Minttu Laukkanen

SUSTAINABLE BUSINESS MODELS FOR ADVANCING SYSTEM-LEVEL SUSTAINABILITY

ACTA UNIVERSITATIS LAPPEENRANTAENSIS 889

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Supervisor Professor Janne Huiskonen
LUT School of Engineering Science
Lappeenranta-Lahti University of Technology LUT
Finland

Reviewers Associate Professor (tenure track), PhD Leena Aarikka-Stenroos
Industrial Engineering and Management
Tampere University
Finland

Associate Professor, PhD Fawzi Halila
School of Business and Engineering
Halmstad University
Sweden

Opponent Principal Scientist, Adjunct Professor, PhD Maria Antikainen
Business ecosystems, innovation, foresight
VTT
Finland

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Abstract

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Sustainability challenges call for changes at different levels and scales, and actions by all sectors of society, including business. Prior research has identified the central role corporate strategies, innovations, and business models play in the move towards sustainability. In recent years, the focus of corporate sustainability literature has extended from minimising the negative impacts to a more strategic view of how companies can create a positive impact on the environment and societies. However, the adoption of truly sustainable business practices and the evidence of the progress made towards sustainable development remain limited. This study integrates the views from the literature fields of the traditional business model, corporate sustainability, and system transition, and focuses on advancing system-level sustainability through sustainable business models.

This study concerns the bidirectional interaction between companies and the larger systems in which they operate. The study investigates companies' impact on system-level sustainability through the sustainable business model, and especially through sustainable value creation. It also examines how the system supports or hinders the adoption of sustainable value creation activities at company level. The study employed exploratory and qualitative research design by applying multiple research strategies and methods. The study was conducted through literature reviews, a multiple case study covering 20 companies, a Delphi study with 42 experts, a single in-depth case study, and design science research including multiple steps and covering an analysis of 20 sustainable business models and observations, interviews, and feedback from 34 attendees who participated in framework testing.

This study contributes to the sustainable business model literature by demonstrating that sustainable value creation, as a central element of a sustainable business model, is a vehicle through which companies have the potential to create sustainable business, and that advance system-level sustainability, and the understanding of value capture logic is a necessary driver for companies to engage in sustainable value creation. The study introduces frameworks and tools to create an understanding of the multifaceted nature of sustainable value creation and value capture potential. Further, the findings of the study highlight the role of both radical business model innovations and minor business model changes in advancing sustainability. This study also contributes to the sustainability transition literature by addressing the bidirectional interaction between company and

system levels. Companies play a central role in sustainability transition, but the adoption of sustainable business models requires system-level support.

Keywords: sustainable business model, sustainability, sustainable business, value creation, value capture, systemic change, sustainability transition

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Minttu Laukkanen
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Contents

List of publications

This dissertation is based on the following papers. The rights have been granted by publishers to include the papers in dissertation.

I. Laukkanen, M., and Huiskonen, J. (2019). Stakeholder conflicts in sustainable value creation: Framework for analysing business model choices towards sustainability from the value destruction perspective. *Proceedings of the 25th International Sustainable Development Research Society Conference*, 26-28 June 2019, Nanjing, China.

II. Laukkanen, M., and Huiskonen, J. (2018). Analysing business model choices and sustainable value capturing: A multiple case study of sharing economy business models. *Proceedings of the 20th International Conference on Business Sustainability*, 13-14 September 2018, Zurich, Switzerland.

III. Laukkanen, M., Manninen, K., and Huiskonen, J. (2019). Revealing the sustainable value creation and value capture potential with a multicapital approach. *Proceedings of the 4th International Conference on New Business Models*, 1-3 July 2019, Berlin, Germany.

IV. Laukkanen, M., and Patala, S. (2014). Analysing barriers to sustainable business model innovations: Innovation systems approach. *International Journal of Innovation Management*, 18(6).

V. Koistinen, K., Laukkanen, M., Mikkilä, M., Huiskonen, J., and Linnanen, L. (2018). Sustainable system value creation: Development of preliminary frameworks for a business model change within a systemic transition process. In: Moratis, L., Melissen, F., and Idowu, S. (eds) Sustainable business models: Principles, Promise, and Practice, pp. 105-127. Springer International Publishing. ISBN 978-3-319-73502-3

Author's contribution

Minttu Laukkanen is the first author of four publications and the second author of one. More detailed descriptions of the author's contributions are listed below.

Publication I: Minttu Laukkanen was the paper's principal author and investigator. The author designed the research plan with the co-author. The author collected and analysed the data, and wrote and revised the paper.

Publication II: Minttu Laukkanen was the paper's principal author and investigator. The author designed the research plan with the co-author. The author collected and analysed the data, and wrote and revised the paper.

Publication III: Minttu Laukkanen was the paper's principal author and investigator. The author was responsible for planning and coordinating the research process. The author conducted the literature review. The empirical data was jointly collected with the second author. The author analysed the data and wrote the paper. The author finalised and revised the paper in collaboration with the co-authors.

Publication IV: Minttu Laukkanen was the paper's principal author and investigator. The author was responsible for planning and coordinating the research process. The author collected the data. The analysis and conclusions were created in collaboration with the co-author. The author wrote and revised the paper jointly with the co-author.

Publication V: Minttu Laukkanen had the principal idea for the paper. The author developed the research plan with the co-authors. The author collected and analysed the literature jointly with the first author. The author drew the conclusions and wrote the paper with the first author. The paper was finalised and revised in collaboration with the co-authors.

1 Introduction

1.1 Research background

The world is faced with severe grand challenges (Ferraro et al., 2015), such as climate change, biodiversity loss, resource scarcity, and environmental degradation. An industrial revolution and human activity are affecting the Earth system's functioning to a degree that threatens the resilience of the whole system. Based on critical processes that regulate the Earth system's functioning, natural scientists have developed the planetary boundaries framework that defines the safe operating space for global societal development (Rockström et al., 2009; Steffen et al., 2015). Crossing these boundaries increases the risk of generating irreversible environmental change. For example, the impact of global warming relates to freshwater scarcity, decreased biodiversity, and changes in land and ocean ecosystems (IPCC, 2018). In addition to the protection of Earth's life-support system, there is increased demand for societal wellbeing, including reducing poverty, hunger, and inequality, improving health and wellbeing, respecting human rights, and creating sustainable production and consumption patterns (Griggs et al., 2013; Raworth, 2017). These grand challenges call for radical social and technological change (i.e. socio-technical change), and actions by all sectors of society, including business (Markard et al., 2012; Smith et al., 2005).

The significant role of companies in creating sustainable business and enhancing sustainability has recently been raised in corporate sustainability literature (Baumgartner and Ebner, 2010; Dyllick and Muff, 2016; Young and Tilley, 2006). Sustainability calls for new innovations at different levels and scales (Machiba, 2010). The key is to shift the focus from individual technological advances and incremental changes to creating entirely new systems, and more radical and systemic changes (Boons et al., 2013; Chesbrough, 2010; Johnson and Suskewicz, 2009; Qvist and Tukker, 2013; Silvestre and Ţîrcă, 2019; Smith et al., 2010; Sousa-Zomer and Cauchick Miguel, 2018). Business model innovations by companies are recognised as a key to the creation of sustainable business (Boons and Lüdeke-Freund, 2013; Carayannis et al., 2015: Long et al., 2018; Rossignoli and Lionzo, 2018). The business model is seen as an integrative framework for strategy execution (Casadesus-Masanell and Ricart, 2010; Richardson, 2008), i.e. the link between corporate strategy and business processes and daily operational activities (Al-Debei and Avison, 2010; Rauter et al., 2017). The business model emphasises a system-level approach to explaining how companies "do business" (Zott et al., 2011) and provides a link between an individual company and the larger production and consumption system to which it belongs (Boons et al., 2013).

The business model for sustainability, i.e. the *sustainable business model* (SBM), incorporates the three pillars of sustainability: economic, environmental, and social, the "triple-bottom-line" (TBL) (Elkington, 1998), as an integral part of the company's value proposition and value creation logic (Stubbs and Cocklin, 2008). For example, many traditional manufacturing companies have changed their business models from selling

products to selling services which have the potential to increase sustainability (Yang and Evans, 2019). Forestry companies have been updated, for example, with biomass-based products and biorefineries which can be integrated into the pulp and paper industry (Hämäläinen et al., 2011). Today, there is huge interest in business models based on circularity, saving resources, and eliminating waste (D'Amato et al., 2018; Pieroni et al., 2019), and new forms of consumption, for example, through sharing (Parente et al., 2018; Piscicelli et al., 2018).

As previously discussed, SBMs have the potential to create sustainable business and contribute to sustainable development goals. Additionally, from the business perspective, SBMs are recognised as important for long-term success (Lacy et al., 2012; Ritala et al., 2018). Sustainability is seen as a key driver of innovation activity (Lubin and Esty, 2010; Nidumolu et al., 2009). Furthermore, SBMs provide the conceptual link between sustainable innovation and the company's economic performance (Boons et al., 2013). Previous research has identified several drivers and motives for sustainability actions by companies. The core drivers for sustainability with a direct or indirect influence on the company's economic performance are costs and cost reduction, risk and risk reduction, competition and competitive advantage, increased sales and profit margin, reputation and brand value, attractiveness as an employer and employee satisfaction, customer preferences and satisfaction, and increased innovative capabilities and new market creation (Hockerts, 2015; Peloza and Shang, 2011; Rauter et al., 2017; Schaltegger et al., 2012). The most direct link between sustainability action and the company's economic performance may be the link between increased resource efficiency and decreased costs (Schaltegger et al., 2012). A better reputation and competitive advantage are seen as consequences of increased customer satisfaction (Saeidi et al., 2015). Attractiveness as an employer and the capability of innovating are drivers with a more indirect economic impact (Schaltegger et al., 2012). To understand how companies can benefit from sustainability requires attention not only to short-term outcomes but to capabilities developed over time, such as organisational resiliency (Ortiz-de-Mandojana and Bansal, 2016). Resilience refers to continuous improvement, low volatility, and strong viability, which help companies endure over the long term and through crises (ibid.). Additionally, personal and value-based motivations and organisational culture are identified as driving forces towards more SBMs (Rauter et al., 2017). Others adopt SBMs because it is the "right thing to do" (Bansal and Roth, 2000), and leadership and values are important aspects, as in any process of organisational change (Rauter et al., 2017).

However, the adoption of SBMs and the evidence of the progress made towards sustainable development are still limited (Dyllick and Muff, 2016). First, it seems that practitioners do not perceive business models in the same way as researchers, and there is no consensus about what SBMs mean (Rauter et al., 2017). The focus on shorter term business success has been the dominant performance measure, and the lack of sufficiently ambitious concrete goals has led to merely incremental improvements (Dyllick and Muff, 2016). In this thesis, the term *system-level sustainability* is used to describe the goal of a company aiming to create a sustainable business and contribute to sustainability. Following the definition of stronger sustainability (Williams and Millington, 2004),

system-level sustainability refers to conditions that enable a good quality of life that can continue for a long time and within ecological limits. System-level sustainability emphasises business impacts on wider society and natural capital (Schaltegger et al., 2016a), as well as the creation of positive benefits, not merely the minimising of the negative impacts at company level, which remains the view of sustainability in several companies.

