable environment, with less ambiguity and more predictability, being empowered enables employees to spot impending changes and to suggest both incremental and radical ways of responding or of dealing with problems (Azadegan et al., 2013). Similarly, empowered employees may find it easier to cope with the polarized nature of exploration and exploitation in less dynamic environments

(González-Benito et al., 2010). In stable environments, empowered employees can reduce the likelihood of conflicts over goals and implementation (Doolen & Hacker, 2005). Accordingly, when environmental dynamism is high, employee empowerment will probably not resolve the paradoxical challenges of exploitative and exploratory innovation activities to realize organizational ambidexterity. We, therefore, hypothesize that:

> *Hypothesis 4. Environmental dynamism negatively moderates the effect of employee empowerment on organizational ambidexterity in such a way that it weakens the relationship between them.*

3.3. Methods

3.3.1. Research Setting and Data Collection

Data was obtained using a large-scale survey instrument. We used the Dutch Chamber of Commerce database to randomly identify a sample of 4,500 firms. The sample included a wide range of industry sectors and covered both public and private firms operating in the greater Port of Rotterdam area, one of the largest ports and industrial regions in Europe. This region is an interesting field of inquiry primarily due to the density of business activities and the involvement of firms from various sectors. We separated our measurement of the dependent and independent variables and controlled data for two distinct periods of time (2016 and 2018) in order to prevent possible difficulties with the common method bias and single-informant bias.

In 2016, we distributed a survey to executive directors and senior managers in a random sample of 4,500 firms. Executive directors and senior managers from 564 firms finished the survey, representing a response rate of 12.5%. In 2018, two years after the initial survey, a second one was distributed to the same 564 firms. We received the surveys from 282 executive directors and senior managers, which implies 50% of the initial response. This can be considered as a common response rate in empirical studies targeting executive directors and senior managers (e.g., Lepak et al., 2003; Burgers et al., 2009). We removed 21 observations with incomplete responses on innovation measures, leaving us with a total of 261 useful observations for data analysis. This sample size is in agreement with several other studies in management science (e.g., Jansen et al., 2009; Schilke, 2014).

The average tenure of the informants in the sample was 14.17 years (s.d. = 10.19). The average age of the firms was 27.59 years (s.d. = 24.81) and the average number of full-time employees was 166.50 (s.d. = 59.06). The sample included a broad variety of industry sectors, including chemical (9.1%), metal, machine-building and electro-technical (9.8%), energy production and waste management (11.4%), infrastructure-building (10.6%), shipbuilding and reparation (14.2%), wholesale business (9.4%), rail and water distribution (8.3%), container and trans-shipment (14.2%), and maritime services (13.0%).

Non-response bias was tested in our sample by examining the variances in the answers of the respondents and the non-respondents. No significant variation could be found based on firm size, innovation outcomes, full-time employment and prior firm performance. In addition, we checked for differences in answers between the respondents that completed the survey early and the ones that completed the survey late. We were not able to uncover any differences in early and late respondents as the values were insignificant ($p > 0.05$). This revealed that non-response bias was most likely not an issue. To prevent response bias and to diminish any reliability problems in this study, we also conducted several interviews with executive directors, managers and employees from 16.53% of the firms studied in 2016 and 2018. The interviews verified the findings of the surveys. We examined the "intra-class correlation coefficient (ICC)" (McGraw & Wong, 1996, p. 31) for the variables included in the study. We used the independent variables and the moderator of the data collected in 2016 and the dependent variable of the data collected in 2018. The ICC for strategic skill flexibility (0.86), employee empowerment (0.87), dynamic environment (0.76) and organizational ambidexterity (0.93) suggest that the responses given by different participants to the same item are very similar. The correlations in this study are consistently significant ($p < 0.01$) as the ICC presented a high level of interrater reliability.

3.3.2. Measurement of constructs

The measurement scales were adapted from several studies in the field of management and organizational science.

Dependent variable: organizational ambidexterity. Following prior studies (He & Wong, 2004; Jansen et al., 2009; Gibson & Birkinshaw, 2004) we took several steps to measure organizational ambidexterity. First, we used the measure for *exploratory innovation* ($\alpha = 0.79$), which was adapted from the study of Jansen et al. (2006). A scale of four items that emerged measures the degree to which firms enter into new markets or search for new customers by using new knowledge. Second, we used the measure for *exploitative innovation* ($\alpha = 0.77$),

which was a four-item scale that was also adapted from Jansen et al. (2006) and captures the extent to which firms use current knowledge to meet the demands of current customers and markets (Smith & Tushman, 2005).

Subsequently, we combined exploitative innovation and exploratory innovation into one single index by multiplying, adding and subtracting exploitative innovation and exploratory innovation. Following Edwards (1994) and Jansen et al. (2009), the F-values based on R^2 variances were measured between the different single indexes. The model that multiplied exploratory innovation and exploitative innovation demonstrated to be the preferable measure ($R^2 = 0.31$), compared to the model that subtracted ($R^2 = 0.16$) and added ($R^2 = 0.18$) exploitative and exploratory innovation. By analyzing the results from Edwards's (1994) test, we decided to measure organizational ambidexterity by multiplying exploitative and exploratory innovation.

Independent and moderating variables. *Strategic skill flexibility of employees* ($\alpha = 0.86$) was measured by means of a scale consisting of seven items that was developed by Bhattacharya et al. (2005). This construct measures whether employees master different skills that are applicable to a wide variety of tasks. *Employee empowerment* ($\alpha = 0.87$) was measured using Spreitzer's (1995) twelve-item scale. This well-known scale measures the autonomy and control given to employees. *Environmental dynamism* ($\alpha = 0.73$) was measured utilizing a scale consisting of five items that was devised by Volberda and Van Bruggen (1997). The scale captures the degree of unpredictability, instability and change in the external environment. The scale items are shown in the appendix.

Control variables. In this study, appropriate control variables were used to control for possible side effects.

At first, it is widely acknowledged that firm size can have an influence on the degree to which exploitation and exploration is used within firms (He & Wong, 2004). For this reason, we controlled for *firm size*, which was measured by taking the logarithm of the number of full-time employees in the firm. Second, since older firms might have more access to resources but might be less adaptive or flexible to change and to embrace novelty (Jansen et al., 2009), we included *firm age* as a control variable. Third, firms with a strong strategic posture are naturally more motivated to involve in simultaneous exploratory and exploitative innovation activities (Laforet, 2008; Ozsomer et al., 1997). That is why we included *strategic posture* as a control variable. Fourth, firms with a history of strong performance are possibly better able to achieve organizational ambidexterity (Jansen et al., 2006). We, therefore, included *firm's past performance* as a control, measuring it by using the firm's net growth in income over the last

three years. Fifth, since organizations with different units can specialize in either exploration or exploitation to achieve ambidexterity at the organizational level (Burgers et al., 2009), it is essential to control for *structural ambidexterity*. In doing so, we control for whether firms are to achieve economies of scale through structural differentiation i.e. by having a separate innovation department (Raisch & Birkinshaw, 2008). Lastly, scholars have often used R&D investment as a control variable as investing in technological know-how might impact the degree to which firms are able to pursue both exploitative and exploratory innovation efforts (e.g., Berchicci, 2013). Hence, we included *R&D investment* as a control variable, which has been defined as the amount of money a firm spends annually to develop new products or services (Cruz-Cázares et al., 2013).

3.4. Results

The descriptive statistics and correlations of the variables included in this study are presented in Table 3.1. The outcomes of the hierarchical regression analyses are presented in Table 3.2. We first mean-centered the independent variables and measured the variance inflation factors (VIF) for every variable included in this study (Aiken et al., 1991) to diminish multicollinearity problems. The minimum VIF in our study was 1.025, with a 0.98 collinearity tolerance, and the maximum VIF was 1.34, with a 0.77 collinearity tolerance. The VIF scores are far below the acknowledged maximum value of 10 (Neter et al., 1990).

Table 3.1. Descriptive statistics and correlations[a]

	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Organizational ambidexterity	22.7	8.18	1									
2. Strategic skill flexibility	4.76	0.87	0.28**	1								
3. Employee empowerment	5.09	0.69	0.15*	0.23**	1							
4. Environmental dynamism	4.79	1.03	0.28**	0.14*	0.13	1						
5. R&D investment	0.85	0.21	0.24**	0.07	0.01	0.15*	1					
6. Strategic posture	4.06	1.00	0.34**	0.27**	0.10	0.31**	0.30**	1				
7. Firm age	27.60	24.63	-0.04	-0.01	0.05	0.12	-0.06	0.01	1			
8. Firm size[b]	1.72	0.63	0.24	0.08	-0.12	0.17*	0.34	0.20**	0.12**	1		
9. Past performance	4.55	1.29	0.12	0.17**	0.16*	0.09	-0.01	0.24**	-0.07	0.03	1	
10. Structural ambidexterity	5.98	0.85	0.03	-0.05	0.02	-0.02	0.07	-0.10	-0.12	- 0.25**	-0.14*	1

*. Correlation is significant at the 0.05 level (two-tailed).

**. Correlation is significant at the 0.01 level (two-tailed).

[a] N=261, [b] log number of full-time employees

Table 3.2. Results of the hierarchical regression analyses: strategic skill flexibility, employee empowerment, environmental dynamism and organizational ambidexterity

		Organizational ambidexterity		
		Model 1	Model 2	Model 3
Control variables				
Strategic posture		0.28***	0.24***	0.22***
R&D investments		0.15**	0.15**	0.14**
Past performance		0.03	0.02	0.01
Firm age		-0.04	-0.04	-0.05
Firm size		0.12*	0.19*	0.06
Structural ambidexterity		0.05	0.04	0.05
Independent variables				
Strategic skill flexibility	H_1		0.14**	0.16**
Employee empowerment	H_2		0.09*	0.05*
Moderating variable				
Environmental dynamism				0.15**
Interactions				
Strategic skill flexibility * Environmental dynamism	H_3			0.13*
Employee empowerment * Environmental dynamism	H_4			0.11
R^2		0.15***	0.18***	0.22***
$\triangle R^2$			0.07***	0.05**

Note. Standardized regression coefficients are reported
* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

Model 1 includes the control variables presented in Table 3.2. Model 2 contains the independent variables strategic skill flexibility and employee empowerment. Model 3 includes the moderator, i.e., environmental dynamism, and the interaction effects. Although we explicitly theorize an external condition as the moderating variable, we also conducted a mediation analysis (adjusted $R^2 = 0.18$), but we could not find a significant effect for the mediation analysis. This further supports our point of view that environmental dynamism has a moderating effect.

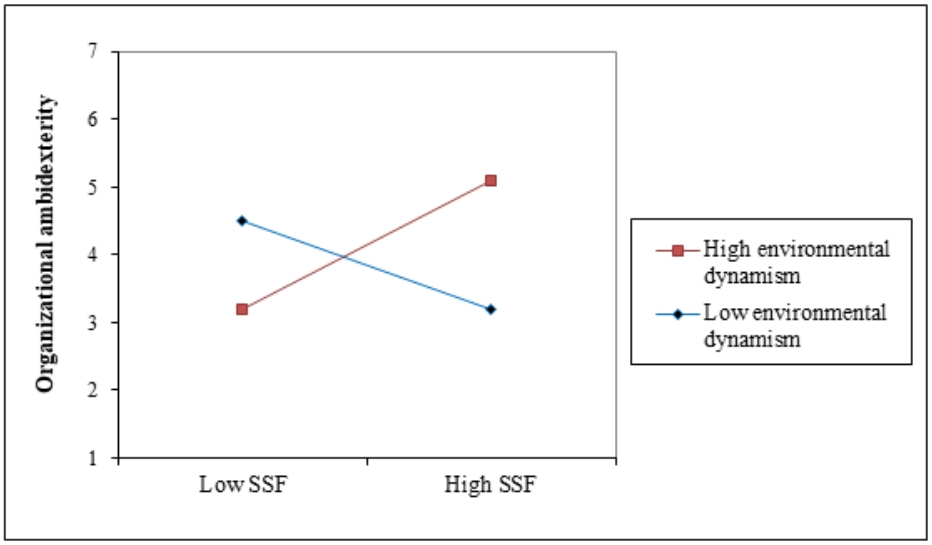
Model 2 shows that strategic skill flexibility is positively and significantly related to organizational ambidexterity ($\beta = 0.14$, $p < 0.01$), supporting Hypothesis 1. Our findings indicate that strategic skill flexibility of employees enhances the ability of firms to both exploit and explore simultaneously. Additionally, model 2 shows that the coefficient of employee empowerment on organizational ambidexterity is positive and significant ($\beta = 0.09$, $p < 0.05$). Hypothesis 2, which posits that employee empowerment facilitates the achievement of organizational ambidexterity, was thus supported.

Model 3 demonstrates a positive and significant effect for the interaction between environmental dynamism and strategic skill flexibility ($\beta = 0.13$, $p < 0.05$), hence supporting Hypothesis 3. Consistent with hypothesis 3, model 3 demonstrates that the relationship between strategic skill flexibility and organizational ambidexterity is positive and significant when environmental dynamism is high. This indicates that, under these conditions, strategic skill flexibility of employees could facilitate the recombination of diverging and contradictory exploratory and exploitative activities in the firm. Figure 3.2. shows the interaction plot. This plot displays that the relationship between strategic skill flexibility and organizational ambidexterity is positive and significant when environmental dynamism is high, being consistent with Hypothesis 3.

Furthermore, the results show that firms trying to develop strategic skill flexibility of employees in more stable environments (e.g., with low levels of environmental dynamism) score lower on organizational ambidexterity. As shown in model 3, there is no significant interaction effect between employee empowerment and environmental dynamism ($\beta = 0.11$, NS). Hypothesis 4 is, therefore, not supported. Thus, we did not find enough evidence to conclude that firms that make use of employee empowerment in dynamic environments are likely not able to achieve organizational ambidexterity. Although this was not part of our hypotheses, our results do show that the direct relationship between environmental dynamism and organizational ambidexterity is positive and significant ($\beta = 0.15$, $p < 0.01$). This implies

that environmental dynamism is positively and significantly related to balance and simultaneously pursue exploratory and exploitative innovation activities within firms.

Figure 3.2. The moderating effect of environmental dynamism



Note: SSF = strategic skill flexibility

3.5. Discussion and conclusion

While studies on organizational ambidexterity have traditionally focused on the macro level, there is considerable scope to explore the micro-level activities that affect organizational phenomena such as ambidexterity (e.g., Huang & Kim, 2013; O'Reilly & Tushman, 2013; Koryak et al., 2018; Barney & Felin, 2013; Benner & Tushman, 2015; Felin et al., 2015). Extending the emerging discussion on the micro-foundations of organizational phenomena, the aim of this study was to explore how firms can achieve organizational ambidexterity through such micro-level activities, specifically those relating to strategic skill flexibility and employee empowerment.

3.5.1. Theoretical contributions

This study contributes to the literature in a number of ways. First, this study adds to the literature on the micro-foundations of organizational phenomena (e.g., Grigoriou & Rothaermel, 2014; Foss & Lindenberg, 2013; Felin et al., 2015; Greve, 2013; Junni et al., 2015,

Barney & Felin, 2013; Teece, 2007). We focus on the role of individual-level activities associated with employee functional flexibility and on how these provide important micro-foundations for macro-level outcomes. By utilizing Coleman's bathtub framework to explore these micro-macro links, we find that functional flexibility, in terms of strategic skill flexibility and employee empowerment (e.g., O'Reilly, 1992; Cordery et al., 1991; Desombre et al., 2006; Friedrich et al., 1998; Lengnick-Hall et al., 2011), can be important explanations for the achievement of organizational ambidexterity.

Our results show that both strategic skill flexibility and employee empowerment are important in helping firms to realize integrative value of their exploitative and exploratory innovation, and thus to achieve organizational ambidexterity. A possible explanation could be that both strategic skill flexibility and empowerment broaden knowledge usage and help employees to reconcile conflicts of interest between exploration and exploitation and to resolve any issues that may arise (Zhang & Bartol, 2010; Patel et al., 2013). Our research, therefore, enriches the field of HRM (Way et al., 2018; Hansen et al., 2019) and also contributes to the knowledge-based view (Grant, 1996) by demonstrating the important role that individuals play in creating and refining knowledge in order to achieve organizational ambidexterity (e.g., Minbaeva, 2013; Junni et al., 2015; Felin et al., 2015; Xiu et al., 2017).

Second, extending previous organizational research (Huang & Kim, 2013; Zahra, 1996), our study highlights the moderating role of environmental dynamism in achieving organizational ambidexterity. Our study adds to the contingent view of organizational ambidexterity by examining ambidextrous organizations in dynamic environments (Yitzhack et al., 2015; Huang & Kim, 2013). When the environment is highly dynamic, having flexibility and continuously renewing the knowledge base of employees is acknowledged to be essential for enhancing innovation (Kraaijenbrink et al., 2010). A firm may draw on the skill flexibility of its employees to pioneer new products, services or markets and to increase efficiency through restructuring and process optimization (Bhattacharya et al., 2005).

Interestingly, though, this study does not support the findings of previous studies (González-Benito et al., 2010; Doolen & Hacker, 2005) which proposed that the relationship between employee empowerment and organizational ambidexterity is negatively affected by environmental dynamism. A possible explanation for the insignificant effect we get, may be due to the time span of environmental dynamism. It is likely that during longer periods of environmental dynamism, firms might find themselves stuck into developing mainly fundamentally new services or products for new customers and markets, and this might hamper exploitative innovation. It is, therefore, essential to examine the moderating role of

environmental dynamism over longer periods of time. This study also offers new empirical insights concerning the importance of organizational ambidexterity, and we address the scarcity of large-scale empirical studies on this topic among a diverse set of executives and senior managers in multiple industries (Huang & Kim, 2013). Using a hierarchical regression model enabled us to accurately study the micro-level dimension of organizational ambidexterity.