Creating an SBM, or transitioning from a traditional business model towards sustainability, is likely to be a complicated and challenging process (Long et al., 2018). The implementation of SBMs requires strong change capabilities and a willingness to challenge the status quo (Chesbrough, 2010). Broader changes towards sustainability are challenging because sustainability is a collective good, which means that most sustainable solutions offer no direct user benefits (Geels, 2011), reflecting the classic case of the tragedy of the commons (Hardin, 1968). It is therefore unlikely that SBMs can overcome strong path dependencies and lock-ins, and replace existing business models without wider system-level changes (Bidmon and Knab, 2018) and the actions of not only businesses but governments, consumers, investors, and educators (Lacy et al., 2012). Path dependencies and lock-ins help to maintain consistency and stability, and keep companies on their at least previously successful tracks, but at the same time, they create systemic resistance to sustainability change. The broader adoption of SBMs therefore requires interaction between company and system levels.

The focus of the thesis is on advancing sustainable business and system-level sustainability, which requires new SBMs. Building on previous literature and practice, this thesis is motivated by the following observations: *SBMs have the potential to create sustainable business and contribute to sustainable development goals and, at the same time, promote the long-term competitive advantage of the company. However, this requires that companies understand complex concepts: the business model and sustainability; and the surrounding business environment supporting the adoption of SBMs. Furthermore, this requires interaction between the company and system levels.* This introductory chapter continues with a presentation of the research gaps, objectives, and questions. It then presents the conceptual positioning and articulates the key concepts of the thesis. Finally, it presents an outline of the rest of the thesis.

1.2 Research gaps, objectives, and research questions

The business model literature has traditionally focused on how companies create value for customers, capture value itself, and enhance competitiveness (Chesbrough, 2007; Osterwalder and Pigneur, 2010; Teece, 2010; Zott et al., 2011), and corporate sustainability literature has traditionally focused on companies' internal activities, such as sustainable supply chain management (Harms et al., 2013; Wolf, 2014), sustainability performance measurement (Goyal et al., 2013; Searcy, 2012), and reporting sustainability actions (Brown et al., 2009; Hedberg and Von Malmborg, 2003; Milne and Gray, 2013). Recently, the focus has extended from creating customer value to creating value for

multiple stakeholders (Geissdoerfer et al., 2018; Schaltegger et al., 2016a) and minimising the negative impacts on a more strategic view of how companies can create a positive impact on the environment and societies through sustainability strategies (Baumgartner and Ebner, 2010), sustainability-oriented innovations (Adams et al., 2016), and SBMs (Bocken et al., 2014). Both researchers and practitioners agree that businesses need to become sustainable, and prior research has identified the central role that business models play in the move towards sustainability (Lüdeke-Freund and Dembek, 2017; Roome and Louche, 2016). The first SBM research appeared in the 21st century, and since 2010, research and practice related to SBMs have grown dynamically. However, several research gaps have still been identified.

First, an integrated business sustainability perspective which investigates all TBL dimensions is still relatively new. SBM studies focus either on socioeconomic or environmental sustainability, with some focusing on both (Lozano, 2018). The lack of concrete goals, the dynamic and multidimensional features of SBMs, and negative consequences make assessment especially challenging (Hahn et al., 2015; Lee et al., 2012; Rauter et al., 2017). Most studies do not consider tensions, trade-offs, and conflicts between different aspects, such as TBL performance goals, a different timeframe, and stakeholder interests (Geissdoerfer et al., 2018; Morioka et al., 2018a). More research is needed on how to define and assess the value-creation potential and impact of SBMs (Evans et al., 2017; Hofmann, 2019), as well as their negative features (e.g. rebound effects) and how to address negative feedback loops (Geissdoerfer et al., 2018; Köhler et al., 2019). Against this background, the first research gap addresses the sustainability impacts of SBMs, i.e. companies' impact on system-level sustainability. This requires a deeper understanding of sustainable value creation, including its positive as well as negative aspects.

Companies are interested in SBMs, but businesses have yet to achieve large-scale sustainability. More knowledge is needed on the sustainability impacts of SBMs, but also on enablers for creating sustainable business and adopting SBMs. More research is needed on companies' key barriers and drivers in adopting SBMs (Hannon et al., 2013): for example, how different actors enhance SBM implementation (Abdelkafi and Täuscher, 2016), how societal value might be translated into economic value for the company (Loorbach and Wijsman, 2013), or how the value proposition and sustainable value created for stakeholders and captured by the company can reinforce each other (Abdelkafi and Täuscher, 2016). The second research gap involves enabling conditions for business model changes towards sustainability, i.e. the role of business environment and multiple stakeholders in enhancing the transition to more SBMs, as well as impacts on companies' economic performance.

A common theme related to identified research gaps (e.g. considering SBM assessment and drivers of and barriers to SBM innovations or SBM theory development) is the lack of a true systemic perspective (Bocken et al., 2019; Freudenreich et al., 2019). Although the business model concept has been presented as the bridge between company-level corporate sustainability and system-level changes towards sustainable development, the

business model literature remains largely dominated by organisational-level analyses and examples, and neglects the link with developments at the systemic level (Abdelkafi and Täuscher, 2016; Bidmon and Knab, 2018; Dyllick and Muff, 2016; Gorissen et al., 2016; Hellström et al., 2015; Pedersen et al., 2018). Similarly, existing business model tools and frameworks are rarely sustainability-driven and tend to neglect the systemic and dynamic perspective (Geissdoerfer et al., 2018, Groen and Walsh, 2013; Biloslavo et al., 2018). Transition research, which considers the systemic perspective, in turn, has neglected the micro-level dynamics and the role of single companies (Bidmon and Knab, 2018; Köhler et al., 2019; Markard et al., 2012). Overall, research on the transition to sustainability is still a less visible field in the established management studies journals (Markard et al., 2012). Further research is needed on how strategies of companies impact the outcome of sustainability transitions (Farla et al., 2012), and the role companies play in sustainable innovation and transitions (Iñigo and Albareda, 2016). In conclusion, there is a strong call for an integration of business research with transition research to better understand the interrelations between business models and transitions towards sustainability (Bidmon and Knab, 2018; Bocken et al., 2019; Geels, 2014; Köhler et al., 2019; Loorbach, 2010; Loorbach and Wijsman, 2013; Markard et al., 2012). This thesis responds to this call by integrating SBM research, which is typically based on traditional business model and corporate sustainability research (Bocken et al., 2014; Evans et al., 2017; Morioka et al., 2018a), with the views of systemic change and system transition research.

The thesis explores two interconnected research gaps, which emphasise the bidirectional interaction between companies and the larger systems in which they operate (Geels, 2014), and contributes to both SBM and sustainability transition research. Companies impact the system level through their business models by creating (or destroying) value. At the same time, the system supports or hinders the adoption of sustainable value creation activities at company level. Figure 1 presents the research motivation, the addressed research gaps, the publications of this thesis and their connection with SBM research through sustainable value creation, and the motivation to create sustainable value and sustainability transition research through the roles companies and systems play in the transition to sustainability.

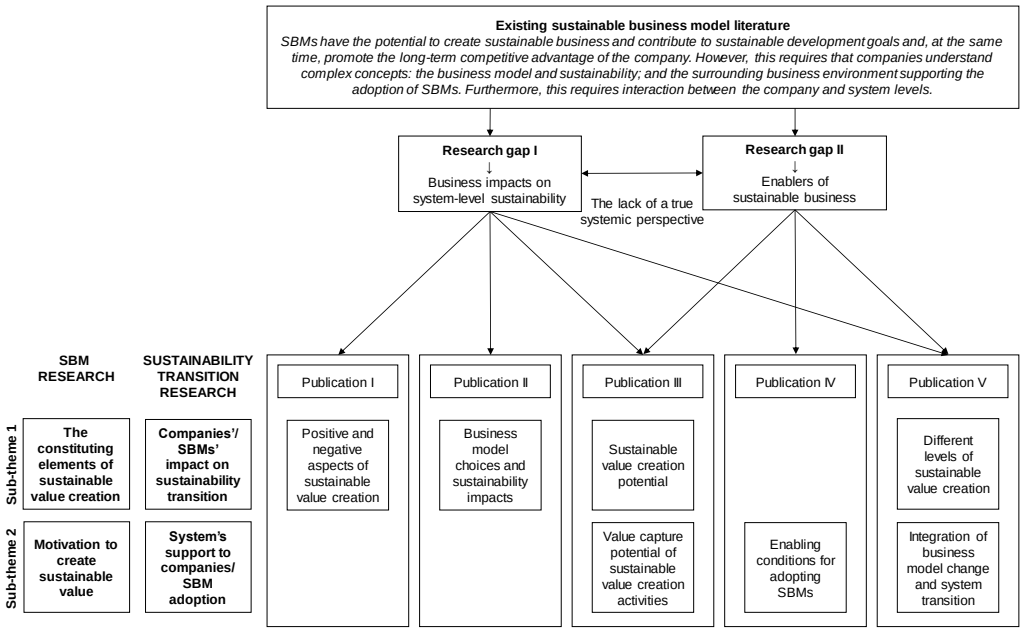

Figure 1. The research gaps addressed in this thesis and its publications

To address the research gaps, the main objective of the thesis is to bridge the gap between the company and system levels, and increase the understanding of the company's activities in enhancing sustainable business and enabling sustainability transition. The research question guiding the research is:

How is system-level sustainability advanced through sustainable business models?

This question concerns the bidirectional interaction between companies and the larger systems in which they operate. Following the two addressed interconnected research gaps, this overall objective can be divided into two sub-themes: 1) the business impacts on system-level sustainability; and 2) the enablers of sustainable business. These sub-themes are guided by two sub-questions (SQs), and further divided into sub-topics, which are dealt with in the individual publications:

SQ1: How do companies affect system-level sustainability through SBMs and specifically, through sustainable value creation?

The first research sub-theme considers sustainable value creation (the central part of any SBM) as a vehicle to increase system-level sustainability. Publications I, III, and V define what sustainable value creation should mean; Publications I and III also propose how sustainable value creation should be assessed and Publication II investigates how business model choices affect sustainable value creation.

SQ2: What motivates companies to shift their business models towards system-level sustainability and the creation of sustainable value?

The second research sub-theme considers enabling the conditions for business model changes towards system-level sustainability and companies' motivations in adopting sustainable value creation activities. Publication III explains how companies can translate sustainable value created for the other stakeholders into captured value for themselves; Publications IV and V take a broader system-level perspective and explain how a wider socio-technical transition could support business change towards sustainability. The research sub-themes and sub-topics, research questions, objectives, and publication information are listed in Table 1.