3.5.2. Managerial implications

Our research has various managerial implications for executives, senior managers, innovation managers and HR staff. As with previous studies (Felin et al., 2015; Foss & Lindenberg, 2013), the findings of this study suggest that it is crucial for firms to strategically balance exploitative and exploratory innovation activities in order to respond appropriately to varying environmental demands and to create a mutual reference frame. The role played by individuals in decision-making relating to exploration reflects their generally entrepreneurial and creative approach, in contrast to the goal-driven, predictive and risk-averse approach used in exploitation.

It is also important for firms to create an organizational environment that is favorable for both idea generation as well as process optimization. This may have implications for organizational aspects such as governance structures, employee evaluation procedures and reward systems. Ignoring individual-level aspects may also impede the effectiveness of the organization. Hence, firms need to create a workforce with a broad skills base, where employees can make their own decisions and where top-down rules and policies are implemented only to direct strategic boundaries.

This need is even more apparent in an era when technologies are changing rapidly and industry boundaries are becoming increasingly blurred. In such environments, firms need employees with the flexibility to integrate novel insights and to improve the firm's existing practices. Managers should consider how integration between exploratory and exploitative activities might be reinforced. This requires firms to develop functional flexibility, specifically employee skill flexibility and employee empowerment in their way of working to keep pace with environmental dynamism. Although strategic skill flexibility is particularly beneficial for firms in highly dynamic environments, these dynamic environmental conditions may make it more difficult for firms to empower employees and the costs of coordination may rise.

Even if managers decide to focus on both strategic skill flexibility and employee empowerment, they must understand that balancing exploratory and exploitative innovation

might still create tensions, due to resource trade-offs, inconsistent routines and potential conflicts between different areas of innovation activity. In particular, our results suggest that, in order to invest carefully and consistently in developing their employees' skills, motivation and opportunities, managers need to be aware of the challenges facing the firm, both currently and in the future. Individual-level activities such as strategic skill flexibility and employee empowerment, therefore, need to be set high on the agenda in firms.

3.5.3. Limitations and opportunities for future research

Although this research provides various managerial and theoretical insights, it nevertheless has a few limitations that propose areas for future studies. First, when studying the micro-foundations of organizational ambidexterity, we focused on functional flexibility in terms of strategic skill flexibility and employee empowerment. While both are important micro-foundations of innovation, future research could examine several other micro-level antecedents of organizational ambidexterity. For instance, the leadership style of top management teams or specific attributes of individuals can also serve as important micro-foundations of organizational ambidexterity (Yitzhack et al., 2015; Jansen et al., 2009).

Second, although we have made a useful methodological contribution by using a large-scale survey where we collected longitudinal data in an interesting context in a single region, we conclude that conducting a similar study, but in different contexts and with a longer time span, would help to provide further verification of our findings. For instance, future research could explore how employee empowerment affects strategic skill flexibility, as our study did not examine this particular causal relationship. Future studies might also reveal other factors (e.g., decentralization or formalization) that moderate the relationship between micro-level activities and organizational ambidexterity.

Third, this study implies that achieving organizational ambidexterity leads to greatest returns for firms. However, firms may use temporal separation to reconcile conflicting tensions between exploratory and exploitative innovation. Firms might focus on exploitative innovation in one period of time, and on exploratory innovation in another period of time (Gupta et al., 2006). Future studies could, therefore, examine the longitudinal and temporal separation of exploitation and exploration within firms.

Fourth, while we used Colman's (1990) bathtub model in our study, we could not entirely account for multi-level reasoning when examining the micro–macro relationships, as we did not collect separate data at the organizational and individual levels of analysis. This issue can be addressed in future studies by conducting multilevel research on organizational

ambidexterity, using two separate surveys where one addresses the individual level and another one the organizational level.

This paper provides a connection between the literature on micro-foundations and the literature on organizational ambidexterity as we try to clarify and understand how micro-level activities allow firms to reach a proper balance between exploitative and exploratory innovation activities in dynamic environments. Future longitudinal research is required to further investigate how micro-macro relations in the field of organizational ambidexterity are developed and impacted over time.

3.6. Appendix: Measures and items[a]

Exploitative innovation (Jansen et al., 2006)
1. Our firm improves existing products and services for the market
2. Our firm enlarges the current products and services for existing customers
3. Our firm frequently implements minor alterations to existing services and products
4. Our firm regularly refines the provision of existing services and products

Exploratory innovation (Jansen et al., 2006)
1. Our firm develops new services and products
2. Our firm regularly searches for new opportunities to explore new markets
3. Our firm frequently utilizes novel distribution channels
4. Our firm acknowledges needs that go beyond existing services and products

Strategic skill flexibility (Bhattacharya et al., 2005)
1. The employees in my firm have the ability to put new skills to use in a short period of time
2. The employees in my firm can shift easily to different jobs in our firm
3. Our firm employs persons with a wide-ranging variety of skills
4. In our firm people can acquire new skills in a short period of time
5. Our employees have numerous skills that are utilized in different jobs
6. In our firm it is easy to change employees to various jobs in a short period of time
7. Our firm is able to meet the request of new skills by shifting or reskilling employees

Employee empowerment (Spreitzer, 1995)
1. Employees have control over what happens in their firm
2. Employees determine the priorities of their tasks
3. Employees make numerous decisions together with others in the firm
4. Managers help to understand how the objectives of employees relate to those of the firm
5. Managers believe that their employees can handle demanding tasks
6. Managers are confident about the ability of employees to do their jobs
7. Work activities of employees are personally meaningful to them
8. Employees in my firm have a great deal of autonomy in determining how they perform their job
9. Employees can decide on their own how to perform their work
10. Employees get the freedom and opportunity in how they perform their job
11. The influence of managers on what occurs in my firm is large
12. Having some degree of power and discretion is an important part of our organization

Environmental dynamism (Volberda & Van Bruggen 1997)
1. Continuous changes are taking place in our market
2. In one year from now, nothing would be different in our market
3. The changes in our market are powerful
4. The demand of services and products constantly change in our market
5. Our consumers frequently request novel services or products

[a] *This study makes use of a 7-point scale to measure the items (1 = strongly disagree, 7 = strongly agree)*

Chapter 4.

Study III: Breaking the mold! How hybrid partnerships attain institutional change while adopting paradoxical frames.

Hybrid partnerships that engage directly in both social and commercial objectives face the particular challenge of mobilizing social activists as well as commercial actors, who adhere to seemingly incompatible logics. The question of how actors in hybrid partnerships try to deal with this 'incompatibility' to attain institutional change has mainly remained unconsidered. In a three-year case study of two regional hybrid partnerships, we study different symbolic and substantive actions performed by members of these partnerships in a multi-level process model across micro-, field-, and societal levels over time. The actions performed across these different levels of analysis are interlinked and eventually result in institutional change in HR policies at the societal level. We demonstrate that embracing the tensions around logic incompatibility enables hybrid partnerships to attain two different interrelated states of institutional change: emergent and planned institutional change. This paradoxical perception enhances the ability of individuals to integrate contradictions of the seemingly incompatible logics, which increases the possibility of planned institutional change. We discuss the theoretical implications and open up avenues for future research.

Keywords: hybrid partnerships, institutional change, paradoxical frames, substantive actions, symbolic actions.

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4.1. Introduction to study III

Addressing extensive social and ecological problems oftentimes requires the emergence of collective endeavors that have been referred to as hybrid partnerships (Smith & Besharov, 2019; Gray & Purdy, 2018; George et al., 2016). These partnerships often adhere to both social and commercial objectives, which may constitute institutional logics that are oftentimes not compatible (Besharov & Smith, 2014; Greenwood et al., 2011). On the one hand, these partnerships must address the commercial objectives that adhere to a commercial logic, such as financial performance (Pache & Santos, 2013). On the other hand, hybrid partnerships are exposed to social objectives that adhere to a community logic, such as social impact (Battilana et al., 2015). If hybrid partnerships are to attain institutional change, they must, therefore, manage the divergent objectives of these seemingly incompatible institutional logics (Pache & Santos, 2013).

Despite the expanding literature exploring hybrid partnerships (e.g. Clarke & MacDonald, 2019; Gray & Purdy, 2018; George et al., 2016; Manning & Roessler, 2014), we still know little about how hybrid partnerships deal with diverging objectives over time. Scholars have acknowledged that dealing with divergent objectives is a multi-faceted and long-lasting process that requires continuous adaptation and change (Smith & Besharov, 2019) in terms of different actions performed (Pache & Santos, 2013). Only a few studies examine how hybrid partnerships go through this process (e.g. Clarke & Crane, 2018; Gray et al., 2015), and these studies hardly clarify how members of hybrid partnerships deal with the seemingly incompatible logics over time and what consequences that can have on the institutional environment. For instance, Clarke & Crane (2018, p. 311) call for more "longitudinal studies on how actors' interactions in collective endeavors govern institutional change." In response to this void in the literature, the following research question is addressed in this study: *How can actors in hybrid partnerships that have to deal with divergent institutional logics attain institutional change?*

This research question is examined by performing a longitudinal exploratory multiple-case study of two hybrid partnerships in The Netherlands. Data was collected from archival work, fieldwork and 59 in-person interviews conducted between 2016 and 2019. We study the various symbolic and substantive actions taken by members of the hybrid partnerships in a multi-level process model across micro-, field-, and societal levels over time. Our results show that hybrid partnerships reinforce symbolic actions to align with social actors first, which are only later combined with substantive actions to motivate alignment with commercial actors. We also

demonstrate that collective action could result in emergent and planned institutional change. If members of hybrid partnerships are able to interpret divergent social and commercial objectives as paradoxical – that is, as contradictory but interrelated rather than as incompatible – these partnerships are able to attain planned institutional change over time. If the members interpret social and commercial objectives as incompatible, they might be able to attain emergent institutional change but are considerably less likely to attain planned institutional change.

Our contributions to the literature are twofold. First, we contribute to the institutional entrepreneurship literature (e.g. Skelcher & Smith, 2015; Maguire et al., 2004; Battilana et al., 2009), and to studies on logic incompatibility in particular (e.g., Micelotta et al., 2017; Wright & Zammuto, 2013; Tina Dacin et al., 2002) by demonstrating that accepting and embracing the tensions around logic incompatibility enables hybrid partnerships to attain emergent and planned institutional change. This paradox perspective (Jay, 2013; Clarke & MacDonald, 2019) on logic incompatibility brings new insights into the differences between the two different interrelated states of institutional change. Second, we add to studies on hybrid partnerships and multi-stakeholder collaboration (e.g., Klitsie et al., 2018; Manning & Roessler, 2014; Micelotta et al., 2017; Wright & Zammuto, 2013; Gray et al., 2015; Koschmann et al., 2012) by shedding light on the different symbolic and substantive actions taken by members of the hybrid partnerships in a multi-level process model over time. The model demonstrates the different actions that occur at various levels of analysis (micro-, field- and societal levels) and in three different phases (formation, adolescent growth and maturity) of the hybrid partnership evolution over three subsequent years.

4.2. Theoretical background

4.2.1. Hybrid partnerships and the reconciliation of divergent logics

Organizations operating in different sectors are increasingly engaging in cross-sector collaborations (Smith & Besharov, 2019; George et al., 2016) to tackle society's most complex issues and "wicked problems" (Klitsie et al., 2018, p. 403). The nature of these problems often asks for multi-actor collaboration across sectors (Koschmann et al., 2012). Organizations oftentimes enter into cross-sector collaborations to share information (Manning & Roessler, 2014), to combine resources (Selsky & Parker, 2005) and to solve problems mutually (Klitsie

et al., 2018). Cross-sector partnerships are formed in situations where the activities of multiple organizations are truly interdependent (Gray & Purdy, 2018). These kinds of partnerships have been denoted as hybrid partnerships (Greenwood et al., 2011; Battilana & Dorado, 2010).

Cooperation between the different entities involved in hybrid partnerships can be challenging, due to the multitude of logics involved and the participation of a variety of actors (Purdy & Gray, 2009). The actors that comprise a hybrid partnership bring with them differing goals and means, indicating that numerous institutional logics are generally present simultaneously within a hybrid partnership (Greenwood et al., 2011; Kraatz & Block, 2008). Institutional logics are "socially constructed historically pattern of assumptions, rules, beliefs and values, which direct and restrict individuals and organizations within a particular environment" (Thornton & Ocasio, 1999, p. 804). By performing a diverse set of activities that are drawn from different logics, hybrid partnerships try to reconcile divergent logics (Battilana & Dorado, 2010; Greenwood et al., 2011; Lounsbury, 2007). For example, Tracey and Phillips (2011) showed how two social entrepreneurs created a hybrid partnership that combined the logics of charity and commercial retail in order to address the societal problem of homelessness more effectively. In the same way, Battilana and Dorado (2010) demonstrated how commercial organizations in Bolivia combined the development and banking logics to fight poverty.

The multiple logics that constitute an institutional environment may not be only divergent, but also incompatible (Greenwood et al., 2011; Lounsbury, 2007). Logic incompatibility may arise as a result of differences between the objectives associated with distinct logics (Pache & Santos, 2013). This is because "objectives reflect core values and beliefs and are evaluated based on a logic of appropriateness, making them hard to challenge or modify" (Besharov & Smith, 2014, p. 367). Logic incompatibility can also persist because the means specified by a logic are linked to resource commitments and path dependencies that prevent change (Pache & Santos, 2013). These issues make hybrid partnerships vulnerable to derailment – or even dissolution – and exceedingly complex to manage.

Smith and Besharov (2019) recently suggested that, in order to facilitate the integration of tensions between various aspects within the organization, organizations should perceive the tensions as paradoxical – that is, as contradictory yet interrelated. According to Ocasio & Radoynovska (2016, p. 293), the notion of paradox can be used at different levels of analysis and denotes "components or aspects that appear to be reasonable in separation but rather illogical when acting together". When embracing paradoxicality, one thus recognizes the tension that might exist among divergent components or aspects, but realizes that trying to combine them leads to new solutions (e.g. Smith & Besharov, 2019; Ocasio & Radovnovska,

2016; Slawinski & Bansal, 2012). In this study, we, therefore, adopt a paradoxical lens that may help to make sense of the tensions that can arise within hybrid partnerships and may also assist in dealing with trade-offs associated with divergent logics.

4.2.2. Hybrid partnerships as carriers of institutional change

Institutional change has been approached in two different ways in the literature, each emphasizing a difference in the foundation and structure of change. In the first approach, institutional change is described as emerging from "exogenous shocks stemming from the external environment which can influence stable institutional environments" (Clemens & Cook, 1999, p. 447). A second approach of change, which we embrace in this paper, emphasizes the role of organizational-level factors, called endogenous factors such as power forces, discourses and organizational cultural codes to constitute change (Lounsbury, 2007; Maguire & Hardy, 2009). This approach denotes the role and value of individual actors as well as group processes, that is, why and how groups of actors like hybrid partnerships engage in change initiatives (Upham et al., 2018; Clayton et al., 2015). Table 4.1 presents an overview of the literature on these two different approaches towards institutional change.

Table 4.1. A review of existing literature on institutional change

Triggers of inst. change	Description	Scholars
Exogenous triggers of institutional change	Institutional changes as arising from exogenous disturbances in the institutional context to which actors and organizations responded. Top-down driven change.	Meyer, (1982); Clemens & Cook, (1999)
	Regime-level factors Shifts in political regimes and regulatory changes.	Clark & Soulsby, (1995); Whitley & Czban, (1998)
	Sociopolitical upheavals Wars, dictatorship and revolutions that affect change.	Allemendinger & Hackman, (1996)
	Technological changes Competence destroying technological changes.	Romanelli & Tushman, (1994)
	Competition Crashing competitive pressure and resource scarcity.	Thornton & Ocasio, (1999)
Endogenous triggers of institutional change	Change that is precipitated by the purposeful collaborative efforts of powerful actors to attain institutional change. Bottom-up driven change.	Lounsbury, 2007; Maguire & Hardy, 2009
	Collaborative leadership Transformational vs. transactional leadership styles in the initiating and implementation of institutional change.	Hamner et al. (2008); Lang et al. (2018)
	Collaborative entrepreneurship Groups of actors leverage competing institutional logics to spearhead change.	Skelcher & Smith, (2015); Lang et al. (2018)
	Group awareness and ability Self-awareness and the ability to diagnose challenges and problems within groups of organizations.	Lang et al. (2018); Compagni et al. (2015)
	Process design Design of organizations that includes sequencing various actions and structures to create change.	Hassenforder et al. (2015); Pereverza & Kordas, (2017).

The role of the individual actor and groups of actors such as hybrid partnerships in constituting change is embedded in the institutional entrepreneurship literature (e.g., Maguire et al., 2004; Skelcher & Smith, 2015; Battilana et al., 2009), which postulates that actors deliberately leverage divergent institutional logics to establish change (Garud et al., 2002). Efforts to modify or replace institutional logics are considered to be "acts of institutional entrepreneurship" (Maguire et al., 2004, p. 658).

To qualify as institutional entrepreneurs, actors embedded within hybrid partnerships should break with current institutional structures and rules in order to champion and advocate new structures, norms and rules (Battilana et al., 2009). Like entrepreneurs who create

opportunities by looking for economic and political discontinuities, institutional entrepreneurs create opportunities by searching for cultural discontinuities (Maguire et al., 2004). The institutional entrepreneur is aware of the modularity of cultural aspects within a particular sector or region and experiments with how these aspects can be recombined in hybrid ways (Greenwood & Suddaby, 2006; Tracey et al., 2011). Accordingly, institutional entrepreneurs can be regarded as the engines of institutional change.

Whereas most scholars in the field of institutional entrepreneurship have studied one or a small number of actors in order to constitute institutional change (e.g. Maguire et al., 2004; Mutch, 2007), various studies have lately suggested that collective action is required to constitute change initiatives. These studies emphasize that actors with diverse backgrounds, concerns, resources and objectives jointly work towards achieving institutional change (Meyer & Höllerer, 2014; Lawrence et al., 2013; Battilana & Dorado, 2010). This collective action is referred to as collective institutional entrepreneurship, a concept that is defined as "achieving sustained collaboration among numerous dispersed actors to create new institutions or transform existing ones." (Wijen & Ansari, 2007, p. 1079). It is the plurality of institutional entrepreneurship and its growing importance within institutional environments (Skelcher & Smith, 2015) that makes this literature stream highly relevant to the study of hybrid partnerships and institutional change.