Table 1. Research sub-themes and sub-topics, research questions, and objectives

Research sub-theme	Research sub-topic	Research question(s)	Objective(s)	Publ.
Business impacts on system-level sustainability	Positive and negative aspects of sustainable value creation	How do customers and other stakeholders perceive the value of SBMs, and how should the creation of sustainable value be assessed?	To reveal potential indirect effects and stakeholder conflicts leading to value destruction instead of sustainable value created	I
Business impacts on system-level sustainability	Business model choices and sustainability impacts	How do business model choices affect sustainable value created and value captured?	To explain the relationships between business model choices and sustainable value created/captured	II
Business impacts on system-level sustainability; Enablers of sustainable business	Sustainable value creation and value capture potential	What is sustainable value creation and capture potential, why should sustainable value creation activities be adopted, and how should the creation and capture of sustainable value be assessed?	To explain the value capture potential of sustainable value creation activities	III
Enablers of sustainable business	Enabling conditions for adopting SBMs	What are the key barriers to SBM innovation, and how can societal change towards SBMs be promoted?	To identify the barriers to SBM innovation and explore how the innovation system can overcome them	IV
Business impacts on system-level sustainability; Enablers of sustainable business	Company and system level changes towards sustainability	How the business model concept can bridge company level corporate sustainability and system level sustainability transition?	To explain both the business model change at company level and the wider socio-technical transition to sustainability	V

1.3 Conceptual background

In this section, the central concepts of the thesis are defined. Furthermore, the section clarifies their foundations and interrelations, and positions the research. Figure 2 presents the theoretical foundations of this thesis: *traditional business model* research; *corporate sustainability* research; and *system transition* research. It also presents the key theoretical concepts of the thesis: *sustainable business model*; *sustainable value creation*; *sustainability transition*; *sustainable business*; and *system-level sustainability*. It also illustrates the research's conceptual positioning.

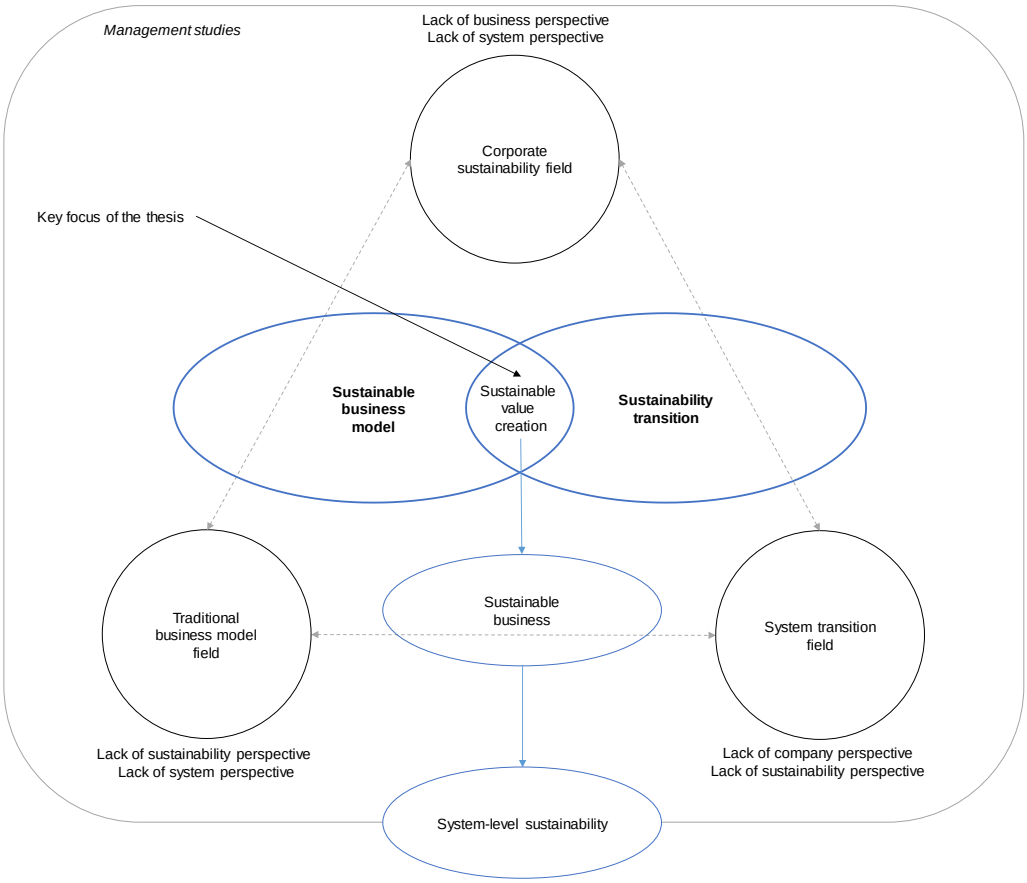

Figure 2. Conceptual positioning of the thesis

SBM research has emerged from the flaws in existing research fields: the traditional business model literature lacks integrated sustainability and system perspectives; the corporate sustainability literature lacks integrated business (e.g. value capture logics) and system perspectives; and the system transition literature lacks integrated company and sustainability perspectives. Academic interest in SBMs is relatively recent, but it is an emerging field of research and has already resulted in a rich body of work which is itself

starting to create a research stream (Lüdeke-Freund and Dembek, 2017). SBM research and practice have been seen as a sub-field within existing research fields, such as the traditional business model and the corporate sustainability field, or as a stand-alone field, but today, the emerging research and practice on SBMs forms an integrative field that depends on and at the same time transcends established fields. This thesis adopts such an integrative approach to SBMs. Besides SBM research, it contributes to sustainability transition research, which is similarly an integrative field of research. Systemic change, i.e. transformative change (Gorissen et al., 2018), is considered in the system transition literature. The global challenge of sustainability is increasingly understood in terms of transitions to more sustainable socio-technical systems (Smith et al., 2010) or the large-scale societal transformation to sustainability (Loorbach et al., 2017) leading to the "sustainability transition" research stream. Companies are important actors with their sustainability strategies and SBMs in sustainability transition (Bolton and Hannon, 2016; Wittmayer et al., 2017).

This thesis focuses on companies' actions in advancing sustainable business and system-level sustainability through SBMs. Business models are especially a concern in management studies, which creates the foundation for this thesis. Contextually, this thesis focuses mainly on for-profit business models. The sustainable business model, and sustainability transition, as well as other key concepts: sustainable value creation, sustainable business and system-level sustainability, and their interrelations are discussed in more detail in the following sub-sections. The corporate sustainability, traditional business model, and system transition literatures, which form the theoretical basis for this thesis, are discussed in more detail in Section 2.1.

1.3.1 **Sustainable business and system-level sustainability**

Traditionally, businesses' sole purpose has been to maximise shareholder value (Friedman, 1970). Today, businesses have alternative objectives, ranging from pure profit maximisation to social welfare maximisation (Lankoski and Smith, 2018). Some companies' main goal is to create sustainable business and advance sustainability (Van Marrewijk, 2003). *Sustainable business*, also referred to as corporate sustainability, is about translating the general principles of sustainable development into business practice (Azapagic, 2003; Dyllick and Hockerts, 2002). To integrate sustainability targets with the strategy, the business model and operations require that companies clearly understand the meaning and relevance of sustainable development, and the concept of sustainability (Rauter et al., 2017). The terms "sustainable development" and "sustainability" are often used interchangeably (Sikdar, 2003; Williams and Millington, 2004). Sustainability can be understood as the target goal, and sustainable development as a holistic approach and temporal process for achieving it (Shaker, 2015). Sustainable development is formally defined as the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). It is referred to as balancing economic development, environmental stewardship, and societal equity – "TBL" (Sikdar, 2003). However, sustainable development as defined by the Brundtland Commission is too general to be operationalised by executives (Rauter et al., 2017). In recent SBM and

corporate sustainability studies, sustainable development is concretised through the sustainable development goals (SDGs) of the UN 2030 agenda for sustainable development (Ferro et al., 2019; Morioka et al., 2018a), planetary boundaries (Rockström et al., 2009; Whiteman et al., 2013), and the four sustainability principles (Broman and Robért, 2017; Robèrt et al., 2012). These systemically and scientifically defined goals ensure a company's journey towards true or strong sustainability (Upward and Jones, 2016) and justify the business. Building on the definition of stronger sustainability (Williams and Millington, 2004), the term *system-level sustainability* is used in this thesis to describe the goal of a company aiming to create economic and social value, while protecting the natural environment and reducing environmental pollution (Brehmer et al., 2018).

1.3.2 Sustainable business model and sustainable value creation

Sustainable business model (SBM) emerges as a vehicle to systematically integrate corporate sustainability principles into core business and deliver the necessary shift towards sustainable business (Lüdeke-Freund and Dembek, 2017; Morioka et al., 2018b). The concept of the SBM has its origins in traditional business model literature combined with corporate sustainability literature. Variations of the term have also been used, such as sustainability business model (Stubbs and Cocklin, 2008), business model for sustainability (Abdelkafi and Täuscher, 2016; Long et al., 2018; Schaltegger et al., 2016a), green business model (Nair and Paulose, 2014; Sommer, 2012), flourishing/strongly sustainable business model (Upward and Jones, 2016), and more sustainable business model (Lozano, 2018). The first conceptual definitions of the SBM only emerged in 2013 (Boons and Lüdeke-Freund, 2013). Previously, the SBM has been linked, for example, to the Global Warming Potential footprint (Svensson and Wagner, 2011), services and product-service systems (Anttonen, 2010; Halme et al., 2007), and closed material loops and selling performance instead of selling products (Stahel, 2007). Today, the definitions in the literature have in common that they see SBMs as modifications of the traditional business model concept, with principles or goals that aim for sustainability (Geissdoerfer et al., 2018). SBMs create significant positive and/or significantly reduced negative impacts for the environment and/or society through changes in the way the organisation and its value network create, deliver, and capture value or change their value propositions (Bocken et al., 2014). The SBM is an important instrument for enhancing sustainable business and further macro-level sustainable development, i.e. system-level sustainability, but it is not an end in itself (Boons and Lüdeke-Freund, 2013). Therefore, this thesis considers *sustainable value creation*.

An essential part of any business model is the value creation, delivery, and capture mechanisms that are employed (Teece, 2010; Roome and Louche, 2016; Yang et al., 2017a). Sustainability calls for new business models, as well as a redefinition of the concepts of value (Oskam et al., 2018; Roome and Louche, 2016). In SBM research, the concept of sustainable value creation is now central to the discussion (Bocken et al., 2013; Evans et al., 2017; Jensen et al., 2019). While a traditional business model aims mainly to create use value for customers, an SBM aims to align business goals with the needs of

an ecosystem and society translated into multiple value concepts, e.g. increased prosperity and wellbeing at societal level (den Ouden, 2012; Morioka et al., 2018a). The concept of sustainable value builds on an integrated view of value from the perspectives of economics, ecology, sociology, and psychology (den Ouden, 2012). Sustainable value creation is about creating multiple value forms for but also with multiple stakeholders (Baldassarre, 2017; Bocken et al., 2013; 2015; den Ouden, 2012; Schaltegger et al., 2017), referring to value cocreation (Freudenreich et al., 2019; Sulkowski et al., 2018). Following the definition of sustainability, sustainable value creation refers not merely to positive benefits but to eliminating or reducing negative impacts (Van Bommel, 2018; Roome and Louche, Tura et al., 2018; Yang et al., 2017b). Research on value creation can be divided into two streams: value creation processes and value outcomes (Gummerus, 2013). Within this research, the former considers the business model choices and company's attempt to increase value; the latter considers how value is perceived by multiple stakeholders. As the SBMs aim to create value for multiple stakeholders, such as ecosystem- and society-level actors, companies play a broader strategic role in affecting system-level sustainability (Sulkowski et al. 2017).

1.3.3 **Sustainability transition**

Business model innovations towards system-level sustainability are difficult to achieve. Sustainable development as well as system-level sustainability are global, macro-level concepts, and sustainable value creation covers multiple perspectives: environmental, social, and economic dimensions; temporal and spatial differentiation; multiple stakeholders; and both positive and negative impacts. SBMs have the potential to create sustainable business and advance system-level sustainability, but on the other side, companies' activities to create SBMs are greatly affected by the socioeconomic environment in which they operate (Zott and Amit, 2007). All these aspects call for a systemic approach. *Systemic change* (or system-level change or transformative change) is defined as "the result of actions that lead to a significant alteration within a system, potentially leading to substantial impacts" (Clarke and Crane, 2018, p. 308). From the company perspective, studies on systemic change may focus on: the companies' and other actors' actions that lead to systemic change; the systemic change and the role of companies and other actors in that change; the impacts of the change and the systemic changes that lead to them; the overarching issue and how it relates to any of these steps; or the institutional environment and how it relates to any of these steps (Clarke and Crane, 2018). This thesis focuses quite broadly on the different aspects of systemic change.

The term transition, which is used in many disciplines, is also referenced to describe systemic change; it refers to a non-linear shift from one dynamic equilibrium to another. The term *sustainability transition* is used to refer to large-scale societal changes aimed at solving grand challenges (Loorbach et al., 2017). According to Markard et al. (2012, p. 956), "sustainability transitions are long-term, multidimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption". Several characteristics are linked to sustainability transitions, such as multidimensionality and co-evolution; the multi-actor

process; the relationship between stability and change; long-term goals and process; open-endedness and uncertainty; and values, contestation, and disagreement (Köhler et al., 2019; Markard et al., 2012). Transitions are coevolutionary processes, entailing multiple interdependent developments and involving changes in a range of elements: technologies; markets; user practices; cultural meanings; infrastructures; policies; industry structures; business models; and supply chains. Transitions are executed by a range of actors and social groups that have their own resources, capabilities, and strategies, as well as beliefs, interests and values, so different actors also tend to disagree about the most desirable innovations and transition pathways for sustainability transitions (Köhler et al., 2019). These aspects indicate the transdisciplinary nature of the research on sustainability transitions.

1.3.4 Summary of the key concepts

Because the emerging SBM field to which this study contributes integrates views from different research fields – corporate sustainability, business model, and system transition – it is necessary to define the key terms applied in the research. Table 2 combines the key concepts of the thesis and explains how they are defined and interrelated. The list of key concepts reflects the fact that the thesis has its roots in multiple disciplines: the natural sciences (e.g. sustainability); management sciences (e.g. business model, corporate sustainability); and social sciences (e.g. transition). The concepts are discussed in more depth in Chapter 2, which concerns the theoretical background of this thesis.

"Systemic change" and "transition" are used interchangeably in this thesis. Systemic change or system-level change is discussed in the literature on sustainable business, while the term transition is used to describe the same phenomenon in the literature on sustainability transitions. It should also be noted that the terms related to business model – value creation, value created, value capture, and value captured – are used slightly differently in separate publications. Each publication has been written at a different time, and SBM research has developed rapidly in recent years. During these years, a need for more precise definitions of value concepts has emerged. The different value concepts related to the SBM are discussed in Section 2.2.1.

Table 2. The key concepts of this thesis and their corresponding definitions

Key Concept	Definition
Sustainable development	Sustainable development refers to an economic, environmental, and social development that meets the needs of the present and does not prevent future generations from fulfilling their needs (WCED, 1987).
Sustainability; System-level sustainability	Sustainability is a target goal, whereas sustainable development is a process for achieving it (Shaker, 2015). In this thesis, the concept of *system-level sustainability* is used to describe the final goal of a company aiming to create sustainable business. System-level sustainability refers to conditions that enable a good quality of life that can continue for a long time and within ecological limits. Companies aiming to create sustainable business and advance system-level sustainability create economic and social value, while protecting the

	natural environment and reducing environmental pollution (Brehmer et al., 2018). In practice, this means respecting planetary boundaries (Rockström et al., 2009) and sustainability principles (Robèrt et al., 2012), and targeting the SDGs (United Nations, 2019).
Sustainability principles	Building on natural sciences, sustainability (which is the target goal) can be concretised in four sustainability principles. Underpinned by scientific laws and knowledge, there are four basic principles for a sustainable society in the biosphere: In a sustainable society, nature is not subject to systematically increasing… 1. …concentrations of substances extracted from Earth's crust; 2. …concentrations of substances produced by society; 3. …degradation by physical means; and in that society; 4. while people are not subject to conditions that systematically undermine their capacity to meet their needs (health, influence, competence, impartiality, meaning-making) (Broman and Robért, 2017; Robért, 2012).
Corporate sustainability	Corporate sustainability is about translating the general principles of sustainable development into business practice (Azapagic, 2003; Dyllick and Hockerts, 2002). The aim is to incorporate environmental, social, and economic aspects into a company's strategic decision making and create positive long-term effects on society (Baumgartner and Ebner, 2010).
Sustainable business	Corporate sustainability is also referred to as sustainable business (Dyllick and Muff, 2016; Young and Tilley, 2006) to emphasise a business-centred approach to sustainability.
Business model	A business model describes the rationale of how an organisation creates, delivers, and captures value (Osterwalder and Pigneur, 2010). It reflects the company's realised strategy (Casadesus-Masanell and Ricart, 2010), and provides a link between an individual company and the larger production and consumption system of which it is part (Boons et al., 2013).
Value creation	Value creation consists of two main streams: *value creation processes*, which refer to expected value or a company's attempt to increase value (including the activities and resources involved in the value creation process), and *value outcomes*, which consider how value is actually perceived by the beneficiaries (Chesbrough et al., 2018; Gummerus, 2013).
Value capture	Value capture represents the value that the company generates for itself from its value proposition and value creation activities (Abdelkafi and Täuscher, 2016; Geissdoerfer et al., 2018).
Business model innovation	Business model innovation refers to the conceptualisation and implementation of new business models (Geissdoerfer et al., 2018). Business model innovation is closely linked to business model change (Lambert and Davidson, 2013).
Sustainable business model	The SBM creates significant positive and/or significantly reduced negative impacts for the environment and/or society through changes in the way the company and its value network create and deliver value, and capture value or change their value propositions (Bocken et al., 2014). The SBM covers the economic, environmental, social, and time dimensions (Lozano, 2018), and it aims to frame the system in whose boundaries it operates (Bocken et al., 2019).
Change	According to the Business Dictionary (2019), "change" means "to make something different". The term "change" is used as an overarching concept for all terms that describe something that becomes different, such as development or transition.
Transition	Transition, i.e. systemic change, refers to a non-linear shift from one system state to another. Transition is the result of actions and an interplay of a variety

	of changes, at different levels and in different domains, which somehow interact with and reinforce each other to produce a fundamental change in a societal system, e.g. a fundamental change in policy or significant change in system attributes or function (Clarke and Crane, 2018; Loorbach et al., 2017).
Sustainability transition	Sustainability transition refers to a long-term, multidimensional, and fundamental transformation process through which established socio-technical systems shift to more sustainable modes of production and consumption (Markard et al., 2012).

1.4 Outline of the thesis

The thesis comprises two main parts: a summary of the thesis; and five individual, complementary publications. The outline of the thesis is presented in Figure 3. Part I begins with an introduction, which presents the research background and identifies research gaps, objectives, and the research questions of the thesis. Chapter 2 introduces the theoretical background of the thesis: research foundations, sustainable business models, and systemic change theories in sustainability management. Chapter 3 details the research approach and methodological choices. Chapter 4 summarises the individual publications by focusing on the objectives, key findings, and contributions. Chapter 5 concludes Part I by presenting the main contributions of the thesis, implications for managers and policymakers, and the limitations of the research, and by providing suggestions for future research. Part II comprises the individual publications, each providing different perspectives on the main research topic.

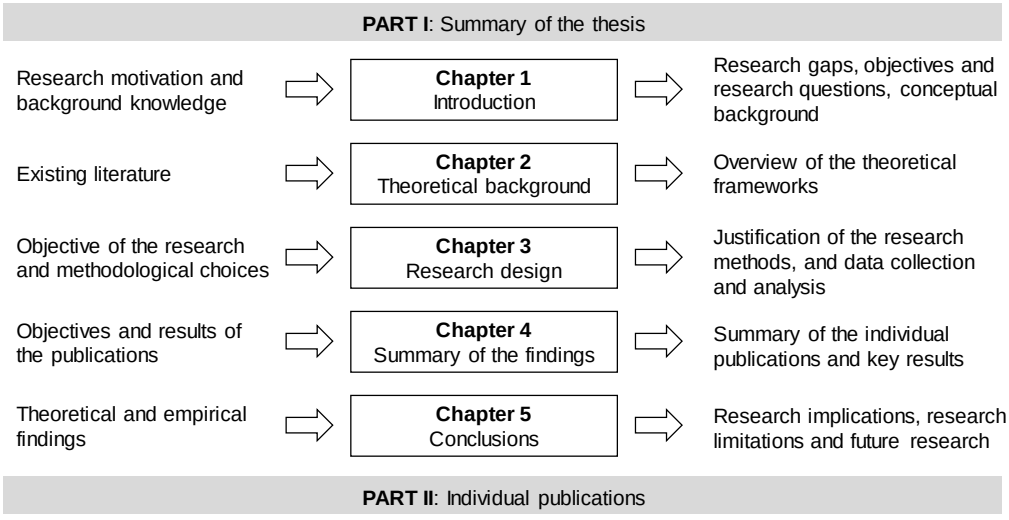

Figure 3. Outline of the thesis

2 Theoretical background

This chapter, consisting of four main sections, details the theoretical background of the thesis. The first section discusses the foundations for and the research fields that have applied in this thesis. The second section focuses on reviewing the relevant SBM literature, which forms the primary theoretical background for this thesis. This section begins with a sub-section concerning the definition of the SBM, followed by a sub-section discussing sustainable value propositions, sustainable value creation and delivery, and value capture, which are the key concepts related to the SBM. Furthermore, the necessary business model changes for advancing sustainability are discussed. The SBM section ends with a sub-section summarising the different SBM types. The third section focuses on systemic change theories in the management literature and the context of SBMs, and it details the background to the theories utilised in each publication. Finally, the fourth section summarises the theoretical background and presents the theoretical framework of this thesis.

2.1 Sustainable business model research as an integrative field

As an integrative field – the view adopted in this thesis – SBMs are seen as vehicles for responding to the world's increasing ecological and social problems, and assisting all types of company to make them business sustainable (Lüdeke-Freund and Dembek, 2017). This thesis has its foundations in the *corporate sustainability*, *traditional business model*, and *system transition* fields, as presented in Figure 4 and discussed in the following.