4.2.3. The evolution of hybrid partnerships in attaining institutional change

To develop our process model of how hybrid partnerships attain institutional change, we build on prior literature that has examined the evolution of hybrid partnerships (e.g., Koschmann et al., 2012; Selsky & Parker, 2005; Gray & Purdy, 2018; Laland et al., 2014). Research on hybrid partnerships oftentimes includes the studying of a single or several phases of the hybrid partnership life cycle – that is, formation, adolescent growth and maturity. Clarke & MacDonald (2019) studied the formation phase of four Canadian sustainability plans and found that the outcomes of hybrid partnerships could be regarded as resources that actors gain from participating in the partnerships. Klitsie et al. (2018) took a framing approach to describe the process by which hybrid partnerships are sustained. They conclude that collaborations move towards optimal frame plurality, which constitutes an continuing balancing act directed at fostering larger conjunction between different actors about extremely complex issues. In their study of a US-based hybrid partnership directed at waste management, Turcotte and Pasquero (2001) found that throughout its lifecycle, the partnership failed to accomplish its primary objective, which was to create a plan for environmental waste management. In line with these

studies, we build on the prior evolutionary literature stream (Laland et al., 2014; Volberda & Lewin, 2003; Selsky & Parker, 2005) to develop a process model of how hybrid partnerships that have to deal with divergent institutional logics can attain institutional change.

In sum, this study seeks to build upon the literature on hybrid partnerships, logic incompatibility and institutional entrepreneurship to develop a multi-level process model of how hybrid partnerships can attain institutional change over time.

4.3. Methods

We conducted a longitudinal exploratory multiple-case study (Yin, 2013; Eisenhardt, 1989) of two pioneering hybrid partnerships in the Rotterdam port region – Europe's largest and most important port region. The hybrid partnerships are respectively called "Rotterdam Works" (hereinafter referred to as RWORKS) and "Rotterdam Initiative for Social Innovation (hereinafter referred to as RISI)". Both partnerships try to create a flexible workforce with a focus on implementing sustainable employability policies in the Rotterdam port region. Three criteria guided the decision to study these two hybrid partnerships. First, both partnerships were introduced by one highly active actor in the region and tried to create both social and commercial impact in the region in the field of HR. Second, both partnerships were established relatively recently (in 2016) and the researchers could witness the establishment and further developments of both partnerships at first hand. This unique position made it possible to gather plentiful and highly valuable data. Third, the comprehensive hybrid form of collaboration is considerably unique and new to the relatively traditional Rotterdam port region, which formerly criticized cooperation due to fierce competition in the port, the interference of labor unions and the eagerness of organizations to solve problems individually. These three criteria created several opportunities to study hybrid partnerships in a particular region.

4.3.1. Research context

The Rotterdam port region is considered to be the largest port and industrial region of Europe and employs 180.000 people. Low-skilled dockworkers have dominated the region since 1872 (Port of Rotterdam Authority, 2019). The first dockworkers were portrayed as rough and hardworking people who arranged everything themselves. The following statement by former dockworker Hein Mol in the 1900s clearly reflects this. "Dockworkers were difficult to regulate. They formed a broad, undeveloped, indifferent, fancy mass, who could start moving

quickly and spontaneously". The dockworkers became elusive for traditional trade unions and gave rise to labor unions, which have been very powerful and influential within the region up until today. The long history of strikes and protests has eventually resulted in good working conditions for the dockworkers.

Recently, developments such as digitalization, automatization and the proliferation of renewable energy have profoundly impacted the nature of the work of traditional dockworkers. In the backdrop of these developments and the derived necessity to create a flexible regional workforce that is 'fit for the future', RWORKS and RISI were established. These regional hybrid partnerships were both initiated in an effort to move from a traditional focus on strict job security policies, which had been in place in the region for a long time, towards a focus on sustainable employability policies. Job security is about the extent to which a person will keep his/her job. In contrast, sustainable employability is about the extent to which employees can work in a productive, motivated and healthy way, but not necessarily at the same employer. Sustainable employability is an important policy to guarantee long term employment as it enhances the certainty to find work and to develop oneself in the labor market over time.

RISI and RWORKS operate in a highly fragmented and pluralistic region that is characterized by the longstanding coexistence of multiple demands exerted by actors adhering to either the social or commercial logic. The community logic (Battilana et al., 2015), which involves actors such as labor unions, public bodies and employment offices, require hybrid partnerships to benefit the community by focusing on employee wellbeing. Conversely, actors like trade unions, commercial organizations and private investors require hybrid partnerships to address production efficiency and market orientation, as prescribed by the commercial logic (Pache & Santos, 2013). For this reason, both RWORKS and RISI had to deal with the multiple and fragmented objectives of social and commercial actors. Table 4.2 presents a comparison of the commercial and community logics that are present within both RWORKS and RISI.

4.3.2. Data sources

Data was gathered in a variety of different ways including semi-structured interviews, participant observation during both formal meetings and informal conversations, formal documents, e-mails and other secondary data sources. We investigated the development of both partnerships from their preliminary phases for the subsequent three years. A detailed overview of the data collected is presented in Table 4.3.

Table 4.2. Comparison of the commercial and community logics that are present within both RWORKS and RISI

Characteristics	**Commercial logic**	**Community logic**
Economic system	For profit	Not-for-profit
Value orientation	Cost-saving	Social-welfare enhancing
Primary source of legitimacy	Pragmatic	Moral
Goal achievement	Be profitable by enhancing employee productivity and efficiency.	Address social issues by focusing on employee engagement and wellbeing.
Basis of attention	Develop and maintain financial employee success.	Develop and maintain employee fairness and justice.
Governance mechanism	Hierarchical control	Democratic control
Relevant external actors	Trade unions, commercial organizations, private investors and shareholders.	Public bodies, donors, social organizations, labor unions, social services and employment offices.
External actor objectives	Price competition, customer satisfaction and production efficiency.	Fulfilment of social mission, employee wellbeing and personal development.
Source of legitimacy	Capacity to compete in the market	Contribution to addressing societal issues.

Table 4.3. Data sources (including details on informants)

Data	RISI	RWORKS
Interviews	***Total number*: 31** fully recorded, fully transcribed. *Average length*: 90 minutes *Informants by organization in 2017:* **Labor union:** 2 labor collaborators, 1 chairman. **Trade union:** 1 managing director, 1 chairman, 1 labor advisor. **Municipality**: 1 innovation officer, 2 HR advisors. **Organizations**: 4 HR managers, 3 innovation managers. *In 2018 the same informants were interviewed, except for 1 HR advisor at the municipality who changed jobs.*	***Total number*: 28** fully recorded, fully transcribed. *Average length*: 90 minutes *Informants by organization in 2017:* **Municipality**: 1 innovation officer, 2 HR advisors, 1 HR project leader. **Employment agency**: 1 project leader **Labor union**: 1 negotiator **Organizations**: 3 HR managers, 2 innovation managers, 3 recruiters. *In 2018 the same informants were interviewed.*
Participant observation	***Total number:* 36** *Timespan:* 2017 - 2019 *Type of participated events:* 16 round tables 9 steering committee meetings 4 project group meetings 3 informal gatherings 2 public events 2 skype calls	***Total number:* 39** *Timespan:* 2017 - 2019 *Type of participated events:* 12 meetings of partner organizations 9 recruiter group meetings 9 phone calls 8 informal gatherings 1 public event
Secondary data	***Total number*: 440** official documents and press articles. *Timespan*: 2016-2019 250 email conversations 85 additional documents 60 WhatsApp messages 20 pictures taken 10 press articles 8 documents posted on websites 3 documents on generating strategy 2 promotional videos 1 Project plan document 1 Signed letter of commitment	***Total number*: 395** official documents and press articles. *Timespan*: 2016-2019 210 email conversations 95 additional documents 43 WhatsApp messages 35 pictures taken 5 advertisements 3 documents on generating strategy 2 promotion videos 1 document with a common set of rules and regulations 1 shared LinkedIn page

4.3.3. Interviews

A first round of semi-structured interviews was carried out in 2017 with 59 individuals, including CEOs, directors, managers, government officials, labor union negotiators, project leaders, dockworkers and other individuals that were related to RISI and in RWORKS. These interviews were conducted just after the formation of both partnerships. Questions were asked about the aims, missions and visions of the actors involved. Another round of semi-structured interviews was conducted in 2018 with the same (except one) 59 individuals related to RISI and RWORKS. These interviews focused on the development of the multi-partner collaborations, the roles of individuals and their views on the challenges and successes of the collaborations. We designed an interview template that allowed us to prompt on critical issues as identified from the literature.

4.3.4. Participant observation

We also collected data from participant observation at various meetings and occasions of both partnerships. This involved attending initial informal gatherings (mainly in the preliminary phase), formal meetings of the steering committees and project group meetings, as well as phone and skype calls, kick-off events and other events. Field notes and pictures were taken to document the findings of the observations.

4.3.5. Secondary data sources

Nearly all documentation related to the two partnerships was collected and reviewed. This included more than 800 documents on generating a strategy, the partnerships' initiation documents, press articles, documents posted on websites, promotion videos, pictures, a signed letter of commitment and project plans. Furthermore, more than 450 e-mail messages containing strategic discussions and interactions about challenges and other important matters regarding both partnerships were carefully analyzed. The documentation was analyzed to build a chronological description of the cases and to supplement data from interviews and observations (Yin, 2013).

4.3.6. Data analysis

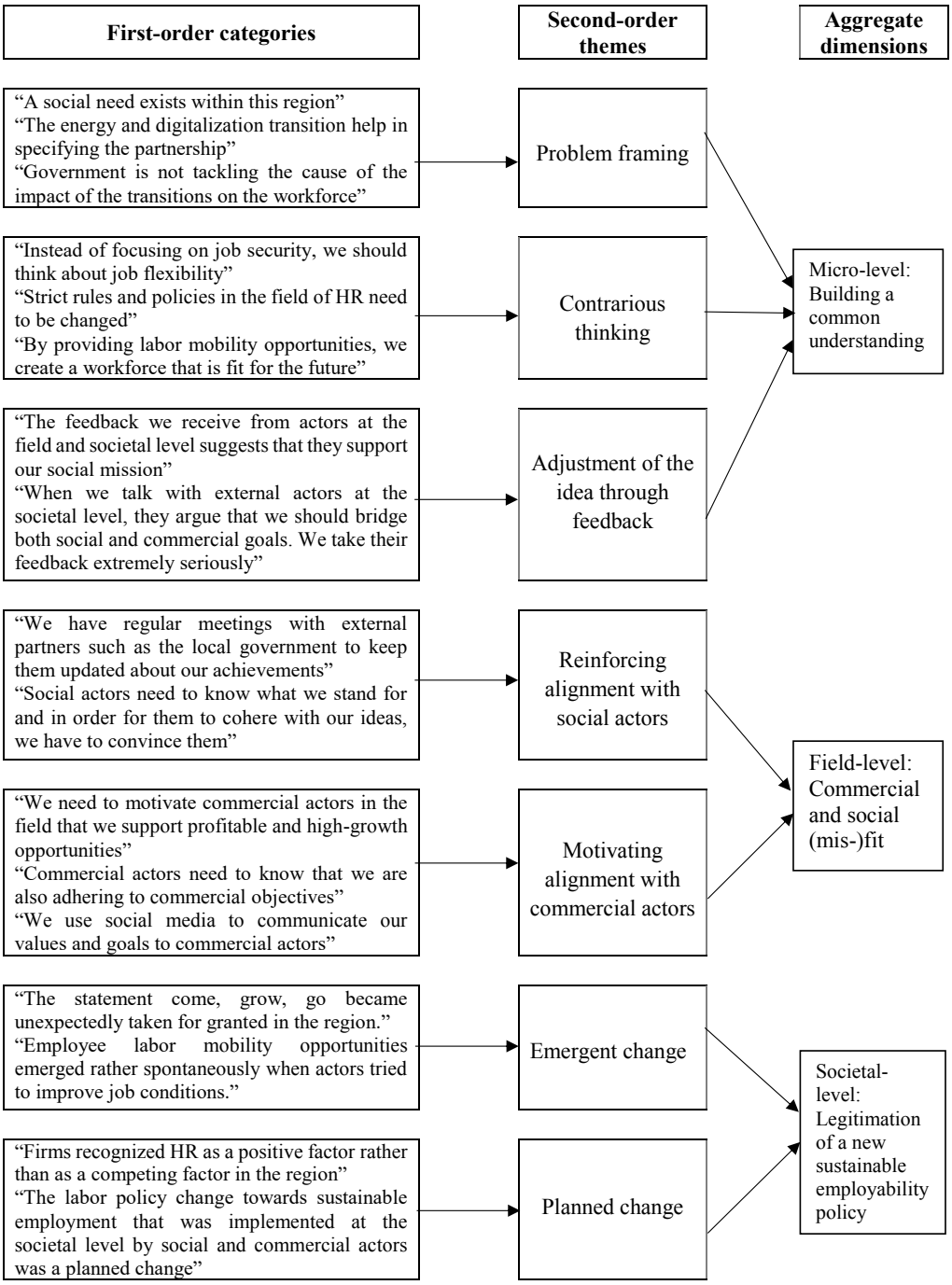
The data was analyzed inductively by means of an in-depth comparative case study (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). This analysis involved three stages in order to get an understanding of all the data that was collected (Corbin & Strauss, 1990). In the first stage, we carried out a within-case analysis where case profiles were developed by using

ATLAS.Ti. This software tool helped in the systematic arrangement of interview transcripts, observation notes, audio passages and archival data. We grouped the information to identify emergent themes in the interviewees' comments (Yin, 2013).

In the second stage, we utilized the constant comparative method (Gioia et al., 2013; Glaser & Strauss, 1967) in order to uncover differences and commonalities in the studied cases. We used axial coding and open coding (Yin, 2013) to code our data. Open coding was used to analyze the real words and language utilized by the informants. The open codes were grouped into first-order concepts. Afterwards, axial coding was used to identify relations among the first-order concepts found in our data and the theoretical perspectives found in the literature. This eventually lead to the formulation of second-order themes (Gioia et al., 2013). This was a continuous process that involved examining and revising the participant observations and interviews thoughtfully, by drawing on theoretical concepts found in the literature. This process was continued until the patterns were arranged into the final aggregate dimensions, resulting in theory-building and conceptualization (Eisenhardt, 1989).

In the third stage, we verified the initial results obtained from the participant observations, interviews and secondary-data sources of RISI and RWORKS. This important stage helped to ensure that no important other views on issues related to RISI and RWORKS were forgotten in our analysis. Following Gioia et al. (2013), we presented the findings of this study by categorizing them into first-order categories (those closer to the data), second-order themes (those closer to the literature) and final aggregate dimensions, as presented in Figure 4.1.

Figure 4.1. Data structure



The analysis of institutional change in this study concentrated on the extent to which both hybrid partnerships created new policies that were spread and taken for granted outside the partnerships. We differentiated between emergent and planned institutional change. Emergent institutional change is unpredictable, often unintentional and unfolds in a spontaneous and unplanned way (Weick & Quinn, 1999). Planned institutional change, in contrast, involves planned steps for altering societal behavior (Burns, 2006). Table 4.4 presents a comparison of the hybrid partnerships RISI and RWORKS.

Table 4.4. Comparison of two hybrid partnerships: RISI and RWORKS[a]

Partnership characteristics	**RISI**	**RWORKS**
Year of foundation	Q1 2017	Q3 2016
Formal existence	2 years	2.5 years
Goals	To co-create on regional social innovation activities and to enhance the usage of knowledge between organizations.	To create voluntary labor mobility opportunities for employees in the Rotterdam port region.
Initiator	BLUE – Manager at Port of Rotterdam Authority.	PURPLE – Director at Port of Rotterdam Authority.
Number of participants Q3 2019	7 participating organizations.	15 participating organizations.
Participating organizations Q3 2019	Mainly social firms, certain commercial firms, educational institutes, the local government, trade union, labor union, a consulting firm and the Port of Rotterdam Authority.	Social and commercial firms, educational institutes, the national government and the Port of Rotterdam Authority.
Governance	A steering committee consisting of three actors (the first actors that joined the reform). The steering committee is in charge of important decisions. A project leader was assigned to manage RISI, a consulting firm coordinates actions and a financial controller controls finances.	One partner group consisting of HR managers and HR professionals. One recruiter group consisting of recruiters. The partner group controls the recruiter group.
Formality	A formal (signed formal documents to specify expectations). A formal established document called "RISI project plan."	Semi-formal (no signed formal document, nor a letter of intent). Formal established document called "rules of the game."
Communication	Regular formal meetings, frequent email exchange and occasional phone call conversations.	Regular formal meetings, occasional email exchange and phone call conversations.

[a] *This table is based on our observations and secondary data.*

We analyzed and coded all actions initiated by the two partnerships that were aimed at attaining institutional change. We differentiated between substantive and symbolic actions. "Substantive actions are those performed for their intrinsic value, with the main purpose of having a tangible impact on goals and processes" (Ashforth & Gibbs, 1990, P. 178). "Symbolic actions are those performed to impress the target audience by transferring a socially constructed meaning that surpasses the intrinsic value of the action" (Ashforth & Gibbs, 1990, P. 180). After coding the actions performed by RISI and RWORKS, we ordered them chronologically and, in line with prior studies (e.g. Koschmann et al., 2012; Selsky & Parker, 2005), we categorized them into three phases: formation, adolescent growth and maturity. Figures 4.2 and 4.3 demonstrate the timeline of the main actions performed by RISI and RWORKS in attaining institutional change.

Figure 4.2. Timeline of the main actions performed by RWORKS

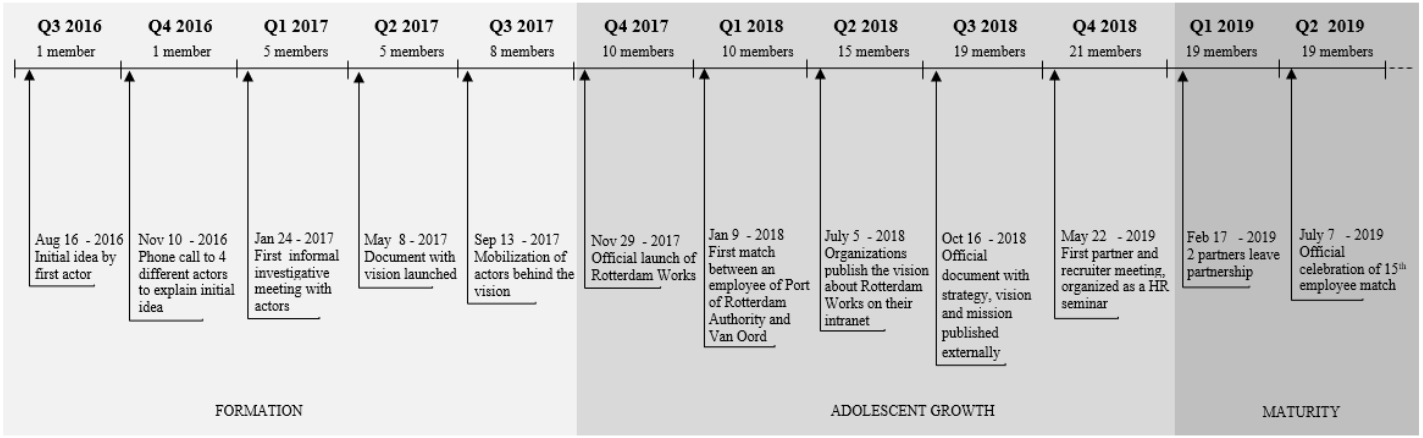
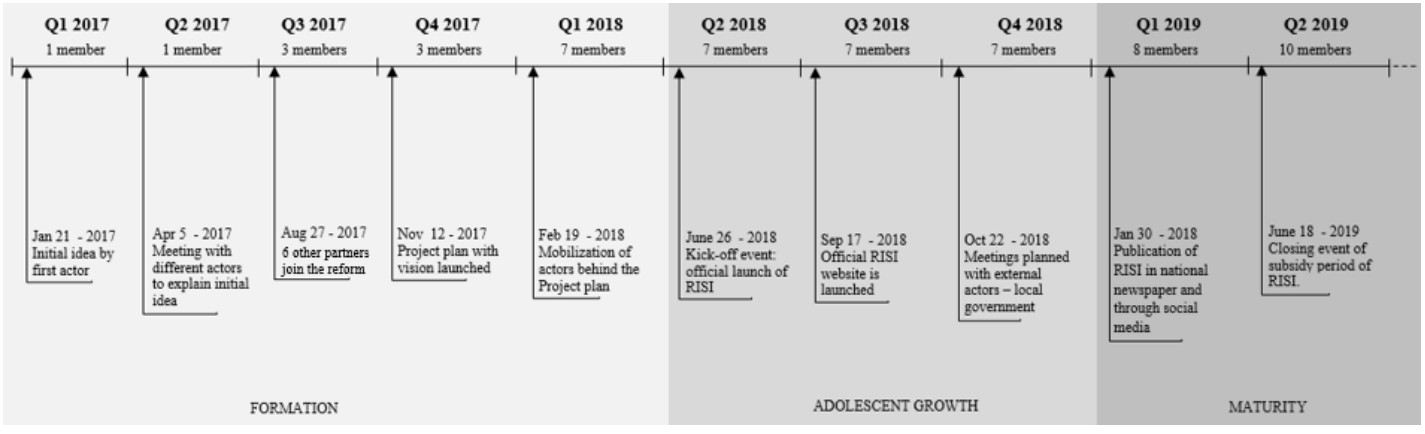


Figure 4.3. Timeline of the main actions performed by RISI



4.4. Findings

In this section, we start by detailing the formation (phase 1) of the two hybrid partnerships RWORKS and RISI. Subsequently, we elaborate on how they initially attained emergent institutional change (phase 2) and eventually went on to attain (or not to attain) planned institutional change (phase 3).

4.4.1. Phase 1: Formation of a group of reformers through reinforcing symbolic actions

Rapid technological innovations that can have major impact on employment in the Rotterdam port region present new challenges to the Port of Rotterdam Authority. The presence of sufficiently qualified employees is an essential condition for the competitive advantage of the port. Besides, the Port of Rotterdam Authority is aware that work and prosperity contribute to the social value of the port. Especially two individuals, which are a director (hereinafter referred to as PURPLE) and a manager (hereinafter referred to as BLUE) operating at the HR department of the Port of Rotterdam Authority, have tried to make a substantial impact to the field of HR in the region, by optimizing the deployment of people in the port.

In mid-2016, PURPLE and BLUE were seeking a solution to a problem numerous dockworkers were increasingly facing: social and environmental changes were radically changing the nature of their work. These changes require adaptations in the way organizations and employees work. One significant challenge for the Rotterdam port region has therefore been to prepare the workforce in this region for new types of jobs, tasks and business activities. Although this might sound like a task of the local or national government, no major initiative in this field had been launched before 2016. Aware of the risks for numerous employees in the Rotterdam port region, PURPLE aimed to create voluntary labor mobility opportunities in order to contribute to a more flexible regional workforce with a wide variety of skills and who could be redeployed more easily in a diverse set of organizations. Her pioneering idea was as follows:

> *"The usual approach to help employees is to find them a job and to invest in job security. This is exactly what labor unions have been doing for ages. However, what they forget is that if the high-tech invasion causes jobs to be lost, we cannot secure these jobs anymore. We, therefore, need to focus on employment security. I use HR jargon to specify that."*

Similarly, at the beginning of 2017, BLUE came up with an idea to set up an initiative to better prepare current employees and students in the region for future work. Sustainable employability and social innovation were the key themes of his initiative. BLUE's goal was to collaborate with a diverse set of partners on regional social innovation activities and to enhance the usage of knowledge between organizations. As collaborations in the field of social innovation were not yet available, he sought to assess the expected benefits and costs of developing such an idea. He argued:

> *"I am doing this for current and future employees in the region. I know that someone has to do it. If I was not 100% intrinsically motivated, I would not start with this reform at my current age. In fact, I could have already been retired."*

Both PURPLE and BLUE identified initial difficulties in finding allies for their ideas and they estimated that the expected benefits of a flexible workforce were possibly not sufficient to offset the development costs. It became apparent that the human resource (HR) processes and policies were highly standardized and routinized in organizations. Besides, labor unions had a significant influence on HR policies and practices in the region and most organizations did not want to intervene with the current policies set. To overcome these barriers, both BLUE and PURPLE engaged in reinforcing symbolic actions. BLUE and PURPLE reinforced their earlier activities and their networks to find allies for their ideas. For example, PURPLE used HR jargon to underline an initiative she launched together with the local government. BLUE used informal language to emphasize a successful international initiative to which he had contributed substantially. BLUE explained the following:

> *"I had several people in mind whom I wanted to call, as I worked with them on projects in the past. However, you have to do this strategically: you need to involve both social and commercial actors from the start."*

The symbolic actions led to a formation of two parallel groups of early reformers who were convinced to change the strict labor policies in the Rotterdam region. These groups consisted of respectively six directors, including PURPLE herself (PURPLE's group) and five persons, including BLUE himself with different job positions (BLUE's group), all from different organizations in the region. The early reformers shared several distinctive features. In both groups, the reformers shared a common interest in HR, knew each other from other HR

initiatives or networks and had a similar vision of where HR was heading. They set out to "awaken" directors and policymakers in the region to the dangers of inaction and proposed a reform-program that was designed to bring HR developments to the forefront in the region.

4.4.2. Phase 2: Symbolic and substantive actions to convince social and commercial actors

After the formation of a group of reformers, these reformers tried to expand by aligning with legitimate actors in the field through symbolic actions. In mid-2017, the reformers tried to engage with social and commercial actors in the field and requested feedback from them through substantive actions. This enabled both groups of reformers to obtain detailed information about the short-term and long-term expectations of both social and commercial actors. It became evident that they wanted both groups of reformers to become more efficient and formalized with strong action plans. Based on this enhanced understanding of the expectations of the relevant social and commercial actors, the reform groups became convinced that the next step was to show more visible signals of formalization and market orientation:

> *"Society perceived us as a group of reformers and we were, therefore, not taken very seriously. Then, PURPLE told us that we had to present ourselves differently. It became clear that we had to change. This was the moment that we formalized."*

In late 2017, more than one year after the pioneering idea, PURPLE and her allies officially launched RWORKS. They reinforced symbolic actions to first convince social actors of their initiative by formalizing communication channels and by creating an official LinkedIn page to spread symbols and narratives. RWORKS also invited social actors to their quarterly meetings, intending to position RWORKS as a professional, well-organized hybrid partnership, capable of addressing particular social objectives such as employee wellbeing, to benefit the community in the region.

In the same period, RWORKS attained an emergent change at the societal level: RWORKS succeeded in having a number of employment transfers between organizations. One employment transfer included a high-potential business partner of one organization transferred to another organization in the region. Besides, the statement "come, grow, go" initiated by members of RWORKS, became increasingly shared and taken for granted in the region. "Come, grow, go" means that people enter an organization (come), they develop themselves further in the organization (grow), and after a while, they may leave the organization (go). This

"go" should not necessarily be perceived as a bad thing as the person will develop himself again in the next organization. One actor involved in RWORKS argued:

> *"During several meetings, we invite government officials, labor unions, the Ministry of Social Affairs and Employment, but also employees that are working in the Rotterdam port region. They must see what we do and aim for."*

Meanwhile, BLUE and his allies reinforced symbolic actions by convincing the board of directors of the members involved to embrace their reform with the aim of creating sustainable employability policies in the region. At the same time, communication channels were formalized, symbols and narratives were spread through an official website and social actors were invited to join round table meetings. In mid-2018, the reform became an official hybrid partnership when it launched its name "Rotterdam Initiative for Social Innovation" (RISI) at an official "kick-off event" where spokespersons would give notion to the importance of the reform. In doing so, the hybrid partnership attracted the attention of social actors as it gained more visibility, exposure and legitimacy of its social impact at the societal level. This visibility and exposure to social actors, led to an emergent change at the societal level as organizations increasingly started to perceive HR as an important facet within the region. The organizations noticed that investing in HR was necessary for the wellbeing of employees and the competitive advantage and social value of the port. One spokesperson of RISI argued:

> *"It is great that our symbolic actions to convince social actors led to a spontaneous policy change within society. Maybe it helped that I sent a message to the social world: we are here and we want you to help us in our journey to create a bottom-up change in the region."*

At the end of 2018, both RWORKS and RISI had achieved emergent institutional change at the societal level by reinforcing symbolic actions to social actors at the field level. However, commercial actor objectives were not fully met. Both RWORKS and RISI intended to also align with commercial actor objectives, but did so with varying results.

RWORKS received feedback from actors at the field level suggesting that they acknowledged and supported RWORKS' social mission not only because it enabled the Rotterdam port region to address the social objectives of the social actors, but also, paradoxically, because in the long term it could reinforce labor efficiency and cost reduction,

which were the objectives of the commercial actors. In this way, substantive actions such as the establishment of a formal document called "rules of the game" and the creation of a formal incentive system were reinforced to motivate commercial actors. One manager argued:

> *"When we talk with external actors at the field level, they argue that we should bridge both social and commercial goals. We take their feedback extremely seriously, in order to eventually realize planned institutional change."*

While more social and commercial actors became involved in RWORKS, there was a growing skepticism among actors within the partnerships. For instance, actors ventilated different stories to the field. As a result, actors entered the partnership with diverging ideas. RWORKS noticed that the time had come to reinforce substantive actions to solve internal problems and to show commitment to combine social and commercial objectives more explicitly. Considerable attention was, therefore, devoted to trust, stability and internal communication into building a common understanding. One partner in RWORKS argued:

> *"Over time, we came to a phase in which there were diverging ideas about the existence of our partnership, its vision and goals. The initial idea had kind of vanished and we really had to come together and clarify: this is our strategy."*

In RISI's case, actors at the field level saw the substantive and symbolic actions of the partnership but assessed them antithetically. The social actors such as local regulators, employment organizations and the labor unions evaluated the symbolic actions positively, as in line with their objectives. Commercial actors such as trade unions, commercial organizations and investors, who evaluate organizations in terms of financial performance and business processes, however, assessed RISI's image of social orientation more negatively. They perceived RISI as a hybrid partnership that neglected their commercial objectives. One commercial actor argued:

> *"The problem with RISI is that they use the social dimension as the only marketing tool, but people in the field also want to see the commercial performance. RISI cannot show this."*

RISI tried to solve this issue through substantive actions to convince commercial actors in the field. For instance, RISI appointed a formal project leader, created extensive communication and strategy plans and updated their official website to ventilate a message to commercial actors. One actor within RISI stated:

> *"Let me be clear: RISI is not only a social initiative, but it is also a commercial initiative as it seeks cost reductions and enhanced labor efficiency."*

Subsequently, RISI reinforced substantive actions to enhance the internal alignment and a common understanding within the partnership by introducing weekly phone calls among members, more frequent meetings (every three weeks) and vast e-mail communications. Nevertheless, RISI was unable to resolve the diverging ideas about the partnerships' goals and vision. Despite the efforts that RISI put into convincing commercial actors, the continuing negative assessment of commercial actors further threatened their support for RISI. This almost resulted in losing its subsidy (about 200.000 euro's) from the Dutch Ministry of Social Affairs and Employment.

4.4.3. Phase 3: Social and commercial (mis-)fit through symbolic actions

At the beginning of 2019, after a revision of the common understanding within the partnership and a review of feedback by actors in the field, RWORKS began to deploy symbolic actions again intended to reinforce its efforts in the field of HR. RWORKS came to share the view that they needed to deal with their commercial and social objectives in order to avoid misfit between social and commercial actors in the field. Key actors within the partnership gave interviews in regional newspapers to explain the importance of a sustainable employability policy and to stress both the social and commercial efforts RWORKS intended to make. The partnership gained a lot of exposure by placing the narratives in the field. Members of RWORKS realized that the partnership and its objectives had to make sense to social and commercial actors in the institutional environment who were used to other systems, practices and structures. One HR manager related to RWORKS argued:

> *"Considerable effort has been put into expressing the essence of the new policy of sustainable employability underpinning our hybrid partnership that meet the needs of both social and commercial actors."*

Reassured over RWORKS' social and commercial orientation due to its symbolic actions to social actors and substantive actions to commercial actors, society now positively assessed the motivation of RWORKS to accept and work through the tensions of social and commercial objectives. One commercial actor in the field argued:

> *"What impresses me is that RWORKS is efficient and cost-oriented while also focusing on employee flexibility and wellbeing. They are very transparent at this point. I think that this is a strategy: they want society to know this."*

In the case of RISI, the reinforcement of symbolic actions was well received by social actors, who were impressed by its social commitment. However, RISI still failed to guarantee the endorsement and support of commercial actors, and instead triggered their skepticism with its actions showcasing non-conformance with their objectives. Commercial actors were still waiting for clear signals of commercial orientation:

> *"RISI is tied to the image of a social organization. Now, it forcefully tries to change this, but when it interacts with commercial partners, it suffers because of this."*

This awareness persuaded RISI to start engaging in several symbolic actions. For instance, it communicated the introduction of a commercial party to manage the partnership and it highlighted the appointment of a financial controller for the financial aspects of the partnership. These symbolic actions were meant to reinforce its image as a professional organization. However, RISI's members continued to perceive commercial and social actor objectives as incompatible. Members feared that a market-oriented image could displease social actors. At the beginning of 2019, RISI noticed that it had still not regained commercial actors' support and was, therefore, unable to attain planned institutional change.

4.4.4. The rise of a new HR policy through adopting paradoxical frames

In 2019, it became evident that RWORKS had been able to embrace paradoxical frames, where members understand that combining its opposing social and commercial objectives leads to new solutions in the field of HR. Instead, RISI was not able to ensure that its members perceive these objectives as paradoxical and elicited incompatible action tendencies that reduced their effectiveness. RWORKS had produced changes in the field of HR, which canalize the behavior of both social and commercial actors in the region. These changes include three aspects.

First of all, HR policies in the Rotterdam port region have been transformed and unified around ideas, which were controversial in the beginning of the 20th century and which are now commonly shared and taken for granted by numerous organizations in the region. The statement "come, grow, go" initiated by partners at RWORKS, is largely used in the region. The HR field has increasingly gained more recognition as an important field in the region. Second, the representation of the role of HR has changed. Society has broadly acknowledged the necessity of developing a workforce that is fit for the future.