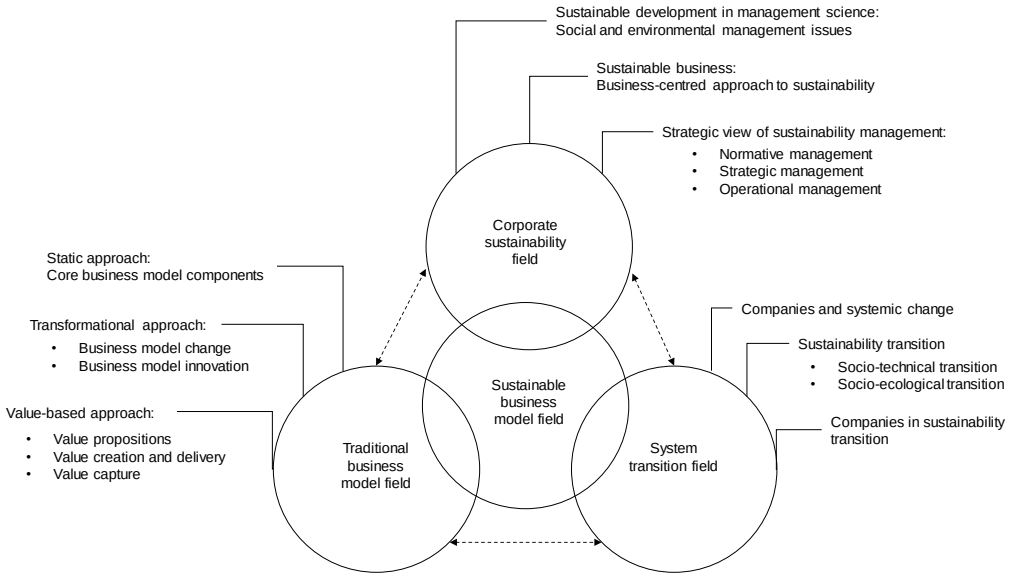

Figure 4. SBM research as an integrative field (adapted from Lüdeke-Freund and Dembek, 2017)

The concept of sustainable development was introduced about thirty years ago, and the consideration of sustainability in the management literature has grown quickly since the 1990s (Linton et al., 2007; Zemigala, 2019). Research on sustainable development in management science is related to several topics (Zemigala, 2019), for example, supply chain management (Seuring and Müller, 2008), environmental management (Melnyk et al., 2003), and corporate social responsibility (CSR) (McWilliams and Siegel, 2001). In the twenty-first century, the concept of *corporate sustainability* (CS) has emerged to refer to social and environmental management issues (Linnenluecke and Griffiths, 2010; Van Marrewijk, 2003; Montiel, 2008). Furthermore, the concepts of sustainable business (Dyllick and Muff, 2016; Young and Tilley, 2006) and business sustainability (Ferro et al., 2019; Svensson et al., 2018) have been adopted to emphasise a business-centred approach to sustainability. Corporate sustainability considers how the macro-level concept of sustainable development can be applied to the business level (Baugartner and Ebner, 2010; Dyllick and Hockerts, 2002). It refers to activities to incorporate environmental and social concerns in business operations, and in interactions with stakeholders (Van Marrewijk and Werre, 2003). From the strategic perspective, sustainability issues should be integrated into different management levels: normative; strategic; and operational (Baumgartner, 2014; Breuer and Lüdeke-Freund, 2017). Normative management refers to the general aim, principles, and norms of the company, and is expressed through vision, mission, and corporate values. Developing a corporate sustainability strategy is part of the strategic level; the strategy implementation in the different corporate functions is part of the operational level. The SBM is designed at the strategic management level, aiming to translate sustainability strategy into the operational level.

Likewise, the *business model* concept has flourished in the management literature since the end of the 1990s, especially with the emergence of the Internet and rapid advances in Information and Communication Technologies (Al-Debei and Avison, 2010; Demil and Lecocq, 2010; Hedman and Kalling, 2003; Shafer et al., 2005). The term "business model" has been misinterpreted and misused over the years. For example, it is confused with other popular terms in the management literature such as strategy, business concept, revenue model, and economic model (DaSilva and Trkman, 2014). A business model is neither a strategy nor simply a revenue model, but it is the link between the strategy and operational levels (Al-Debei and Avison, 2010; Rauter et al., 2017; Shafer et al., 2005), and it performs both value capture, i.e. the revenue model, and value creation (Chesbrough, 2007; Zott et al., 2011). Today, the common understanding of the business model is that it describes the rationale of how an organisation creates, delivers, and captures value (Biloslavo et al., 2018; Osterwalder and Pigneur, 2010; Teece, 2010). Such a value-based approach provides a more concrete definition of a business model and has been successfully used in various contexts (Carayannis et al., 2015; Morioka et al., 2018a). Business models are defined by their building blocks: value proposition (product/service, customer segments, and relationships); value creation and delivery (key activities, resources, technologies, partners, etc., as well as the distribution of value among stakeholders); value capture (cost structure and revenue streams); and the interaction between these elements (Geissdoerfer et al., 2018; Morioka et al., 2018a;

Richardson, 2008; Rossignoli and Lionzo, 2018). Business models target novel ways of creating, delivering, and capturing value which challenge the basis of competition (Nidumolu et al., 2009). As business models are considered the link between corporate strategy and day-to-day business operations, their integration into sustainability requires the integration of sustainability issues into corporate strategy, i.e. developing and implementing corporate sustainability strategy (Rauter et al., 2017).

Business model research covers various themes. Two different uses of the term "business model" can be noted. The first is the static approach, which describes the core business model components and their coherence; the second refers to a more transformational approach, using the concept as a tool for addressing change and innovation (Demil and Lecocq, 2010; Lambert and Davidson, 2013). The latter focuses on business model change: the motivation for change; the key factors in successful change; and the overall conceptualisation and implementation of new business models (Geissdoerfer et al., 2018; Lambert and Davidson, 2013). The degree of business model change is directly linked to the degree of innovation (Cavalcante et al., 2011). Incremental changes refer to the (re-)defining of an existing business model to correspond to the principles of sustainability, for example, through increased energy efficiency or dematerialisation (Rauter et al., 2017). These incremental changes are significant, but they are insufficient when the world is facing many simultaneous sustainability challenges (Boons et al., 2013; Johnson and Suskewicz, 2009). A systemic view of SBM innovation is essential to foster more radical changes to sustainability (Adams et al., 2016; Machiba, 2010; Quist and Tukker, 2013).

Systemic change, i.e. transformative change (Gorissen et al., 2018), is considered in the *system transition* literature. The global challenge of sustainability is increasingly understood in terms of transitions to more sustainable socio-technical systems (Smith et al., 2010) or large-scale societal transformation towards sustainability (Loorbach et al., 2017) leading to the "sustainability transition" research stream. Many transition researchers have adopted a socio-technical approach to studying transitions (ibid.). Socio-technical transitions involve a broad range of actors (individuals, companies, other organisations) and institutions (norms, regulations, standards) and far-reaching changes along different dimensions (material, technological, organisational, institutional, political, economic, and socio-cultural) (Markard et al., 2012). Furthermore, Loorbach et al. (2017) link socio-technical transitions with technological innovation systems and innovation studies, and history and technology sciences, and distinguish two other perspectives in studying transitions: the socio-institutional and the socio-ecological. The socio-institutional perspective refers to approaches that draw from the social sciences (sociology, governance, policy, economics, geography, political science) to understand systemic changes in complex societal systems. It emphasises the role of governance and politics, as well as institutional and cultural change. The socio-ecological approach has its roots in biology, ecology, and resilience theory, and it focuses on the interplay between ecological transitions and socio-ecological systems. It emphasises analyses of ecological thresholds and system vulnerability (ibid.). "Transition" and "transformation" are often used interchangeably, but transformation originates in the literature on socio-ecological systems (Clarke and Crane, 2018). The underlying motivation for researching

sustainability transition stems from grand challenges and the exploration of the path to more sustainable societies (Köhler et al., 2019). The research field of sustainability transition has developed in the last two decades and expanded rapidly in the last ten years (Köhler, 2019; Markard, 2012).

Today, the research on sustainability transitions covers nine main themes: 1) understanding transitions; 2) power, agency, and politics in transitions; 3) governing transitions; 4) civil society, culture, and social movements in transitions; 5) businesses and industries in sustainability transitions; 6) transitions in practice and everyday life; 7) the geography of transitions – spaces, scales, places; 8) ethical aspects of transitions – distribution, justice, poverty; and 9) reflections on methodologies for transitions research (Köhler et al., 2019). These research themes are connected with others, for example, research on businesses and industries in sustainability transitions is connected with politics (2) or social movements (4) (ibid.). Companies act as important actors in sustainability transition (Farla et al., 2012; Wittmayer et al., 2017) by developing novel technologies, products, services, and business models, creating new value networks, lobbying for specific policies, influencing customer behaviour, and shaping entire industries (Köhler et al., 2019). Research in businesses and industries in sustainability transitions has so far addressed three main topics: the role of companies in creating novel technologies and new innovation systems, and re-orientating industries; the role of companies in facilitating institutional change; and the relations between incumbent actors and new entrants (ibid.). Sustainability transition research has focused primarily on the decarbonisation of energy systems (Markard et al., 2012), but recent articles also cover mobility (Canitez, 2019), agriculture/food security (Kuokkanen et al., 2018), waste management (Gorissen et al., 2016), urban development, buildings, and cities (Gorissen et al., 2018; Loorbach and Wijsman, 2013), conceptual approaches to the role of companies (Almeida and Melo, 2017; Delmas et al., 2019), and new business models in sustainability transitions (Sarasini and Linder, 2018).

2.2 Sustainable business models

Academic interest in SBMs is relatively recent, but there is growing interest in the interaction of sustainability and the business model. Figure 5 summarises the business and management articles that consider sustainability and the business model by year. Although there has been a steady increase in SBM publications, few studies have theoretically defined or characterised the SBM term. In most cases, the term is simply applied (Lozano, 2018).

In 2008, Stubbs and Cocklin offered the first attempt to conceptualise an SBM. They maintained an SBM draws on the economic, environmental, and social aspects of sustainability in defining a company's purpose and measuring its performance, considers the needs of all stakeholders, treats nature as a stakeholder, and encompasses both a system- and company-level perspective. Boons and Lüdeke-Freund (2013) further presented normative requirements for an SBM through the elements of a generic business

model concept: value proposition; supply chain; customer interface; and financial model. Sustainable value proposition provides measurable ecological and/or social value besides economic value. These values are balanced, and temporally and spatially determined, reflecting a dialogue between business and society. Sustainable supply chain management covers active engagement with suppliers and common sustainability practices, for example, waste reusage and closed-loop material cycles, based on the idea that the entire supply chain includes the focal company's socio-ecological burden. The focal company does not shift its own socio-ecological burdens to its customers but finds ways to motivate them to take responsibility for their consumption. The financial model accounts for the company's economic, ecological, and social impacts and reflects an appropriate distribution of economic costs and benefits among the actors involved in the business model.