Similarly, the actors find it important to position HR-issues as a collaborative effort rather than as a competing factor in the region. This new orientation is accepted and enacted by commercial and social actors who increasingly see employees as a source of expertise and a driving force for business success. As a result, a growing extent of employee empowerment can be observed within organizations in the Rotterdam port region. Third, a new collective agreement for labor and education has been negotiated and approved in 2019 by the municipality of Rotterdam. New rules were identified within the region where new understandings of legitimate behavior became reproduced outside the partnerships. The Rotterdam city council member of Employment and Income came to be a passionate supporter of this agreement and it ultimately shaped the fundamental standpoint of the municipality's social and economic policy. In 2019, this city council member declared:

> *"The agreement is a radical new way of offering value to the community. It does so by uniting strong business- and social needs in order to prepare businesses and the community for future employment and to create a favorable working environment for everybody."*

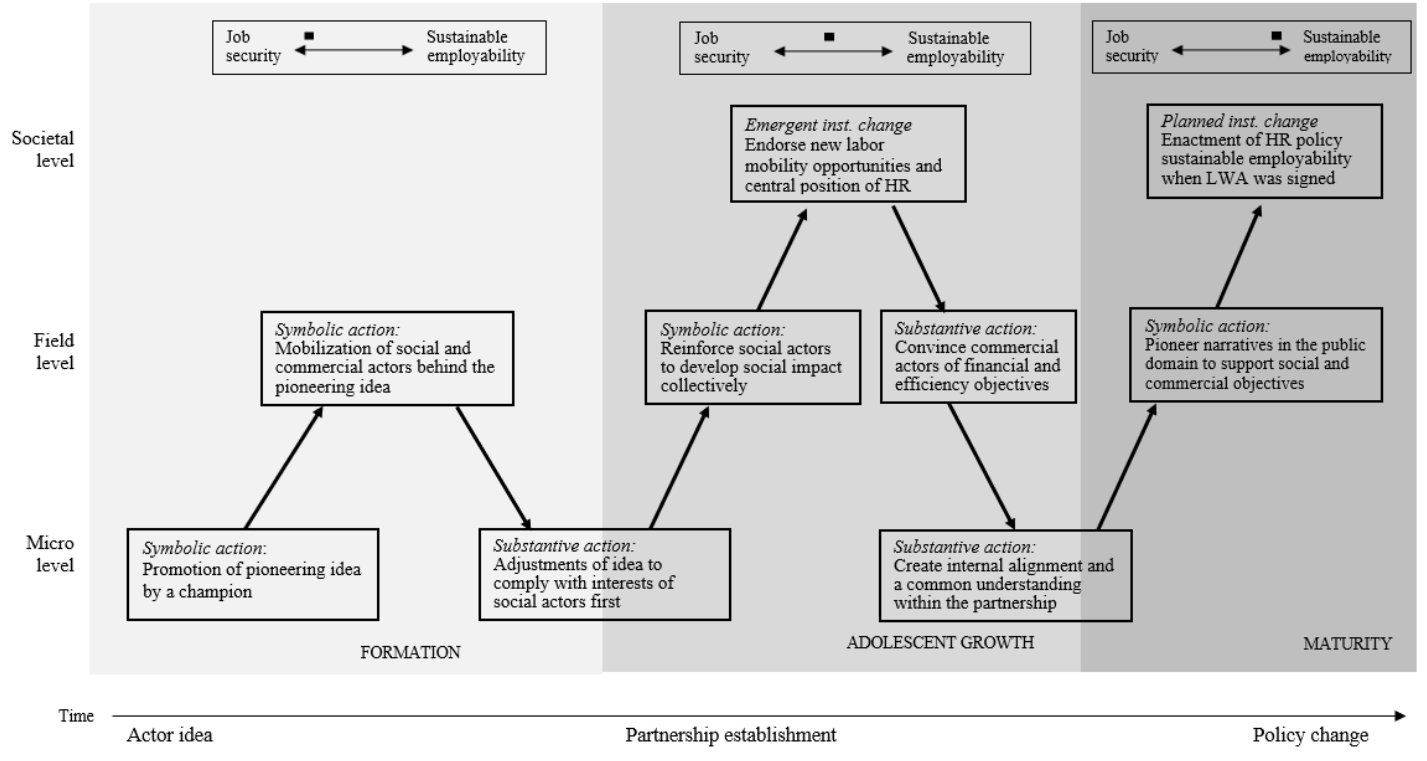
Over time, the Rotterdam port region has increasingly distanced itself from the traditional job security policy to adopt 'sustainable employability' as a new labor policy, which has become more visible within the public debate.

4.5. Discussion and conclusion

In this study, we described the formation and growth of two hybrid partnerships in the Rotterdam port region and analyzed their symbolic and substantive actions that were aimed to attain planned institutional change over time. Based on a comparative case study, we propose a multi-level process model of symbolic and substantive actions in three different phases across

micro-, field- and societal levels over time. This model is shown in Figure 4.4. Our results show that only RWORKS was able to go through all the steps to attain planned institutional change over time. A detailed overview of the main steps taken by RWORKS and RISI is presented in Table 4.5.

Figure 4.4. The process model of hybrid partnership development in attaining emergent and planned institutional change



Note. The *Solid line* represents the actions taken by hybrid partnerships in attaining institutional change.
The boxes at the top of the figure represent the change in the HR policy relationship, which is considered as institutional change in this study.

Table 4.5. Overview of main steps taken by RWORKS and RISI

Steps	RISI	RWORKS
1. Symbolic action: Promotion of pioneering idea by a champion	BLUE's idea was to collaborate with a diverse set of partners on regional social innovation activities. BLUE was spreading the word through informal language and his involvement in earlier activities.	PURPLE was seeking a solution to changes in the way organizations and people work. PURPLE used HR jargon and depicted earlier activities to specify her ideas.
2. Symbolic action: Mobilization of social and commercial actors behind the pioneering idea	BLUE found 4 allies for his ideas by reinforcing earlier activities in a successful international initiative to which he had contributed. Informal language and narratives were used to mobilize the actors.	Purple found 5 allies by reinforcing earlier activities in an initiative she launched. PURPLE also spread a 'circular economy of people circle' to symbolize her ideas and to give her ideas more meaning.
3. Substantive action: Adjustments of the idea to comply with the interests of social actors first	Meetings with social actors in the field enabled BLUE and his allies to obtain detailed information about the social actors' expectations. Introduction of vast quarterly meetings and monthly phone calls.	Requesting feedback from social and commercial actors in the field through phone calls, formal meetings and company visits.
4. Symbolic action: Reinforce social actors to develop social impact collectively	Official launch of RISI at a kick-off event to gain visibility and legitimacy of social actors in the field. RISI spread symbols and narratives through an official website and invited social actors to round table meetings.	Official launch RWORKS to position itself as a professional, well-organized partnership, capable of addressing social objectives to benefit the community. RWORKS spread symbols and narratives through e.g. a LinkedIn page.
5. Emergent inst. change Endorse new labor mobility opportunities and central position of HR	A spontaneous policy change where society started to perceive social innovation and HR as an important facet within the region.	An unintentional change: a sudden number of employment transfers occurred between organizations. Also, their statement "come, grow, go" became taken for granted.
6. Substantive action: Convince commercial actors of financial and efficiency objectives	RISI appointed a formal project leader, created extensive communication and strategy plans and updated its official website to ventilate a message to the commercial actors. RISI invited commercial organizations to round table meetings in which RISI clarified its commercial objectives.	RWORKS established e.g. a formal document called "rules of the game", which they reinforced to motivate commercial actors. Key actors of RWORKS spoke to commercial actors in the field about their goals and expectations. RWORKS took feedback from these actors exceptionally seriously.
7. Substantive action: Create internal alignment and a common understanding in the partnership	Introduced weekly phone calls among members, more frequent meetings (every three weeks) and vast e-mail communication.	Improved internal communication through more frequent phone-call and e-mail communication and changed the ownership of the LinkedIn page. Attention was devoted to internal communication, trust and stability.
8. Symbolic action: Pioneer narratives in the public domain to support social and commercial objectives	RISI communicated the introduction of a commercial party to manage the partnership and highlighted the appointment of a financial controller for the financial aspects of the partnership to improve its professional image.	RWORKS signaled their commercial and social objectives. Symbols and narratives were spread to the public domain through newspaper interviews, articles, websites of the organizations involved and word of mouth.
9. Planned inst. change Enactment of HR policy sustainable employability when LWA was signed	RISI had been unable to gain commercial actors' support and kept perceiving social and commercial objectives as incompatible. RISI was, therefore, unable to attain planned institutional change.	New HR policies were identified within the region where new understandings of legitimate behavior became reproduced outside the partnerships. The new policies are accepted and enacted by commercial and social actors who increasingly see employees as a source of expertise and a driving force for regional success.

Applying a paradox approach to the study of logic incompatibility (Jay, 2013; Clarke & MacDonald, 2019), we suggest that the ability to realize planned institutional change largely depends on the capacity of hybrid partnerships' members to recognize diverging commercial and social objectives – and their motivating logics – as paradoxical by adopting a paradoxical frame. In other words, to see these objectives as contradictory and interrelated (Smith & Besharov, 2019). According to Smith and Tushman (2005, p. 523) a "paradoxical frame is a mental template, which people impose to embrace seemingly contradictory dimensions of an action." This paradoxicality can cause some sort of conflict within people (Smith & Tushman, 2005), which makes them better able to embrace the contradictions (Miron-Spekter et al., 2011; Luscher & Lewis, 2008).

The finding that adopting paradoxical frames may enhance planned institutional change might look contradictory to previous studies on frames (e.g. Luscher & Lewis, 2008; Kremer & Erez, 2007). These prior studies demonstrate that institutional change would be most effective when concentrating solely on one challenging objective, rather than concentrating on two challenging objectives simultaneously. By contrast, our results show that focusing attention on the paradoxicality instead of the incompatibility of social and commercial objectives can enhance planned institutional change. However, we find that emergent institutional change can spontaneously occur prior to planned institutional change when hybrid partnerships focus attention on either social or commercial objectives. In this way, emergent change can occur even if hybrid partnerships perceive social and commercial objectives as incompatible. Building on our findings, we advance the following propositions:

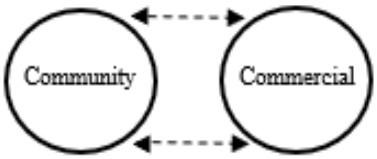
Proposition 1a: Hybrid partnerships that adopt paradoxical frames to embrace seemingly contradictory social and commercial objectives are likely to attain both emergent and planned institutional change over time.

Proposition 1b: Hybrid partnerships that are unable to adopt paradoxical frames and perceive social and commercial objectives as incompatible over time are likely to attain emergent institutional change, but not planned institutional change.

This study finds that the effectiveness (that is, the extent to which planned institutional change is realized) of adopting paradoxical frames is shaped by the different symbolic and substantive actions performed by hybrid partnerships. Previous scholars have argued that hybrid partnerships may leverage multiple logics' flexibility (Jay, 2013; Pache & Santos,

2013). Moreover, scholars have also looked at paradoxicality in a way of spreading ambiguous messages that diverse audiences can understand according to their expectations (Gümüsay et al., 2019) or in a way of adhering to the expectations of diverse audiences (Minzinneck & Besharov, 2018). Table 4.6 presents the comparison of incompatibility and paradoxicality of the commercial and community logics as characterized by RWORKS and RISI.

Table 4.6. Comparison of logic incompatibility and paradoxicality of the commercial and community logics as characterized by RWORKS and RISI

Characteristics	Logic incompatibility	Logic paradoxicality
		
Explanation	The inability of two logics to exist or occur because of differences in outlook and beliefs.	The ability of two logics to exist or occur together without problems or conflict.
RISI	RISI's members perceived commercial and social actor objectives as incompatible. Members feared that a market-oriented image could displease social actors.	RISI failed to guarantee the endorsement and support of commercial actors, and instead triggered their skepticism with its actions showing nonconformity with their objectives. RISI was, therefore, unable to attain logic paradoxicality.
RWORKS	In the formation and early adolescent growth phases, RWORKS perceived logics as incompatible as they first aligned with legitimate social actors in the field before aligning with legitimate commercial actors in the field.	In the maturity phase, RWORKS' members were able to motivate both commercial and social alignment due to its symbolic actions to social actors and substantive actions to commercial actors.

We propose that hybrid partnerships can leverage symbolic and substantive actions in sequence. Symbolic actions can influence societal perceptions of the hybrid partnership's members "by using more visual actions to obtain its objectives" (Oliver, 1991 p. 169). In the hybrid partnerships studied, symbolic actions are deployed first to either reinforce substantive actions of alignment or to align with social actors in the field. Substantive actions, on the other hand, are deployed later to motivate the need of commercial actors in the field, when symbolic

actions are incapable of doing so. Sequencing in both substantive and symbolic actions over time is, therefore, key to explain the role of paradoxical frames in attaining planned institutional change. Hence, we propose the following:

> *Proposition 2: Hybrid partnerships that first deploy symbolic actions to reinforce alignment with social actors and then deploy substantive actions to reinforce alignment with commercial actors are more likely to recombine diverging social and commercial objectives.*

Contrary to studies on institutional change that have looked at major institutional changes, such as a transition from autocracy to democracy (e.g., Ahmadijan & Robinson, 2001; Clemens & Cook, 1999; Romanelli & Tushmanm, 1994), we find that institutional reforms do not necessarily need to start as major reforms. Instead, these reforms can start small, which may have far-reaching effects. In the two cases studied, the reforms increasingly gained support and legitimacy in society because of the strong-willed and purposeful actions of a group of motivated actors who became institutional entrepreneurs as they took it upon themselves to modernize HR policies in the Rotterdam region.

We find that such an institutional change can start with one actor with a pioneering idea, a 'champion' who can mobilize actors in the field. The champion is able to activate a diverse group of people that collectively support the pioneering idea of the champion. This form of collective action is essential for gaining support for the desired change (Wijen & Ansari, 2007; Phillips et al., 2000). Adding to scholars such as Qureshi et al. (2016) and Battilana and Casciaro (2012), we show that planned institutional change is not merely about a single actor, but rather about several actors who utilize substantive and symbolic actions to create possibilities for institutional change to occur. Building on this insight, we develop the following proposition:

> *Proposition 3: Hybrid partnerships are likely to start at the micro-level in the formation phase with one actor with a pioneering idea, who is likely able to mobilize actors at the field-level in the adolescent growth phase, which eventually may lead to planned institutional change in the maturity phase.*

4.5.1. Theoretical contributions

Our study makes two important theoretical contributions. First, we contribute to the institutional entrepreneurship literature (e.g. Maguire et al., 2004; Skelcher & Smith, 2015; Battilana et al., 2009), and to studies on logic incompatibility in particular (e.g., Micelotta et al., 2017; Wright & Zammuto, 2013; Tina Dacin et al., 2002) by demonstrating that accepting and embracing the tensions around logic incompatibility enables hybrid partnerships to attain emergent and planned institutional change. In the institutional entrepreneurship literature, scholars have argued that individuals can react proactive or defensive to paradoxicality (e.g. Jay, 2013; Luscher & Lewis, 2008; Smith & Besharov, 2019), but we argue that generative outcomes will be determined by the ability of individuals to embrace paradoxicality rather than distrusting it. In this way, we find that planned institutional change largely depends on the capacity of hybrid partnership members to recognize diverging commercial and social objectives – and their motivating logics – as paradoxical. This paradox perspective (Jay, 2013; Clarke & MacDonald, 2019) on logic incompatibility brings new insights into the differences between the two different interrelated states of institutional change.

Second, studies in the field of hybrid partnerships have focused mainly on the formation of hybrid partnerships (Manning & Roessler, 2014; Koschmann et al., 2012), their outcomes (Clarke & MacDonald, 2019), different phases in their development (Selsky & Parker, 2005) and the process of partnership evolution (Klitsie et al., 2018; Gray et al., 2015; Lewin & Volberda, 2003). This study builds on this prior research by studying the different symbolic and substantive actions taken by members of the hybrid partnerships in a multi-level process model over time. This multi-level process model extends prior work on hybrid partnerships and multi-stakeholder collaboration (e.g., Wright & Zammuto, 2013; Klitsie et al., 2018; Micelotta et al., 2017; Gray et al., 2015) by linking the substantive and symbolic actions that occur in three different phases of the hybrid partnership evolution to micro-, field- and societal levels over time. Sequencing in both substantive and symbolic actions over time and different levels of analysis is, therefore, key to explain the role of hybrid partnerships in attaining emergent and planned institutional change.

4.5.2. Managerial implications

This paper has a number of important implications for hybrid partnerships and institutional actors that have to manage opposing commercial and community logics. Hybrid partnerships are often established when problems faced by organizations are complex and multi-faceted. It is important to consider the institutional context when examining the dynamics of collaboration

with other organizations. We have argued that the actors primarily shape the practice of hybrid partnerships at the field and societal level and it is, therefore, essential to grasp an understanding of the institutionalized rules, norms and practices at both levels. Organizations need to be aware that actors within hybrid partnerships can serve as powerful means to produce and reproduce institutional rules, practices or norms, which could eventually result in a novel institutional logic or environment. In this way, collaboration provides organizations, small and large, young and matured, with an opportunity not only to be involved in the renewal of institutional environments but also to strategically influence the direction of such renewal.

Based on the findings of this study, we argue that the opposing social and commercial objectives that hybrid partnerships can face, may necessitate paradoxical frames that can help people in their decision-making. When valuing paradoxicality, someone recognizes tensions that might exist between the objectives, but also realizes that accepting the tensions can produce novel solutions that advance social and commercial objectives simultaneously. This entails generating an idea that is beneficial to reconcile opposing commercial and social objectives. This paradoxical awareness helps hybrid partnerships to manage the sequence of symbolic and substantive actions in attaining planned institutional change over time.

4.5.3. Limitations and future research

Our study is not without limitations, which provides opportunities for future research. At first, in this study we focus on different phases of the hybrid partnership development over three years. Cooperation and competition dynamics tend to be different than when the partnership has gained years of a secure foothold (Nalebuff et al., 1996). Future research could explicitly consider the competitive dynamics that might occur after three years of foothold.

Second, although our data collection and analysis were limited to two cases within a particular region, we believe our theoretical insight on hybrid partnerships and institutional change is generalizable to other fields. However, adding a larger number of cases could provide a more powerful theoretical foundation. Further research may also contribute by studying a less dynamic context such as the IT sector, or a highly institutionalized environment such as healthcare, to explore whether the results apply across different contexts.

Third, in this study we focus on the community and commercial logics underpinning hybrid partnership development. Nevertheless, hybrid partnerships might have to manage and sequence substantive and symbolic actions differently if actors in the field adhere to a different logic, such as the state logic (Purdy & Gray, 2009). Studying different logics can be an interesting research opportunity for future studies.

Fourth, although our findings show that hybrid partnerships try to overcome the incompatibility of diverging logics, this does not necessarily imply that this is always the case. It might be easier and more beneficial for some hybrid partnerships to adopt paradoxical frames than for others. Future research can study under which circumstances and in which situations hybrid partnerships adopt paradoxical frames.

By shedding light on how hybrid partnerships can attain planned institutional change over time through adopting paradoxical frames of seemingly incompatible logics, we were able to develop a more fruitful explanation of how and why institutional change occurs.

Chapter 5.

5.1. General discussion and conclusion

Innovation is largely considered to be essential to create value and to prosper in the long run (Wang & Zatzick, 2019). Innovation is the ability of a firm to develop, direct and retain knowledge (Smith & Tushman, 2005) and as this knowledge resides within individuals (Grant, 1996), it could be reasoned that human resources play a substantial role in the development of innovation. Innovations such as virtual reality, big data, FinTech, drones, artificial intelligence and Internet of Things provide several new opportunities for firms, but also demand changes in processes and practices in organizations (Birkinshaw et al., 2008) and require investments in human-centered innovation such as strategic human resource (SHR) practices.

While studies have concentrated primarily on the role of R&D investment in enhancing innovation outcomes of firms (Srivastava & Gnyawali, 2011; Sampson, 2007; Barge-Gil & López, 2014), there is growing interest in understanding how strategic human resource (SHR) practices can enhance innovation outcomes (e.g. Chen & Huang, 2009; Laursen & Foss, 2003; Collins & Smith, 2006; Gardner et al., 2012; Li et al., 2018). In the end, investments in R&D only lead to firm innovation success and productivity gains when SHR practices are introduced where people learn how to use the new technology (Delery & Roumpi, 2017; Ortega-Argilés, 2009).

This dissertation was designed to fill a rather significant gap in the management literature, specifically the need for a theoretically grounded empirical research to study the effects of SHR practices on innovation outcomes in organizations and regions. Examining the role of SHR practices in turning knowledge (both technological and human knowledge) into new or improved products or services, may offer meaningful insights into how organizations and regions can enhance their welfare, macroeconomic progress and competitive advantage.

The studies presented in this dissertation were conducted in a logical sequence that helped to ensure that the indicated research objective could be met. Study I identifies the complementarity effects between SHR practices and R&D investments on firm innovation performance. Study II examines the effects of two SHR practices, specifically strategic skill flexibility and employee empowerment on organizational ambidexterity and studies the moderating effect of a dynamic environment in this relationship. Study III advances our understanding of how hybrid partnerships can attain institutional change by adopting paradoxical frames.

5.2. Key findings and contributions

In order to get a clear overview of the findings and contributions of the dissertation, a separation is made between the key findings and contributions of the individual studies included in the dissertation and the general findings and contributions of the dissertation. A clear overview of the findings and contributions of the three separate studies is presented in Table 5.1.

5.2.1. Study I

The first study used a multiple-case study approach to examine the complementarity effect of SHR practices and R&D on firm innovation outcomes. Data was collected by means of 68 semi-structured interviews and secondary data sources of 42 geographically proximate firms and other informants in the Port of Rotterdam, which is Europe's largest port and industrial complex. Based on the empirical analysis, the study finds that SHR practices and R&D investments tend to be clustered together to form different organizational configurations. The study also finds that the firms could be divided into three main organizational configurations, which were labeled *conventional* (little investment in R&D and SHR practices), *reforming* (moderate investment in R&D and SHR practices) and *game-changing* (substantial investment in R&D and SHR practices). The findings reveal that what is eventually essential for a firm to excel at innovation performance is its ability to invest heavily in a combination of four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and also in R&D so that synergies between the two can be maximized. As such, the benefits are greatest for game-changing firms that invest heavily in both SHR practices and R&D. The complementarity effect between technology and human resources is a research field that is emerging and that requires attention of future scholars. Future research might address the complementarity effect by extending the findings of this study with a larger set of firms, using a quantitative longitudinal research approach to draw causal inferences.

5.2.2. Study II

The second study presented in this dissertation examined how environmental dynamism moderates the relationship between strategic skill flexibility and employee empowerment on organizational ambidexterity. The results of a large-scale survey among 261 executives and managers in the Rotterdam port region support the hypothesis that both strategic skill flexibility and employee empowerment are positively related to organizational ambidexterity. Analyses of the data also indicate that when environmental dynamism is high, flexibility and

continuously renewing knowledge bases of employees are acknowledged to be essential to enhance innovation efforts (Kraaijenbrink et al., 2010). The firm may rely on the skill flexibility of employees to pioneer new products, services or markets and to increase efficiency through restructuring and process optimization (Bhattacharya et al., 2005). Interestingly though, this study does not support outcomes of prior studies (González-Benito et al., 2010; Doolen & Hacker, 2005) that indicate that the relationship between employee empowerment and organizational ambidexterity is negatively affected by environmental dynamism. The insignificant effect this study finds for this relationship is possibly due to the duration of studying environmental dynamism. It is likely that during longer periods of environmental dynamism, firms may find themselves trapped in focusing only on exploratory innovation to serve new customers or markets and may, therefore, become almost averse to exploitative innovation. Future studies should thus perform research over a longer time span in order to extend this research.

5.2.3. Study III

The third study presented in this dissertation explored how actors in hybrid partnerships that have to deal with divergent institutional logics can attain institutional change. The study described the formation and growth of two hybrid partnerships in the Rotterdam port region and analyzed their symbolic and substantive actions that were aimed to attain planned institutional change over time. Based on the comparative case study, a multi-level process model was proposed of symbolic and substantive actions in three different phases across micro-, field- and societal levels over time. The study detailed how the hybrid partnerships initially attain emergent institutional change and eventually attain planned institutional change through adopting paradoxical frames of seemingly incompatible logics. This paradoxicality causes some sort of conflict within people (Smith & Tushman, 2005), which makes them better able to embrace the contradictions (Miron-Spekter et al., 2011; Luscher & Lewis, 2008). This study was able to develop a richer explanation of how and why institutional change occurs, by shedding light on how hybrid partnerships can attain planned institutional change over time through adopting paradoxical frames of seemingly incompatible logics. By adopting a paradox perspective, this study was able to develop an explanation of how and why institutional change occurs.

Table 5.1. Overview of the main findings and contributions of the three studies

	Study I	Study II	Study III
Research question	What is the complementary effect of SHR practices and R&D investments on firm innovation performance?	How do firms realize organizational ambidexterity in a dynamic environment through micro-level activities in terms of strategic skill flexibility and employee empowerment?	How can actors in hybrid partnerships that have to deal with divergent institutional logics attain institutional change?
Key findings	What matters for a firm's high innovation performance is the ability to invest strongly in a combination of four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and high levels of R&D-investments such that synergies between the two are maximized. As such, the benefits are greatest for game-changing firms that invest relatively heavily in SHR practices and R&D.	Both strategic skill flexibility and employee empowerment nurture organizational ambidexterity. Especially in highly dynamic environments, strategic skill flexibility is an important aspect to achieve organizational ambidexterity. This opens up promising research avenues concerning the role of micro-foundations in achieving organizational ambidexterity.	If actors embedded within hybrid partnerships can interpret divergent social and commercial objectives as paradoxical – that is, as contradictory but interrelated rather than as incompatible – that is, impossible to reconcile, hybrid partnerships are able to attain planned institutional change. The study, therefore, demonstrates that members of hybrid partnerships should adopt paradoxical mindsets to attain planned institutional change over time.
Theoretical contribution	This study adds to research on complementarities (Milgrom & Robters, 1995; Whittington et al., 1999) by showing how complementarity between substantial investment in SHR practices (e.g. Chen & Huang, 2009; Laursen & Foss, 2003) and R&D (e.g. Barge-Gil & López, 2014; Sampson, 2007) can lead to the highest innovation outcomes for firms. The study makes an empirical contribution by adding to qualitative work in the field of complementarities (Peter & Robert, 2015; Madsen & Ulhøi, 2005) and by adding to research on the configurational approach (e.g. Miller, 2018; Delmas & Pekovic, 2018).	The study enhances the understanding of the micro-foundations of organizational ambidexterity (e.g., Grigoriou & Rothaermel, 2014; Junni et al., 2015) by clarifying the role of employee empowerment and strategic skill flexibility in reconciling the conflicting demands of exploitation and exploration in highly dynamic environments (Huang & Kim, 2013; Yitzhack et al., 2015). The study makes an empirical contribution by testing the relationship between micro-foundations and organizational ambidexterity using a large-scale survey of executives and senior managers from a diverse set of firms in multiple industries.	This study contributes to the institutional entrepreneurship literature (e.g. Skelcher & Smith, 2015; Battilana et al., 2009) and to the literature on logic incompatibility (e.g., Micelotta et al., 2017; Wright & Zammuto, 2013) by having a paradox perspective (Jay, 2013; Clarke & MacDonald, 2019). This brings new insights into the differences between attaining emergent and planned institutional change. Second, we add to the literature on hybrid partnerships and multi-stakeholder collaboration (e.g., Micelotta et al., 2017; Klitsie et al., 2018; Gray et al., 2015) by addressing the different symbolic and substantive actions taken by members of the hybrid partnerships in a multi-level process model over time.

5.3. Overarching scientific contributions of the research

The objective of this research is to unravel the importance of SHR practices by increasing our understanding of how, and under which conditions, SHR practices contribute to enhancing innovation outcomes in organizations and regions. This research provides various scientific contributions, which include both theoretical and empirical ones in order to reach the overall objective. These can be clustered into four predominant areas:

- The human side of innovation
- Strategic human resource (SHR) practices
- Micro-foundations of macro-level outcomes
- Empirical contributions

5.3.1. The human side of innovation

The dissertation's first overall scientific contribution is that it addresses the call from scholars (e.g. Teece, 2010; Damanpour & Aravind, 2012; Volberda et al., 2013; 2014) to conduct more research both on the human and technological perspectives in the innovation literature. Regardless of the acknowledgement by management scholars to study the human side of innovation (e.g. Vaccaro et al., 2012; Teece, 2010; Damanpour, 2014; Khanagha et al., 2013), innovation is still predominantly conceptualized as technologically driven. The human perspective of innovation, which is embraced in this research, emphasizes the human-centered perspective of innovation (De Jong & Den Hartog, 2010; Van den Bosch, 2012; Khanagha et al., 2013; Dhondt et al., 2015). This perspective entails the advancement and enactment of novel practices such as SHR practices (e.g., Chen & Huang, 2009; Volberda et al., 2014; Laursen & Foss, 2003; Damanpour & Aravind, 2012). Novel management practices, and in particular SHR practices and their relationship with new technologies and technological know-how, is an underexplored topic (e.g. Dhondt et al., 2015; Walker et al., 2010; Damanpour, 2014; Volberda et al., 2014). Damanpour (2014, p. 1279) stresses the importance for scholars to "devote attention both to the non-technological and technological aspects of innovation in order to better understand the overall innovation process." This dissertation, therefore, directs the imbalance that exists within the current innovation literature.

Study I provides evidence of how innovation activities can be fostered by perceiving the humans side and technological side of innovation as complementary. The study shows that investing in human-centered innovation can create a resilient workforce that is capable of

dealing with various rapid social-, economic- and technological changes (Wright & McMahan, 2011). Study II shows that the freedom and authority that is given to employees to perform and control their tasks (Bowen & Lawler, 1992) and the unique set of knowledge and skills that reside within employees (Smith & Tushman, 2005) are necessary ingredients to balance exploration and exploitation. Study III provides evidence that traditional HR policies are increasingly becoming inadequate (Lendel & Varmus, 2011) and a shift towards new HR policies is necessary. Successful firms are the ones that can collaborate with other organizations in a particular region to implement an innovative regional HR strategy, invest in labor mobility opportunities and are able to spread the strategy throughout the organization and the region.

By addressing the human-centered innovation perspective, this dissertation adds to the so-called "new age of innovation research" (Maglio et al., 2015, p. 4), which reveals that the key to creating unique firm value and to ensuring a sustainable competitive advantage, is to a large extent dependent on the human resources of firms (Hamel, 2006; Birkinshaw et al., 2008; Damanpour et al., 2010).

5.3.2. Strategic human resource (SHR) practices

The dissertation's second overall scientific contribution is that it adds to the strategic human resource management literature and specifically addresses the literature on SHR practices (Chen & Huang, 2009; Collins & Clark, 2003; Delery & Doty, 1996). In doing so, this research presents the possibility to underline the value of human resources within organizations and in port regions in general. Studies on port regions have been remarkably quiet on the topic of SHR practices and are highly dominated by a focus on technological innovations (Hollen, 2015; De Martino et al., 2013).

Study I adds to the literature on SHR practices by denoting that investing strongly in especially four SHR practices, which are flexible working roles, training and development, employee wellbeing and co-working, in combination with high investments in R&D is vital for high firm innovation outcomes. Study II provides meaningful insights into two increasingly theoretical important SHR practices, which are strategic skill flexibility and employee empowerment, as being micro-level antecedents of reconciling both exploitative and exploratory innovation in efforts to attain organizational ambidexterity. This study advances the understanding of how two SHR practices enable organizations to become more ambidextrous. Study III sheds light on the broader institutional environment. This study examines how one highly important SHR practice, being inter-organizational collaboration, which is defined as hybrid partnerships in the study, is related to institutional change. The study changes the focus from the individual

and organizational level to the broader institutional environment to understand how hybrid partnerships are able to create synergies among individuals, organizations and society overall. All three studies address human resource allocation and recombination, which is largely disregarded in studies on port value creation and innovation (De Martino et al., 2013).

5.3.3. Micro-foundations of macro-level outcomes

The dissertation's third overall scientific contribution is to enhance our understanding of the micro-foundations of macro-level outcomes (e.g. Junni et al., 2015; Grigoriou & Rothaermel, 2014). Studies I, II and III examine how the action and interaction of individuals leads to organizational-level or societal-level outcomes and how relationships between variables at the micro level are moderated by actions and interactions at the macro level (e.g. Felin et al., 2015; Foss & Lindenberg, 2013; Barney & Felin, 2013). Individuals play an essential role throughout the studies included in this dissertation, which adds an important dimension to the literature on micro-foundations (Smith, 2014; Smith & Tushman, 2005). In this way, this dissertation tries to diminish the gap between micro- and macro perspectives that still exists in the management literature (Skelcher & Smith, 2015; Suddaby et al., 2007).

Study I shows that eventually it is the people that work within the organization who are able to exploit current knowledge and explore new knowledge to achieve favorable results at the organizational-level. Study II investigates how successfully managing the paradoxical challenges of organizational ambidexterity depends on particular skills, abilities and traits of individuals. Most studies have considered macro-level explanations of organizational ambidexterity (denoted by arrow 4 in Figure 3.1). The difficulty with such explanations at the macro level, however, is that there might be several other micro-level clarifications that cannot be revealed with a macro-level study (Minbaeva, 2013). Examining organizational ambidexterity by looking at its micro-level antecedents might, therefore, be vital in order to understand its underlying principles (Coleman, 1990; Foss et al., 2010; Mills et al., 2006). Study III shows how individuals, triggered by either endogenous or exogenous forces (Voccaro et al., 2012; Birkinshaw et al., 2008), can become institutional entrepreneurs who may be collectively motivated to attain institutional change.

5.3.4. Empirical contributions

The last scientific contribution of this dissertation is empirical. Large-scale survey research and extensive case study research on SHR practices and their effects on innovation outcomes, is relatively scarce. The studies in this dissertation make empirical contributions by both testing

and exploring outcomes of the main variables utilized in this research among executives, directors, managers and employees of a diverse set of organizations in multiple sectors in the Rotterdam port region. This dissertation, therefore, addresses both the absence of exploratory qualitative studies in the research field (Olson et al., 2018; Delmas & Pekovic, 2018) and the dearth of large-scale survey research in the research field (Lepak et al., 2003; Jansen et al., 2009; Volberda et al., 2013).

Studies I and II perform an exploratory multiple-case study of various organizations in the Rotterdam port region. A variety of CEOs, directors, managers, project leaders, government officials, associates, union negotiators, educational staff and other individuals were interviewed and a lot of participant observations were performed during business meetings, strategic plan settings, conference calls and conversations. This provided the opportunity to explore the unique port and industrial complex setting more profoundly and gave in-depth information on the role of individuals, organizations and society overall. Study II conducts a large-scale survey among several organizations in the Rotterdam port region operating in various sectors to measure the exploratory and exploitative innovation performance effects of two SHR practices. The large-scale survey that is used, is part of a more extensive survey (*Port Competition and Innovation Barometer*) that measures human resource management and innovation in the Rotterdam port region.

Table 5.2. summarizes the overall scientific contributions and related literature gaps that are addressed in the dissertation.

Table 5.2. Overall scientific contributions and related literature gaps addressed in the dissertation

Overall scientific contributions	Related literature gaps
Directing the imbalance that exists within the current innovation literature (e.g., Teece, 2010; Damanpour, 2014; Schiuma, 2017), where the main focus is still on technological innovation. This dissertation sheds light on how to foster human-centered innovation.	Human-centered innovation, and in particular the influence of humans in the achievement of innovation outcomes (e.g. Damanpour, 2014; Volberda et al., 2014; Mol & Birkinshaw, 2009), is an emerging yet underexplored topic.
Empirically examining the concept of SHR practices (Chen & Huang, 2009; Collins & Clark, 2003; Delery & Doty, 1996) in relationship to innovation outcomes. This research presents the possibility to underline the value of human resources within organizations and regions.	Strategic human resource allocation and recombination are generally overlooked in the management literature (Duke & Udono, 2012; Chen & Huang, 2009; Laursen & Foss, 2003), and more specifically in the analysis of port value creation and innovation (Hollen, 2015; De Martino et al., 2013).
Exploring the action and interaction of individuals and how those can lead to collective, organizational-level outcomes. This dissertation identifies how relationships between variables at the micro-level are moderated by actions and interactions at the macro-level (e.g. Felin et al., 2015; Foss & Lindenberg, 2013; Greve, 2013; Barney & Felin, 2013; Grigoriou & Rothaermel, 2014).	Unless the growing interest from innovation and strategy scholars in the micro-foundations that affect organizational outcomes (e.g., Felin et al., 2015; Grigoriou & Rothaermel, 2014; Barney & Felin, 2013; Greve, 2013; Foss & Lindenberg, 2013), they are still relatively under-explored (Koryak et al., 2018; Benner & Tushman, 2015; O'Reilly & Tushman, 2013).
Underlining the importance to both explore and test the sources and outcomes of the key variables of interest used in this research among CEOs, directors, managers and employees of a diverse set of organizations (e.g. Burgers et al., 2009; Lepak et al., 2003) in multiple industries.	This dissertation addresses both the lack of exploratory qualitative studies (e.g. Delmas & Pekovic, 2018; Olson et al., 2018) and the lack of large-scale survey research (e.g., Schilke, 2014; Jansen et al., 2009) on SHR practices in relation to innovation outcomes (Volberda et al., 2013; Jansen et al., 2009).