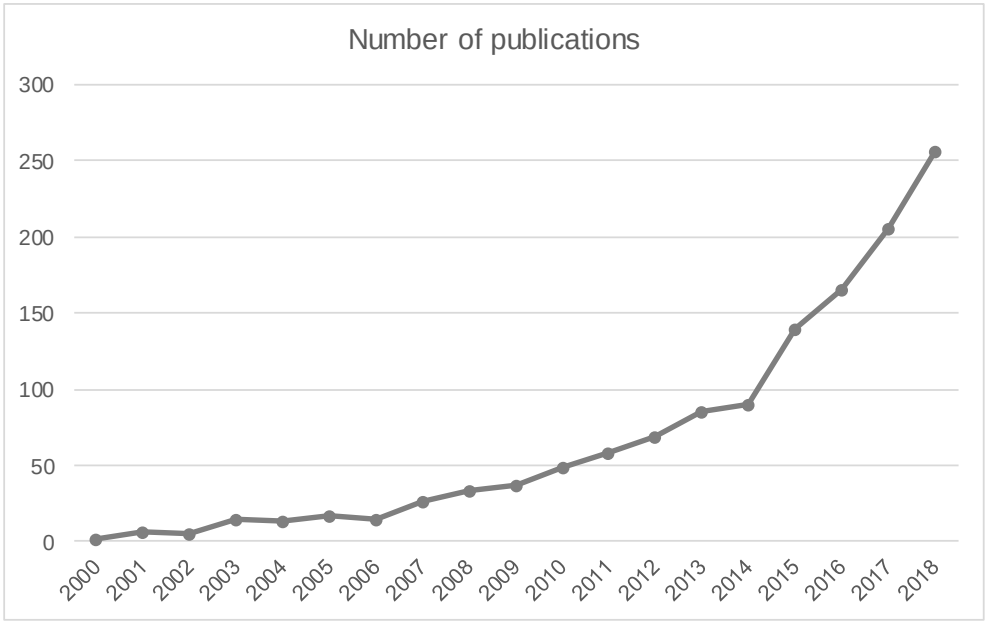

Figure 5. Publications on the Scopus database that include the terms "business model" and "sustainab*" in title, abstract, or keywords

In 2014, Bocken et al. defined SBMs as innovations that create significant positive or significantly reduced negative impacts for the environment and/or society through changes in the way the organisation and its value network create, deliver, and capture value or change their value propositions. To date, this is perhaps the most commonly adopted SBM definition in the management literature. The definition sees the SBM as a modification of the traditional business model concept, with certain additional objectives and characteristics, which are common within the SBM definitions (Geissdoerfer et al., 2018). Bocken et al. (2014) and many other scholars (e.g. Abdelkafi and Täuscher, 2016; Evans et al., 2017; Oskam et al., 2018; Roome and Louche, 2016) build their definitions

on general value concepts related to the business model: value proposition; value creation and delivery; and value capture. Compared to traditional business models, they consider social and ecological value, as well as economic value. However, although some studies on SBMs claim to be based on the TBL, most focus on one or two dimensions, or the definitions are based on a narrow business-oriented perspective of value proposition, creation, and delivery in the first place (Lozano, 2018). Bocken et al. (2014) emphasise multiple stakeholders by linking the value creation process to the value network, and value outcomes to impacts on the environment and society. The multi-stakeholder perspective is common to almost all SBM definitions: Abdelkafi and Täuscher (2016) mention "various stakeholders and the natural environment"; Schaltegger et al. (2016a) speak of "customers and all other stakeholders"; Evans et al. (2017) discuss "multiple stakeholders including the natural environment and society as primary stakeholders" and "mutual value creation". The multi-stakeholder and TBL views call for a system-level perspective. SBMs aim to create greater positive environmental and societal value overall, thus optimizing the value for themselves, as well as for a wider network of stakeholders, including society and the environment (Abdelkafi and Täuscher, 2016; Roome and Louche, 2016).

Additionally, the SBM definition of Bocken et al. (2014) includes both positive value creation and a consideration of negative impacts. Being aware of value destruction is as important to an SBM as the creation of positive benefits for the company and society (Roome and Louche, 2016). Upward and Jones (2016) have presented a more theoretical approach, which is built on the natural and social science of sustainability. They discuss weak and strong sustainability, and compare more profit-oriented business models to strongly SBMs. They see strongly SBMs not as harming but creating positive environmental, social, and economic value throughout their value network, thereby sustaining the possibility that human and other life can flourish on this planet for ever. Strongly SBMs take financial, societal and environmental costs into account, and measure financial rewards, social benefits, and environmental regeneration – the "tri-profit". The selected SBM definitions are presented in Table 3. This thesis adopts the SBM definition of Bocken et al. (2014), with some additional specifications. First, this study considers the time dimension, which is missing in many SBM definitions (Lozano, 2018). Second, this study aims to explain more concretely what the positive or negative impacts for the environment and/or society are. Third, this study aims to frame the context and understand the system in whose boundaries an SBM operates.

Table 3. Selected SBM definitions

Source	Definition
Stubbs and Cocklin, 2008	SBM draws on the economic, environmental, and social aspects of sustainability in defining a company's purpose and measuring its performance, considers the needs of all stakeholders, treats nature as a stakeholder, and encompasses both system- and company-level perspectives.
Bocken et al., 2014	"Business model innovations for sustainability are defined as: Innovations that create significant positive and/or significantly reduced negative impacts for the environment and/or society, through changes in the way the organisation and its value-network

	create, deliver value and capture value (i.e. create economic value) or change their value propositions." (p. 44)
Abdelkafi and Täuscher, 2016	"A business model for sustainability (BMfS) aims at creating value for various stakeholders and the natural environment. . . . They incorporate sustainability as an integral part of the company's value proposition and value creation logic. As such, BMfS provide value to the customer and to the natural environment and/or society." (pp. 74-75)
Roome and Louche, 2016	The process of sustainable value creation is central to any SBM. Sustainable value creation refers to a broader understanding of value, taking more than just economic forms of value into account, as well as value destruction avoided not just value created by the new business model.
Schaltegger et al., 2016a	"A business model for sustainability helps describing, analysing, managing, and communicating (i) a company's sustainable value proposition to its customers, and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organisational boundaries." (p. 4)
Upward and Jones, 2016	Strongly SBMs do no harm but create positive environmental, social, and economic value throughout their value network, thereby sustaining the possibility that human and other life can flourish on this planet for ever.
Evans et al., 2017	SBMs embed economic, environmental and social flows of value that are created, delivered, and captured in a value network. They require: 1) a system of sustainable value flows among multiple stakeholders, including the natural environment and society as primary stakeholders; 2) a value network with a new purpose, design, and governance; 3) a systemic consideration of stakeholder interests and responsibilities for mutual value creation.
Morioka et al., 2018a	"An SBM is a representation of business elements, their interrelations and the systemic context that enable sustainable value exchange with stakeholders towards corporate sustainability performance, translating and providing feedback between corporate strategy and operations. . . . SBMs are challenged to create and deliver not only financial value, but rather a so called sustainable value." (pp. 724-725)
Geissdoerfer et al., 2018	SBMs "incorporate pro-active multi-stakeholder management, the creation of monetary and non-monetary value for a broad range of stakeholders, and hold a long-term perspective" (pp. 403-404).
Long et al., 2018	"BMfS aim to provide products or services that directly or indirectly reduce the pressure on society and the environment while still generating profits equal to or greater than traditional business." (p. 86)
Lozano, 2018	"A holistic and systemic reflection of how a company operationalizes its strategy, based on resource efficiency (through operations and production, management and strategy, organisational systems, governance, assessment and reporting, and change), so the outputs have more value and contribute to sustainability more than the inputs (with regard to material and resources that are transformed into products and services, economic value, human resources, and environmental value). The business model is affected by the company's resources (tangible and intangible), the supply chain and the company's stakeholders (internal, interconnecting and external), including the environment (inside and outside the company)." (p. 1164)
Morioka et al., 2018b	SBMs systematically integrate corporate sustainability principles (including economic, environmental, and social goals, the multi-stakeholder perspective and long-term outlook) into the core business.
Oskam et al., 2018	An SBM "consists of: a 'value proposition', providing ecological and/or social value next to economic value to its customers and other stakeholders; 'value creation and delivery', explaining how value is created and delivered by the company and its

	partners for all stakeholders; and 'value capture', maintaining or regenerating natural, social, and economic capital beyond its organisational boundaries" (p. 556).

2.2.1 Sustainable value creation and value capture

Business models and SBMs are commonly considered a combination of the following value concepts: *value proposition*; *value creation and delivery*; and *value capture* (e.g. Morioka et al., 2018a; Rossignoli and Lionzo, 2018). Conventionally, value proposition reflects the company's promise of how it will serve its customers (Patala et al., 2016). Customer value propositions are defined as statements of the benefits of a particular product or service, and these often refer to direct economic benefits, such as cost reduction, improved performance, and usability (Osterwalder and Pigneur, 2010; Patala et al., 2016). Within SBMs, an effective value proposition should communicate the sustainable value, i.e. the environmental and/or social benefits, of the offering besides the customer value (Kristensen and Remmen, 2019; Patala et al., 2016). SBMs propose sustainable value, but in practice, the value can be either created and captured or destroyed (Bocken et al., 2013; 2015; Roome and Louche, 2016). The main focus in this thesis is therefore on sustainable value creation and value capture, as well as value propositions. In the following, the different value concepts related to the business model are discussed. Table 4 summarises the differences between value, value creation, value capture, and value destruction and further, the differences between a profit-first business model and the SBM.

The concept of "sustainable value creation" (Evans et al., 2017; Morioka et al., 2018a; Yang et al., 2017a; 2017b) or "societal value creation", referring to both society and nature (Baumgartner and Rauter, 2017), has come to the fore in the SBM discussion. In the management literature, the first explicit statements about "sustainable value" related to social and/or environmental sustainability are found in 2003, when Hart and Milstein developed a sustainable value framework that linked the challenges of global sustainability to the creation of the company's shareholder value. In *Ecological Economics* in 2004, Figge and Hahn introduced a new "sustainable value added" approach to measure corporate contributions to sustainability.

From a purely economic perspective, the two most common notions of value are use value and exchange value (Bowman and Ambrosini, 2000; Lepak et al., 2007; den Ouden, 2012). Use value refers to different intangible elements, such as the specific quality of a new product or service, as subjectively perceived by users in relation to their needs. This view has been promoted especially by service researchers (e.g. Vargo et al., 2006). Exchange value refers to the monetary amount realised at the point of sale. In business, it has been most relevant to analyse value from the customer's perspective. This is traditionally understood through customer-perceived benefits vs sacrifices (Ulaga and Eggert, 2006; Woodall, 2003) or quality vs price (Grewal et al., 1998). Customer value is, however, a narrow definition of value, and the focus has recently shifted increasingly towards larger systems of stakeholders and various environmental, social, and

psychological perspectives of value (Peltola et al., 2016; den Ouden, 2012). Environmental value refers to business's impacts on the natural environment and environmental capital (Stubbs and Cocklin, 2008); social value includes elements that individuals or society in general consider valuable, such as health, happiness, and belonging, which are often also linked to psychological value elements (den Ouden, 2012). More concretely, these sustainable values refer, for example, to lower emissions, biodiversity, community development, equality and diversity, health and safety, and resilience and wealth (Evans et al., 2017). The multi-stakeholder perspective on value is central to the SBM: the aim is to create value for a larger group of stakeholders, including the natural environment and human beings with whom we will probably never engage (Bocken et al., 2015; Schaltegger et al., 2017).

Table 4. Different value concepts related to business model

		Profit-first business model	**Sustainable business model**
Value		Use value and exchange value	Multiple forms of value from different perspectives: economics, ecology, sociology, and psychology
Value creation	*Value creation process (i.e. value creation potential)*	Companies aim to create use value for customers	Companies aim to create multiple forms of value for multiple stakeholders, and avoid and/or reduce value destruction, i.e. negative impacts
	Value outcome (i.e. value created)	Use value perceived by customers/customer benefits/value for money	Multiple forms of value, i.e. benefits, perceived by multiple stakeholders, e.g. users (value for money, eco-footprint, happiness), business ecosystem actors (stability, sustainability, reciprocity) society (prosperity, the liveability of the environment, wellbeing), nature
Value capture	*Value capture potential*	Use value perceived by customers translated into monetary terms, i.e. exchange value; may also include intangible benefits, e.g. brand value	Multiple forms of value perceived by multiple stakeholders translated into monetary terms, as well as environmental and social impacts, and other intangible benefits
	Value captured	Realisation of exchange value/the amount of exchange value; profit is the only end objective	Realisation of multiple forms of value, e.g. profit, eco-effectiveness, social responsibility; profit is one of the end objectives, or social/ ecological wellbeing is the only end objective
Value destruction		Lost shareholder value	Damage to the planet, people, and profits

Research on value creation consists of two main streams: value creation processes that consider the activities and resources involved; and value outcomes that consider how the value is perceived by the beneficiaries (Gummerus, 2013). Furthermore, value creation

potential refers to the expected value or a company's attempt to increase value (Chesbrough et al., 2018), while value created refers to actual value outcomes, i.e. the positive benefits delivered to users and other stakeholders. While the profit-first business model aims mainly to create use value for customers, perceived as value for money (Bowman and Ambrosini, 2000), the SBM aims to create different types of value for different stakeholders (Freudenreich et al., 2019), translated into multiple value concepts, such as increased society level prosperity and wellbeing (den Ouden, 2012). Generally, sustainable value creation is understood through TBL (Evans et al., 2017; Montabon et al., 2016; Oskam et al., 2018; Patala et al., 2016), with different emphases. In recent studies, the focus has shifted from a purely instrumental view (Hart and Milstein, 2003) to a more integrative view of sustainable value (den Ouden, 2012, Evans et al., 2017), and the creation of positive impacts (Bocken et al., 2019; Dyllick and Muff, 2016) and benefits (Evans et al., 2017; Patala et al., 2016; Sulkowski et al., 2018), or the minimisation of negative impacts (Bocken et al., 2019).

Furthermore, value creation and value capture should be viewed as distinct processes; the company that creates value may or may not be able to capture the value in the long run (Lepak et al., 2007), but the company cannot capture value without creating it. The value capture represents the value that the company generates for itself from its value proposition and value creation activities (Abdelkafi and Täuscher, 2016), such as decreased costs or increased profits, brand value, and social and environmental responsibility (Engert et al., 2016; Saeidi et al., 2015; Schaltegger et al., 2012). Value capture can also be divided into value capture potential and value captured in reality. Many previous studies have focused on "does it pay to be green?" and have identified individual causal links between corporate sustainability activities and a company's economic performance (Klassen and McLaughlin, 1996; Melnyk et al., 2003). However, the value capture of sustainable value creation activities is a multidimensional and complex process. It requires attention to interactions among multiple stakeholders, as well as long-term outcomes (Ortiz-de-Mandojana and Bansal, 2016; Sulkowski et al., 2018). A systemic and integrative approach that systematises and structures all, not just individual, unidirectional links is required (Lankoski, 2008; Saeidi et al., 2015; Schreck, 2011).

However, what is profitable for one company, benefits one stakeholder, or increases value in one dimension of sustainability may not be profitable for another company or may destroy value from another stakeholder's perspective or in another dimension of sustainability (Van Bommel, 2018; Lankoski, 2008; Yang et al., 2017b). Being aware of value destruction is as important to the SBM as the creation of positive impacts (Roome and Louche, 2016). Value destruction includes the negative outcomes of the business, i.e. damage to the planet, people, and profits, such as rebound effects, greenhouse gas emissions, resource scarcity, biodiversity loss, unemployment, neglect of health and safety, unfair competition, and inequality and job losses (Bocken et al., 2019; Yang et al., 2017b). Thus far, most research on SBM innovations and sustainable value creation has focused on designing sustainable value propositions (Baldassarre et al., 2017; Kristensen and Remmen 2019; Patala et al., 2016) and how business models create ecological and

social benefits, but much less attention has been paid to the possible negative consequences and conflicts business models may cause among multiple stakeholders and perceived value outcomes (Biloslavo et al., 2018). In the corporate sustainability literature, there has been growing interest in tensions in sustainability (Hahn et al., 2010; Van der Byl and Slawinski, 2015), which describe situations where economic, environmental, and social values cannot be achieved simultaneously, and increased value in one dimension of sustainability can cause decreased value in another. The success of SBMs depends on the company's ability to consider, resolve, and manage tensions and conflicting sustainability values (Van Bommel, 2018).

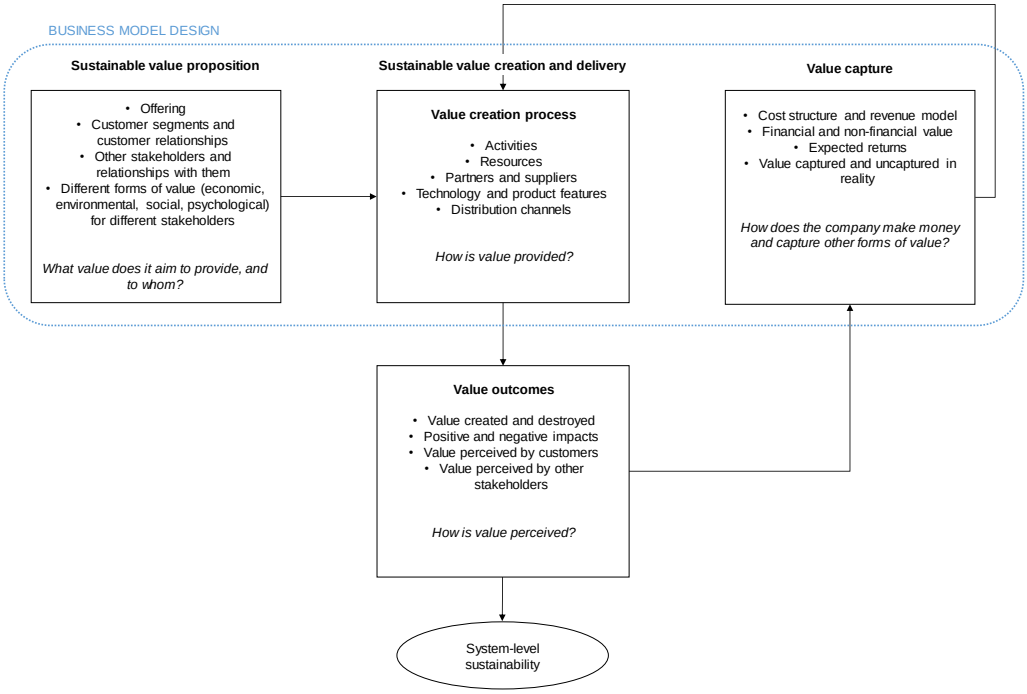

Figure 6. Different value concepts related to SBM (modified from Bocken et al., 2015)

Figure 6 presents a modified version of a widely accepted framework for business models, which consists of three blocks: value proposition; value creation and delivery; and value capture (Bocken et al., 2015). A sustainable value proposition describes the value the company aims to create. Furthermore, the value creation process describes how value is provided, and value outcomes describe how value is perceived by different stakeholders. An understanding of sustainable value creation is essential for targeting system-level sustainability; an understanding of value capture logic is vital for the successful implementation and diffusion of SBMs. Recognising the value capture potential motivates companies to create sustainable value, and captured value motivates companies to create even more sustainable value, leading to a virtuous circle (Casadesus-Masanell

and Ricart, 2011). If the value creation process does not lead to desired outcomes (related to system-level sustainability and value captured by the company), changes in the business model will be necessary. A deeper understanding of sustainable value creation is the central objective of this thesis. Sustainable value creation and value capture are investigated from different perspectives in Publications I, II, III, and V.

2.2.2 Business model changes for sustainability

The innovations required for system-level sustainability are linked to higher levels of business model innovation and more radical business model changes (Boons et al., 2013; Johnson and Suskewicz, 2009; Long et al., 2018; Pedersen et al., 2018). "SBM innovation" or "business model innovation for sustainability" refers to the conceptualisation and implementation of SBMs (Geissdoerfer et al., 2018). The economic, environmental, and social value of a product or technology or service remains latent until it is somehow commercialised or distributed via a business model. The same product or technology or service commercialised or distributed in two different ways will yield two different value outcomes (Chesbrough, 2010). Business model innovation covers changes from incremental adjustments to more radical and systemic changes. Various authors (e.g. Cavalcante et al., 2011; Gauthier and Gilomen, 2016; Geissdoerfer et al., 2018; Lubin and Esty, 2010; Schaltegger et al., 2012) have presented different types of business model change linked to the different degrees of business model innovation.

Lubin and Esty (2010) describe four stages of value creation, where the degree of innovation moves from stage one to stage four. These four stages are: "do old things in new ways"; "do new things in new ways"; "transform core business"; and "new business model creation and differentiation". From a sustainability perspective, the first stage might mean pollution prevention, cleaner production, and eco-efficiency improvements, whereas the second stage highlights designing products, entire processes, and systems for the environment, such as a "zero waste" commitment. At the third stage, shifting from a traditional energy business to solar energy solutions can be seen as an example. At the highest stage, companies see sustainability as a real business opportunity and source of differentiation. Companies will translate sustainability challenges into business opportunities by making "business sense" of societal and environmental issues (Dyllick and Muff, 2016; Machiba, 2010). This represents a very different strategic approach to business where the traditional "inside-out" approach is replaced with an "outside-in" approach (Dyllick and Muff, 2016).