5.4. Managerial implications

This dissertation and its main findings provide several important insights for organizations and regions. The research was designed and executed in close collaboration with a number of industry players in the Rotterdam port region. The intermediate findings were frequently presented to the top management teams, CEOs, managers and employees of firms and their feedback was integrated into subsequent phases of the research. Consequently, most of the findings of this dissertation are highly appropriate for the Rotterdam port region. An overview of the main managerial implications of this research is presented in Table 5.3.

Table 5.3. Main managerial implications

• This dissertation highlights the importance for organizations to innovate beyond the technological domain and to focus on the human-centered innovation approach in order to improve successful innovation outcomes (Studies I, II and III).
• In order to gain high innovation performance, organizations need to invest both strongly in a combination of four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and high levels of R&D-investments such that synergies between the two are maximized (Study Ⅰ).
• Organizations may create a strategic balance between exploitative and exploratory innovation in order to enhance their ability to respond properly to changing environmental demands and to build a common ground. Ignoring individual-level aspects may hamper the success of the organization (Study II).
• Organizations may need to create a workforce with a broad skills base, where employees can make their own decisions and where top-down rules and policies are implemented solely to guide strategic boundaries. This may have implications for organizational aspects such as governance structures, employee evaluation procedures and reward systems. Individual-level activities such as strategic skill flexibility and employee empowerment need to be set high on the agenda in firms (Study II).
• Organizations need to be aware that actors within hybrid partnerships can serve as powerful means to produce and reproduce institutional rules, practices or norms, which could eventually result in a novel institutional logic or environment. In this way, collaboration provides organizations, small or large, young or matured, with an opportunity not only to be involved in the development of novel institutional environments, but also to have an influence on the direction of that development (Study III).

This dissertation shows that as the Fourth Industrial Revolution (characterized by digitalization, automation, robotics and the transition towards renewable energy sources) unfolds across the globe, capitalizing on the human resources in ports is of fundamental importance for dealing with these challenges in a way that fosters competitiveness and economic growth (Studies I, II and III). After all, it is people who steer a modern port in the right direction. In the coming years, the quality and resilience of the (future) workforce will become the decisive factor for the competitiveness and innovative power of ports and port-regions. In order to gain high innovation performance, organizations need to invest both strongly in a coherent combination of four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and high levels of R&D-investments such that synergies between the two are maximized (Study I). At the same time, organizations may need to create a workforce with a broad skills base, where employees can make their own decisions and where top-down rules and policies are implemented only to direct strategic boundaries (Study II).

The Rotterdam region has many challenges in this; with a high demand for well-trained staff, a relatively high unemployment rate and a sizable skill gap of the current and future workforce. A recent survey that was distributed in the Rotterdam port region concludes that at least 50% of the workforce in the region will require reskilling of some duration until 2023 (Port Competition and Innovation Barometer, 2019). This induces a mismatch between talent, education and work, which will disclose in the near future. Moreover, new types of organizations will appear such as cloud computing providers, data systems analyzers and various solar energy firms. New sectors will arise such as digital security, data science and virtual platforms, which will have a substantial impact on the efficiency and innovativeness of organizations (Wang & Zatzick, 2019).

For the Fourth Industrial Revolution to result in positive outcomes for the employees inside and outside the Rotterdam port region, a collective effort for bundling investments and commitment in education, regional reskilling and upskilling plans at every stage of development is paramount (Studies I, II and III). However, this requires cooperation and synergy between the (local) government, port-firms, labor unions, educational institutes and the Port Authority. In this way, collaboration provides organizations, small or large, young or matured, with an opportunity not only to be involved in the development of novel institutional environments, but also to have an influence on the direction of that development (Study III).

Each actor (individual and organization) has to take its own responsibility, as shown in Table 5.4.

Table 5.4. Implications for organizations in the Rotterdam port region

- *Port-firms* should take more responsibility for their employees, should take an active role in reskilling and upskilling employees, and should become aware that it is essential to invest in people now to ensure that their workforce achieves its full potential in the future as well.

- *The (local) government* has to create an enabling environment to assist in re-skilling and upskilling efforts by means of improved education policies intended to quickly raise skills (both technical and social) and education levels of people of all educational backgrounds, ethnic backgrounds and ages. Moreover, enhanced social safety nets are necessary to better support the people who are most vulnerable to job loss in the future labor market. For instance, through reforming social protection schemes, or by moving to a new model such as the idea of a basic income.

- *Educational institutes* have to take a proactive role in collaborating with organizations to minimize skill gaps, to actively search for new (technical and social) skills and to make them quickly inherent and available for the market. For a successful transition in the educational system, a suitable training and development infrastructure is essential.

- *The Port Authority* should take a pioneering role in making the port an example in the Fourth Industrial Revolution and create a HR infrastructure that revisits educational and career models by investing in, for example, a regional skills lab, a skills passport, several regional HR initatives and regional upskilling and retraining programs.

- *Individuals* ought to take personal responsibility and a proactive role in their own lifelong learning and career development. They should become aware that labor mobility and skill flexibility are crucial aspects to be eligible to work in the future. An important aspect in this, is that individuals need to be supported through periods of job transition.

5.5. Policy implications

Next to managerial implications, this dissertation also has policy implications. This dissertation denotes the importance for organizations and regions to change to a human-centered policy approach where individual needs, wishes and capabilities become central aspects. These human-centered policies are highly important for the Rotterdam port region as the Fourth Industrial Revolution will give rise to several new job roles, occupations and tasks. New roles will be created such as search engine optimization managers, port data processing experts and application software developers (Study I). Part of the new employment will arise outside the Rotterdam port region, for instance in the construction and installation sectors. Consider the installation of solar panels, isolation of homes and sustainable electricity for heating and cooking. Policies must identify pathways to capitalize on the positive aspects (how to let human resource be complementary to new technological innovations) of human resources.

In this way, it is essential that the (local) government, the business world and scientific community collaborate closely to create policies for a regional workforce that is capable of dealing with social-, technological- and environmental changes. It is important for the policies to focus on three core activities: school-to-work, work-to-work, and return-to-work[1]. The focal activities concentrate on giving employees skills matching with the needs of organizations in the port, by providing training for its current and future talents, and by having as many people from Rotterdam and its surroundings employed in the port region.

5.5.1. School-to-work policies

The organizations in the Rotterdam port region point to the relatively large gap between the skills students possess and the skills that organizations require. The local government must, therefore, implement policies aimed to smoothen the transition from school to work. This involves two aspects: conversations with port-firms about the skills, abilities and knowledge that are required and it also involves conversations with educational institutes to apply alterations in the educational curricula (Studies I and II).

The school-to-work policies should focus both on scholars and students in order to gain the right skills and knowledge, but also on current employees as there should be policies that support persons throughout their whole working life. For instance, policies can be implemented

[1] The three core activities school-to-work, work-to-work and return-to-work that have been discovered by the author of this dissertation, were implemented in the LWA (LeerWerkAkkoord) that was signed in Rotterdam on February 5, 2019.

about providing intermediate vocational education and higher professional education. This includes continuous training and development of current employees to keep them updated and to enhance the ease of transferring employees to another firm, job, project or task. In order to establish the school-to-work policies, it is important to involve students, employees, educational institutes, the (local) government and port-firms in the implementation process of school-to-work policies.

5.5.2. Work-to-work policies

As job functions change, new specializations arise and work occasionally disappears, it is essential to prepare the port's business community for this transition through labor mobility policies. As study III shows, organizations in the Rotterdam port region provide both temporary and permanent work experience places for the entire working population (18-65 years) through for instance, RISI and RWORKS. This provides employees with the chance to develop themselves further, to apply the learned knowledge in a different organization and to absorb knowledge from outside the 'parent' organization. Therefore, labor mobility policies should be established by organizations in the Rotterdam port region to make sure that employees will stay more attractive in the port labor market, through continuously learning new skills and abilities.

Similarly, it is beneficial for organizations to make use of the knowledge and talents of employees in other organizations in the region (Study III). In doing so, qualified applicants who have the ambition but cannot develop themselves further in one firm can be actively offered an alternative task, project or job in another firm. Policies directed in this way, enhance the mobility of employees in the Rotterdam port region.

5.5.3. Return-to-work policies

With growing shortages in the labor market in the port and a relatively high unemployment rate in the Rotterdam port region, there are countless job opportunities for people in the region who are currently looking for employment. Through collaborative forms between the government, educational institutions and firms, the Rotterdam port region should seek to establish policies that help unemployed people in gaining the right skills and in becoming more empowered (study II) to find a job. Moreover, it is beneficial for the region to match people with the right job, and help young people acquire basic qualifications. Especially young people aged between sixteen and twenty-five who have not finished high school or lack a basic qualification, have a large distance to the labor market and experience considerable barriers in

their search for a job. Helping this target group in finding a job in the Rotterdam port region is beneficial for organizations that have trouble finding employees, for the current unemployed employees who will find a job and for society as it lowers the unemployment rate and social security costs.

Besides, the municipality should collaborate with organizations operating in the Rotterdam port region (Study III), to promote the hiring of present unemployed people in organizations in the Rotterdam port region. This may involve people who lack basic qualifications, people who have been dismissed, people with disabilities or refugees.

5.6. Limitations and suggestions for future studies

Despite the various theoretical and empirical contributions, this section provides the limitations and a number of suggestions for future studies. At first, the limitations and suggestions for future studies of each individual study are discussed (see Table 5.5), before deliberating on the overall limitations and suggestions for future studies of this dissertation (see Table 5.6).

5.6.1. Limitations and suggestions for future studies of each individual study

In Table 5.5 a distinction is made between limitations and future research that are addressed from a theoretical perspective (theory-based) and the ones that are addressed from an empirical perspective. The ones that are addressed from an empirical perspective especially concern the longitudinal aspect of the data collection. For instance, studies I and III address the issue of replicating and extending the findings with a larger set of firms over more extended periods of time, by using a quantitative longitudinal research approach to study the causality. Study II denotes the importance of studying other factors (e.g., decentralization or formalization) that moderate the relationship between micro-level activities and organizational ambidexterity.

Table 5.5. Limitations and suggestions for future studies of each individual study

	Theoretical perspective	Empirical perspective
Study I	• Most firms are not entirely free in their decisions regarding SHR practices and R&D investments, given the various contingencies they face. Future research could examine the conditions in which firms invest in SHR practices and R&D. • The findings largely support the complementarity and configurational premises, but using a broader range of theoretical perspectives would, in the long run, produce a more complete and useful synthesis.	• The findings emerge from data collected in a single context and country, which enabled an in-depth study. Future research might extend the findings with a larger set of firms, in another cultural context using a longitudinal quantitative research design to draw causal inferences.
Study II	• While both strategic skill flexibility and employee empowerment are important micro-foundations of innovation, future studies can examine other micro-level antecedents of organizational ambidexterity i.e. leadership style of top management teams or specific attributes of individuals. • This study implies that achieving organizational ambidexterity leads to the greatest returns for firms. However, firms might focus on exploitative innovation in one period of time, and on exploratory innovation in another period of time. Future studies could, therefore, examine the longitudinal and temporal separation of exploratory and exploitative innovation within firms.	• Future studies might reveal other factors (e.g., decentralization or formalization) that moderate the relationship between micro-level activities and organizational ambidexterity. • This study could not entirely account for multi-level reasoning when examining the micro-macro relationships. Future studies should address this by conducting multi-level research at the employee- and organizational levels.
Study III	• Hybrid partnerships might manage and sequence substantive and symbolic actions differently if actors in the field adhere to other logics than the community and commercial logics. Studying different logics (e.g. the state logic) can be an interesting research opportunity for future studies. • It might be easier and more beneficial for some hybrid partnerships to adopt paradoxical frames than for others. Future research can study under which conditions and in which situations hybrid partnerships adopt paradoxical frames.	• The data collection and analysis is limited to two cases within a particular region. Adding a larger number of cases could • Provide a more powerful theoretical foundation. • Future research may study a less dynamic context such as the IT sector, or a highly institutionalized environment such as hospitals.

5.6.2. General limitations and suggestions for future studies

In this section, a number of general limitations and suggestions for future studies regarding this research are presented (see Table 5.6.).

First, this dissertation examines the role of SHR practices to enhance innovation outcomes in organizations and regions. While this dissertation finds and, therefore, focuses on particular SHR practices, which could be highly important SHR practices to explain innovation outcomes, other micro-level antecedents related to human resources might also be important antecedents of innovation outcomes. Several scholars (e.g. Yitzhack et al., 2015; Jansen et al., 2009; Birkinshaw & Gupta, 2013) have made suggestions as to how for instance, selectivity in recruiting, compensation and benefits, and self-managed teams might also serve as important antecedents of innovation outcomes. Besides, in this dissertation, it is not empirically tested how the SHR practices are causally related to each other, because the focus of this dissertation is to examine the innovation outcomes of SHR practices. This leaves opportunities for scholars to study and empirically test the complementarity effect among a broad range of SHR practices that can have impact on innovation outcomes.

Second, the fundamental rationale of the studies included in the dissertation is predominantly focused on the concept of SHR practices (e.g., Way et al., 2018; Chen & Huang, 2009; Chand & Katou, 2007; Laursen & Foss, 2003; Collins & Clark, 2003; Davies et al., 2001; Delery & Doty, 1996). Study II complements this perspective with the micro-foundations perspective (e.g., Grigoriou & Rothaermel, 2014; Foss & Lindenberg, 2013; Greve, 2013; Felin et al., 2015; Barney & Felin, 2013; Junni et al., 2015). Study III complements this perspective even further by providing an understanding of how and to what extent one specific SHR practice being inter-organizational collaboration (defined as hybrid partnerships in this study) can attain institutional change. Study III highlights the role of actors within hybrid partnerships as institutional entrepreneurs (e.g. Maguire et al., 2004; Skelcher & Smith, 2015; Battilana et al., 2009). However, in addition to the various managerial and organizational perspectives taken in this dissertation, it would be valuable to study the topic from a historical-cultural or legal perspective. This could be important in order to build a stronger theoretical foundation for human-centered innovation in the literature.

Third, the findings emerge from data collected in a single context and country. In this way, a particular regional innovation ecosystem was studied in this dissertation, which is associated with the growing devotion to regional business activities to perceive the region as relevant for innovation-centered activities (De Noni et al., 2018; Vértesy, 2017; Yam et al., 2011). Actors in this regional innovation ecosystem might include firms, educational institutes, research

centers, governmental agencies, employees and several other organizations that provide various forms of (policy) support for the region (Cooke, 2001). The organizations share a similar social and institutional context and contribute to learning and innovation in a given region (Hartley et al., 2013; Fritsch & Franke, 2004; Etzkowitz & Leydesdorff, 2000). However, the three studies limit themselves to one particular regional innovation ecosystem, being the Rotterdam port region. In order to extend the outcomes of this dissertation, there is currently an international research ongoing to benchmark several international port regions in the field of human resource development and education. The results of the current ongoing study can provide interesting additions to this dissertation.

Fourth, this dissertation focuses on innovation outcomes in organizations and regions. It can be valuable for scholars to extend this research by examining other output measures, such as revenue growth, profit growth, economic value added (EVA) or return on investment (ROI). Besides, it is important when we talk about human resources and its effects on organizations, to study the output measures related to human resources, such as employee satisfaction, quality of work, level of creativity, employee feedback or employee health. In this dissertation, environmental and social outputs were measured by studying institutional change in the Rotterdam port region. This provides an interesting additional perspective to the first and second studies. Conducting empirical studies with other performance measures would allow the conclusions of this dissertation to be expanded.

Table 5.6. General limitations and suggestions for future studies

• This dissertation finds and, therefore, focuses on several important SHR practices, but other SHR practices or other micro-level antecedents can also provide important explanations for enhancing innovation outcomes in organizations and regions. This leaves opportunities for scholars to study and empirically test the complementarity effect among a broad range of SHR practices to leverage the influence on innovation outcomes.
• In addition to the various managerial and organizational perspectives taken within the studies in this dissertation, it would be valuable to examine the topic from a historical-cultural or legal perspective.
• This study focuses on a highly important region, being the Rotterdam port region. In order to extend this research, it can be an interesting research opportunity to study other regions.
• This dissertation focuses on innovation outcomes in organizations and regions. It can be valuable for scholars to study other output measures, such as revenue growth, profit growth, economic value added (EVA) or return on investment (ROI). Moreover, it is important to study output measures related to human resources, such as employee satisfaction, quality of work, level of creativity, employee feedback or employee health.

5.7. Conclusion

By examining the role of various types of SHR practices and their effects on innovation outcomes in organizations and regions, this dissertation offers new insights into how added value could be derived from human resources in organizations and regions. The three studies show that in the end, technological investments only lead to high innovation outcomes and productivity gains when SHR practices are introduced where people learn how to apply the new technology. No matter what direction the Fourth Industrial Revolution will head to, this research attempts to provide an important first step in realizing the benefits for organizations and regions to invest extensively in human-centered innovation. This dissertation, therefore, offers valuable observations for scholars and organizations operating in the Rotterdam port region and assures to be a foundation for future studies on human-centered innovation, which places people as a central part of organizations and society. In the end, it is the people in the organization that make innovation work.

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SOCIAL INNOVATION



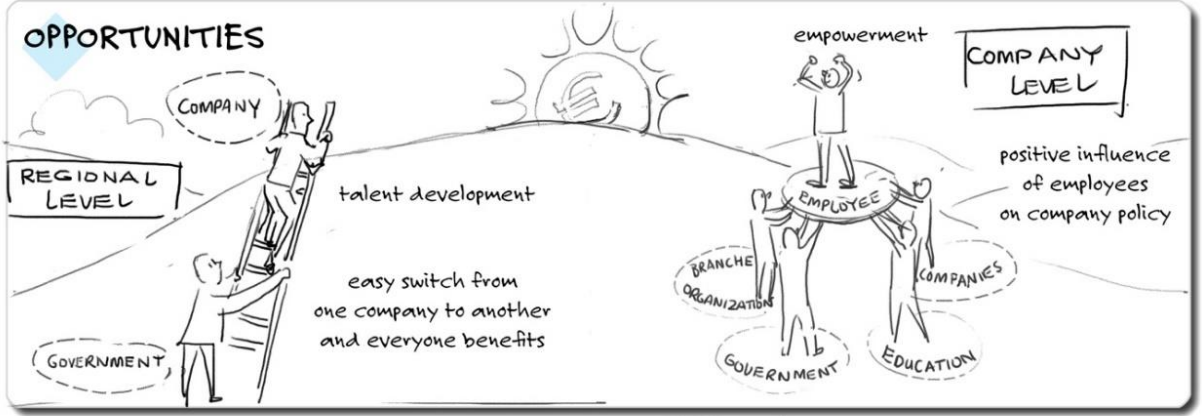
investing in employees as an asset

IMPACT



Companies that invest in both TECHNICAL and SOCIAL innovations are the real game changers and best equipped for the future

OPPORTUNITIES



RESEARCH



CHALLENGES



TO SHOW RETURN OF INVESTMENTS OF SOCIAL INNOVATION

SUPPORTING NEWCOMERS TO STAY GAMECHANGING



PARTNERS

Port of Rotterdam

University of Amsterdam

City of Rotterdam

Deltalinqs

Erasmus University Rotterdam

SMART PORT

Summary

To survive in the current rapidly changing environment, firms invest profoundly in innovation activities (Tidd & Bessant, 2018). Innovation is widely acknowledged as being critical for firms to create value and to prosper in the long run (Wang & Zatzick, 2019). While scholars have concentrated primarily on the role of technology in enhancing firm innovation performance (Srivastava & Gnyawali, 2011; Sampson, 2007; Barge-Gil & López, 2014), there is growing interest in understanding human-centered innovation (e.g. Volberda et al., 2007; 2013; 2014; Damanpour & Aravind, 2012; Dhondt et al., 2015; Birkinshaw et al., 2008; De Jong & Den Hartog, 2010; Hamel, 2006). This new age of innovation research reveals that the key to creating unique firm value and to ensuring a sustainable competitive advantage, is highly dependent on the human resources of firms (Damanpour, 2014; Walker et al., 2010; Hamel, 2006; Birkinshaw et al., 2008; De Jong & Den Hartog, 2010).

Next to investments in technology, firms, therefore, also need to invest in their human resources. This demands alteration in firm processes and practices (Birkinshaw et al., 2008) and requires investments in strategic human resource (SHR) practices. In the end, investments in technology only lead to high innovation outcomes and productivity gains when SHR practices (characterized as innovative work practices that are new-to-the-firm) are introduced where people learn how to apply the new technology (Ortega-Argilés, 2009). The premise underlying SHR practices is that firms provide value through human resources, which investments in technology alone cannot achieve (Rees & Smith, 2017; Pfeffer, 2005). Despite the growing interest in understanding how SHR practices can enhance innovation outcomes (e.g. Gardner et al., 2012; Li et al., 2018; Collins & Smith, 2006), the scientific evidence remains equivocal.

This dissertation was designed to fill a rather significant gap in the management literature, specifically the need for a theoretically grounded empirical study to explore the effects of SHR practices on innovation outcomes in organizations and regions. Examining how and under which conditions, SHR practices can lead to enhanced innovation outcomes in organizations and regions can offer important new insights into how firms, as well as, regions can increase their chances of survival and prosperity. The three empirical studies presented in this dissertation were conducted in a port-related context.

Study I identifies the complementarity effects between SHR practices and R&D investments on firm innovation performance. The study finds that what matters for a firm's high innovation performance is its ability to invest strongly in a combination of four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and high levels of R&D-investments in such a way that the synergies between the two are maximized. As such, the benefits are greatest for game-changing firms that invest relatively heavily in SHR practices and R&D. Study II provides an understanding of two SHR practices, specifically strategic skill flexibility and employee empowerment and their effects on organizational ambidexterity and examines the moderating role of environmental dynamism in this relationship. The results of the study show that especially in highly dynamic environments, strategic skill flexibility is important to achieve organizational ambidexterity. Study III complements this perspective by focusing on one specific SHR practice, being multi-stakeholder collaboration – referred to as hybrid partnerships – in relationship with institutional change. The study demonstrates that if actors embedded within hybrid partnerships are able to interpret divergent social and commercial objectives as paradoxical – that is, as contradictory but interrelated rather than as incompatible, hybrid partnerships can attain planned institutional change.

The contributions of the dissertation are manifold. First, this dissertation directs the imbalance that exists within the current innovation literature (e.g., Teece, 2010; Damanpour, 2014; Schiuma, 2017), where the main focus is still on technological innovation. This dissertation sheds light on how to foster human-centered innovation activities. Second, the dissertation contributes to the literature on SHR practices (Chen & Huang, 2009; Collins & Clark, 2003; Delery & Doty, 1996) and presents the possibility to underline the value of human resources within firms and in port complexes in general. Third, this dissertation tries to uncover how the action and interaction of individuals can lead to collective, macro-level outcomes (e.g. Grigoriou & Rothaermel, 2014; Foss & Lindenberg, 2013; Felin et al., 2015). In this way, this dissertation tries to diminish the gap between micro- and macro perspectives in the management literature (Skelcher & Smith, 2015; Suddaby et al., 2007). Finally, the dissertation makes empirical contributions by both exploring and testing the outcomes of the key variables used in this research among executives, directors, managers and employees of a diverse set of organizations (e.g. Burgers et al., 2009; Lepak et al., 2003) in multiple industries in the Rotterdam port region.

The results of the dissertation offer various management- and policy implications for firms that operate within port and industrial complexes. First, this dissertation highlights the

importance for firms to innovate beyond the technological domain in order to enhance innovation outcomes (Studies I, II and III). Second, in order to gain high innovation performance, it is necessary for firms to invest both strongly in a coherent combination of four SHR practices (flexible working roles, training and development, employee wellbeing and co-working) and high levels of R&D-investments in such a way that synergies between the two are maximized (Study I). Third, firms may need to create a workforce with a broad skill base, where employees can make their own decisions and where top-down rules and policies are implemented only to direct strategic boundaries (Study II). Last, firms should be aware that actors within hybrid partnerships can serve as powerful means to produce and reproduce institutional rules, practices or norms, all of which might lead to institutional change (Study III).

In conclusion, studying how and under which conditions, SHR practices can lead to enhanced innovation outcomes in organizations and regions provides critical insights for scholars and practitioners. Moreover, the dissertation provides a fertile ground for future research into human-centered innovation, which places employees as a central part within firms and regions.

Dutch summary
(Nederlandse samenvatting)

Om te kunnen floreren of te overleven in de steeds veranderende wereld is innovatie van cruciaal belang voor organisaties (Wang & Zatzick, 2019; Tidd & Bessant, 2018). De opkomst van nieuwe technologische ontwikkelingen zoals big data, FinTech, augmented reality, drones en kunstmatige intelligentie vergroten de bereidwilligheid van organisaties om in toenemende mate te investeren in innovatie. Hoewel onderzoek zich primair heeft gericht op de rol van technologie in het verbeteren van de innovatieprestaties van organisaties (Srivastava & Gnyawali, 2011; Sampson, 2007; Barge-Gil & López, 2014), groeit de belangstelling voor innovatie waar de mens centraal staat (bijv. Volberda et al., 2007; 2013; 2014; Damanpour & Aravind, 2012; Dhondt et al., 2015; Birkinshaw et al., 2008; De Jong & Den Hartog, 2010; Hamel, 2006). Organisaties die alleen investeren in technologie, maar niet investeren in de competenties en kennis van werknemers, zullen niet profiteren van nieuwe groeimogelijkheden.

Dit relatief recente innovatieonderzoek laat zien dat de sleutel voor nieuwe groeimogelijkheden sterk afhankelijk is van de kennis en competenties van werknemers (Damanpour, 2014; Walker et al., 2010; Hamel, 2006; Birkinshaw et al., 2008; De Jong & Den Hartog, 2010). Dit vereist veranderingen in werkwijzen, processen en structuren in organisaties (Birkinshaw et al., 2008) en het is daardoor essentieel om te investeren in nieuwe praktijken zoals in strategische human resource (SHR) praktijken. Uiteindelijk leiden investeringen in technologie alleen tot betere innovatieprestaties en productiviteitswinsten wanneer SHR-praktijken worden geïntroduceerd waar mensen leren hoe ze de nieuwe technologie kunnen toepassen (Ortega-Argilés, 2009). De manier waarop technologie wordt gebruikt en geïmplementeerd bepaalt immers de toegevoegde waarde die het creëert (Rees & Smith, 2017).

Dit proefschrift onderzoekt hoe en onder welke omstandigheden bepaalde SHR-praktijken kunnen bijdragen aan verbeterde innovatieprestaties in organisaties en regio's. Het proefschrift legt daarbij de focus op zowel de menselijke als de technologische aspecten van innovatie. De studies in dit proefschrift leveren belangrijke nieuwe inzichten in hoe organisaties en regio's hun innovatieprestaties en groeimogelijkheden kunnen vergroten door de mens centraal te stellen in het innovatieproces. De drie verkennende studies in dit proefschrift zijn uitgevoerd in een havengerelateerde context.

Studie I bestudeert de complementariteitseffecten tussen SHR-praktijken en R&D investeringen op innovatieprestaties van bedrijven. De studie constateert dat het vermogen om aanzienlijk te investeren in een samenhangende combinatie van vier SHR-praktijken (flexibele werkrollen, training en ontwikkeling, vitaliteit en samenwerking) en aanzienlijk te investeren in R&D, belangrijk zijn voor een verbetering van de innovatieprestaties van een organisatie. De voordelen zijn het grootst voor baanbrekende (game-changing) bedrijven die relatief veel investeren in zowel SHR-praktijken als in R&D. Studie II biedt nieuwe inzichten in twee SHR-praktijken, dit zijn een brede vaardighedenbasis van werknemers en empowerment van werknemers in relatie tot ambidexteriteit van een organisatie. De studie onderzoekt ook de modererende rol van een dynamische omgeving in deze relatie. De studie toont aan dat, vooral in zeer dynamische omgevingen, een brede vaardighedenbasis van werknemers een belangrijk aspect is om ambidexteriteit binnen een organisatie te bereiken. Studie III concentreert zich op één specifieke SHR-praktijk, namelijk samenwerking met meerdere belanghebbenden – gedefinieerd als hybride partnerschappen – in relatie tot institutionele verandering. De studie toont aan dat als partners in hybride partnerschappen uiteenlopende sociale en commerciële doelstellingen als paradoxaal kunnen interpreteren – dat wil zeggen, als tegenstrijdig maar onderling verbonden in plaats van als onverenigbaar, hybride partnerschappen in staat zijn om een geplande institutionele verandering te bereiken.

De bijdragen van dit proefschrift zijn als volgt. Ten eerste benadrukt dit proefschrift de disbalans die aanwezig is in de huidige innovatieliteratuur (Teece, 2010; Damanpour, 2014; Schiuma, 2017), waar de nadruk nog steeds ligt op technologische innovatie. Dit proefschrift gaat in op het belang van mensgerichte innovatie. Ten tweede draagt dit proefschrift bij aan de literatuur over SHR-praktijken (Chen & Huang, 2009; Collins & Clark, 2003; Delery & Doty, 1996) en benadrukt het proefschrift de waarde en het belang van menselijk kapitaal binnen organisaties en in havencomplexen. Ten derde gaat dit proefschrift in op hoe de actie en interactie van individuen kan leiden tot collectieve resultaten op macroniveau (Felin et al., 2015; Foss & Lindenberg, 2013; Grigoriou & Rothaermel, 2014). Op deze manier probeert dit proefschrift de kloof tussen micro- en macro-perspectieven in de management literatuur te verkleinen (Skelcher & Smith, 2015; Suddaby et al., 2007). Ten slotte levert het proefschrift empirische bijdragen door zowel de resultaten van de belangrijkste variabelen die in dit onderzoek worden gebruikt onder leidinggevenden, directeuren, managers en werknemers van diverse organisaties te onderzoeken en te testen (Lepak et al., 2003; Burgers et al., 2009) in meerdere sectoren in de Rotterdamse havenregio.

De bevindingen in dit proefschrift genereren verschillende managementimplicaties en beleidsimplicaties voor organisaties die actief zijn in haven- en industriële complexen. Ten eerste benadrukt dit proefschrift het belang voor organisaties om buiten het technologische domein te innoveren om succesvolle innovatieresultaten te behalen (Studies I, II en III). Ten tweede is het van belang dat organisaties, om succesvolle innovatieresultaten te behalen, zowel sterk investeren in een coherente combinatie van vier SHR-praktijken (flexibele werkrollen, training en ontwikkeling, welzijn van werknemers en samenwerking) en hoge niveaus van R&D investeringen zodat synergiën tussen de twee worden gemaximaliseerd (Studie I). Tevens is het van belang voor organisaties om te investeren in een personeelsbestand met een brede vaardighedenbasis en te investeren in empowerment van werknemers. Zo kunnen werknemers hun eigen beslissingen nemen en top-down regels en beleid worden dan alleen ingezet om strategische keuzes te maken (Studie II). Ten slotte moeten organisaties zich ervan bewust zijn dat partners binnen hybride partnerschappen kunnen dienen als krachtige middelen om institutionele regels of normen te produceren en te herproduceren, waardoor institutionele verandering kan ontstaan (Studie III).

Concluderend, het bestuderen van hoe en onder welke omstandigheden, bepaalde SHR-praktijken kunnen bijdragen aan verbeterde innovatieprestaties in organisaties en regio's, biedt belangrijke inzichten voor wetenschappers en mensen uit de praktijk. Dit proefschrift belooft een vruchtbare bodem te zijn voor verder onderzoek naar mensgerichte innovatie waar de mens als een centraal onderdeel wordt gezien binnen organisaties en in de maatschappij.

About the author



Renée Rotmans (born January 23rd, 1993, in Gouda, The Netherlands) completed her Bachelor of Science degree (Bsc) in International Business Administration and her Master of Science degree (Msc) in Strategic Management (cum laude) at the Rotterdam School of Management (RSM), Erasmus University in Rotterdam. She started her PhD-candidacy at the beginning of 2017 at RSM, Erasmus University in Rotterdam after having worked at the Erasmus School of Health Policy and Management as a junior researcher. Here she worked on a project at the Strategy Department of the Erasmus Medical Center on strategic cooperation in care, with special attention to the optimal positioning of the medical center in the region. On the 1st of May 2019, Renée continued her PhD-candidacy at the Department of Strategy and International Business at the Amsterdam Business School, University of Amsterdam, after her promotor Prof. Dr. Henk Volberda started working there.

Her research interests revolve largely around strategic human resource management, business model innovation, human-centered innovation, ambidexterity and institutional change. Renée's work was presented at several leading academic conferences such as the *Academy of Management* (Boston, 2019), *Strategic Management Society* (Paris, 2018; Minneapolis, 2019), *European Academy of Management* (Reykjavik, 2018; Lisbon, 2019), *European Group for Organization Studies* (Tallinn, 2018; Edinburgh, 2019), *International Association of Maritime Economists* (Athens, 2019) and *Air Transport Research Society World Conference* (Antwerp, 2017; 2018). She has also presented at more themed conferences such as the *16th World Conference Cities and Ports* (Quebec, 2018), *European Seaport Organization Annual Conference* (Brussels, 2018), *International Human Capital Group* (Rotterdam, 2019; Vancouver, 2019), *Port and City conference* (Delft, 2018), *Economic Board Zuid-Holland* (Den Haag, 2019) and *Smart Port Community Session* (Rotterdam, 2019). In November 2019, she received the ESPO award in Brussels, which was awarded by the European Commission. She also organized national and international seminars on human-centered innovation and was chairperson of the sub-theme 24 "challenging organizations from within: novel management practices and unsanctioned organizational change" of the *European Group for Organization*

Studies in 2018. Besides, she taught a course named 'Sustainable Strategies' three years successively with Dr. Frank Wijen at RSM, Erasmus University Rotterdam.

Renée's PhD research was supervised by Prof. Dr. Henk Volberda and Dr. Rick Hollen and was conducted in close cooperation with the Rotterdam Port Authority. The research was funded for two-third by the Rotterdam Port Authority and for one-third by Smartport. The papers Renée wrote were under review in academic peer-reviewed journals at the time of her PhD defense. Her studies are also published in a book chapter of ABP Report Magazine, in the EVR (Economische Verkenning Rotterdam) and in the LeerWerk Akkoord (Human Capital and Education Agreement). She is affiliated with the Department of Strategy and International Business at the University of Amsterdam, the Amsterdam Center for Business Innovation, the Human Resources department of the Port of Rotterdam Authority and Smartport.

Employees are the firm's most valuable asset. Employees are major contributors to innovation performance and worth of the firm. Next to investments in technology, firms, therefore, also need to invest in their employees. This demands alteration in firm processes and practices and requires investments in strategic human resource (SHR) practices, which should be integrated into the corporate strategy of firms to make sure that HR and technology become embedded in the business operations. In the end, investments in technology only lead to high innovation outcomes and productivity gains when people learn how to apply the new technology.

In this dissertation, the introduction of SHR practices is further outlined in the context of the Rotterdam port region, Europe's largest industrial and port complex. By studying the role of SHR practices to enhance innovation outcomes in organizations and regions, this dissertation attempts to understand in what way firms can obtain more value from employees and their skills, attitudes and behavior. This offers important new insights for scholars and practitioners into how firms, as well as, regions can increase their chances of survival and prosperity.

Renée Rotmans is an advisor of social innovation and labor affairs at the Port of Rotterdam Authority and a PhD candidate at the University of Amsterdam. She carried out exploratory research into human-centered innovation and examined more than 100 firms in the Rotterdam port region. Renée also studied the effectiveness of two initiatives that aimed to create institutional change: RISI (Rotterdam Initiative for Social Innovation) and Rotterdam Werkt (a network of firms in the Rotterdam region that work together on increasing labor mobility opportunities).