Following the degrees of business model change by Schaltegger et al. (2012), Gauthier and Gilomen (2016) classify four types of business model transformation: "business model as usual"; "business model adjustment"; "business model innovation"; and "business model redesign". The typology establishes a direct link between business model change and the degree of innovation. It also reflects different types of sustainability strategy (Baumgartner and Ebner, 2010; Long et al., 2018; Schaltegger et al., 2012). "Business model as usual" refers to a case where the company is participating in delivering sustainable value without changes in its current business model, which reflects

an inactive sustainability strategy (Long et al., 2018). There is no motivation to gain competitive advantage with sustainability performance, but merely to comply with legal and other external standards concerning sustainability aspects to avoid risks for the company (Baumgartner and Ebner, 2010; Long et al., 2018; Schaltegger et al., 2012). "Business model adjustment" means marginal modifications in one (or a minor number of) business model element(s), which does not include the value proposition. Both business model adjustment and business model adoption (Schaltegger et al., 2012), which refer to a situation in which the business model is changed to mirror a competitors' changes, reflect a reactive sustainability strategy (Long et al., 2018). Reactive strategies can be divided into internal and external approaches. Within the internal approach, reactive strategic behaviour is often a reaction to increased costs, and the focus is on eco-efficiency and internal measures (Baumgartner and Ebner, 2010; Schaltegger et al., 2012). In the external approach (also referred to as the promotional sustainability strategy), the focus is mainly on reputation, which increases the risk of green-washing. "Business model innovation" (or business model improvement) refers to simultaneous changes and improvements in a major number of business model elements and new value propositions. Business model revision (Cavalcante et al., 2011) also falls under this category. Revision modifies the existing business model by removing something and replacing it with new processes. For example, the transition from old to new technology means revising the core standardised processes. Business model innovation or revision requires more fundamental changes, and can be considered a more radical innovation reflecting active sustainability strategy, when sustainability is considered a market opportunity and driver of innovation (Long et al., 2018). "Business model redesign" means changes in the underlying business logic, a complete rethinking of business model elements, and radically new value propositions. Proactive sustainability strategies (Long et al., 2018; Schaltegger et al., 2012) integrate sustainability into the core business logic and the core of the business model to contribute to sustainable development.

Three further special types of business model change or innovation can be identified: business model extension; business model creation; and business model termination (Cavalcante et al., 2011; Geissdoerfer et al., 2018). Business model extension means adding activities to an existing business model and changing working practices without affecting existing business processes. Business model acquisition is a kind of business model extension. It refers to acquiring new business models and integrating them into the company. Business model creation refers to the development of an entirely new business model. In such situations, there are no previous standardised processes. Business model termination refers to the abandonment of existing processes by closing down a business area. The synthesis of different types of business model changes is presented in Table 5.

A dynamic business model should be capable of both running existing activities and reacting to changes in the environment by adjusting, improving, redesigning, or creating an entirely new business model (Cavalcante et al., 2011). Business model innovations are vitally important for long-term success, but they are very difficult to achieve (Chesbrough, 2010). There are several challenges during the business model innovation process, such as uncertainty, lack of knowledge, skills and resources, stakeholders'

resistance, a lack of support from the wider system (e.g. government), external events, such as an economic crisis, and path-dependency, referring to lock-in mechanisms, which keep companies on their existing (and previously successful) path, but then make it difficult for companies to adopt new operations (Cavalcante et al., 2011; Long et al., 2018). This thesis focuses on business model change towards sustainability from three different perspectives. Publications I and II focus on business model change from the company perspective; these studies investigate how companies advance sustainability through business model changes. Publication IV investigates how the socio-technical system enables SBM innovation. Publication V integrates company level business model changes into the system-level sustainability transition.

Table 5. Synthesis of types of business model change (Baumgartner and Ebner, 2010; Cavalcante et al., 2011; Gauthier and Gilomen, 2016; Geissdoerfer et al., 2018; Long et al., 2018; Schaltegger et al, 2012)

Type	Description
Business model as usual	No changes in business model elements
Business model adjustment	Marginal modifications in one (or a minor number of) business model element(s), which do not include the value proposition
Business model adoption	The business model is changed to mirror competitor's changes, mainly focusing on matching competitors' value propositions
Business model innovation (or improvement or revision)	Simultaneous changes and improvements in a major number of business model elements; new value propositions
Business model redesign	Changes in underlying business logic; complete rethinking of business model elements; radically new value propositions
Business model extension (or acquisition)	Adding activities to an existing business model without affecting the existing business processes; acquisition refers to integrating a new business model into the company
Business model creation	The development of an entirely new business model (sustainable start-up)
Business model termination	Terminating existing processes

2.2.3 Different types of sustainable business model

In general, the existing literature discusses four major groups of business model type as examples of SBMs: 1) product-service systems (PSSs) (Gaiardelli et al., 2014; Tukker, 2004; 2015, Yang and Evans, 2019); 2) circular business models (Lewandowski, 2016; Lüdeke-Freund et al., 2019; Manninen et al., 2018; Ranta et al., 2018a; Urbinati et al., 2017); 3) sharing business models (Acquier et al., 2017; Frenken and Schor, 2017; Habibi et al., 2017; Muñoz and Cohen, 2017; Parente et al., 2018); and 4) social business models (Agafonow and Donaldson, 2015; Ashraf et al., 2019; Seelos and Mair, 2005; Yunus et al., 2010). The origin of PSSs lies in the servitisation of manufacturing (Vandermerwe and Rada, 1988). It is argued that selling the use of products instead of the products themselves leads to better utilisation of resources and is therefore a way to improve environmental sustainability, as well as increase economic benefits. Sustainability

potential is associated with increased resource and energy efficiency, and reduced carbon emissions, increased recycling, remanufacturing and reuse, increased product usage, dematerialisation, longer product life, better fulfilment of customer needs, stronger customer relationships, differentiation, increased revenues, access to service data, reduced ownership responsibility for customers, improved technology, reduced risk, and reduced lifecycle costs (Yang and Evans, 2019). Recent discussion has focused increasingly on the concepts of the circular and sharing economies as approaches for creating sustainable value. Circular business models aim to enhance the transition from a traditional linear and unsustainable "take-make-dispose" economy to a circular and sustainable "reduce-reuse-recycle" economy by slowing, closing, and narrowing resource loops (Bocken et al., 2016). The six major circular business model types are: repair and maintenance; reuse and distribution; refurbishment and remanufacturing; recycling; cascading and repurposing; and organic feedstock (Lüdeke-Freund et al., 2019). The sharing economy is also seen as a potential new pathway to sustainability (Heinrichs, 2013). Sharing business models aims to maximise the utilisation of resources and avoid over-consumption (Frenken and Schor, 2017; Parente et al., 2018), and change consumer habits by encouraging the adoption of a collaborative form of consumption (Muñoz and Cohen, 2017). For example, the sustainability benefits derived from car sharing are not limited to the optimisation of vehicle utility, but additional benefits are that an optimal number of miles may be travelled by using a shared car, and sharing may lead to new friendships. Social business models aim to create solutions for sustainability problems by focusing on social value maximisation rather than profit maximisation for shareholders (Yunus et al., 2010). Publication II focuses on sharing business models as examples of SBMs. Otherwise, this thesis focuses mainly on for-profit business models in general and excludes social business models from the discussion.

The existing literature also describes more detailed sub-categories, archetypes (Bocken et al., 2014; Ritala et al., 2018; Yang and Evans, 2019), taxonomies (Lüdeke-Freund et al., 2018), or typologies (Lüdeke-Freund et al., 2019) for SBMs. The SBM archetypes, groupings of mechanisms and solutions that may contribute to business model innovation for sustainability aiming to develop a common language and foster SBM development, were first reviewed by Bocken et al. (2014), and further updated by Ritala et al. (2018) and by Bocken et al. (2019). The archetypes are: 1) maximising material and energy efficiency; 2) closing resource loops; 3) substituting with renewables and natural processes; 4) delivering functionality rather than ownership; 5) adopting a stewardship role; 6) encouraging sufficiency; 7) re-purposing the business for the society/environment; 8) creating inclusive value; and 9) developing sustainable scale-up solutions. The archetypes are further classified as environmentally, socially, and economically oriented innovations which describe the main type of SBM innovation. These archetypes are summarised in Table 6.

Table 6. SBM archetypes (Bocken et al., 2014; 2019; Ritala et al., 2018)

SBM archetype	Aim	General examples	Company examples
Maximise material and energy efficiency	Reduced emissions, optimised use of resources and minimised environmental footprint	Lean manufacturing Dematerialisation Increased functionality Low carbon solutions	Toyota's lean production system Tesla's electric cars
Closing resource loops	Reduced waste, virgin material use, and environmental footprint	Cradle-to-cradle Industrial symbiosis End-of-life strategies	Interface's Net-Works programme Adidas recycled ocean plastic shoes
Substitute with renewables and natural processes	Reduced use of non-renewable resources and emissions associated with fossil fuels	Cleantech Renewable energy Biomimicry	SolarCity's solar energy solutions St1's biofuels
Deliver functionality, not ownership	Maximised use of products, enhanced efficiency in use and reuse of materials	PSSs Rental/lease Pay-per-use	HOMIE's pay-per-use washing machine
Adopt a stewardship role	Stakeholders' long-term health and wellbeing	Community development Biodiversity protection Ethical trade, fair trade	Tom's one-to-one business model
Encourage sufficiency	Reduced over-consumption and educated consumers	Consumer education Demand management Slow fashion	Patagonia's responsible marketing
Re-purpose the business for society/the environment	Prioritised delivery of social and environmental benefits (rather than economic profit maximisation)	Social enterprises B-corporations Non-profits Net positive initiatives	Grameen Bank's microcredits and Grameen Shakti's solar systems in rural areas
Inclusive value creation	Optimised use of resources and wealth creation	Collaborative platforms Peer-to-peer and sharing models	BlaBlaCar's shared drives
Develop sustainable scale-up solutions	Maximised sustainability benefits by delivering sustainable solutions at scale	Licensing, franchising Co-creation Crowdfunding	Body Shop's franchising

The first three archetypes are environmentally oriented and focus mainly on product innovation, manufacturing processes, and the supply chain. *Maximise material and energy efficiency* aims to create sustainable value through eliminating emissions, cleaner production, efficient supply chains, and optimising the resources used. This requires innovation in the offering and manufacturing process, new partnerships, and value network reconfigurations. From the company's perspective, costs are reduced through the better risk management and optimised use of materials, and increased revenue is associated with cleaner products. *Closing resource loops* is concerned with eliminating the concept of waste and reducing virgin material use by turning existing waste streams

into useful and valuable input for other production processes. This requires innovation in the value chain and new partnerships across industries. *Substitute with renewables and natural processes* aims to reduce the use of non-renewable resources, emissions associated with burning fossil fuels, and synthetic waste to landfill, for example, by increasing the use of renewable energy sources, such as solar and wind. Revenue is associated with new products and services, and costs are reduced through better risk management (e.g. relating to climate change, an increased oil price, and legislative pressure).

The next three archetypes are described as socially oriented innovations that focus on changing consumer behaviour, innovations in the consumer offering, and overall broader responsibility. *Deliver functionality, not ownership*, based on the PSS literature, is concerned with maximising the use of products and satisfying user needs without users having to own physical products. This requires innovation in the product-service offering, new direct partnerships with consumers, and more integrated supply chains to create service experiences. Examples vary from traditional car rental to newer start-ups, such as HOMIE (Bocken et al., 2018), which offers pay-per-use home appliances. *Adopt a stewardship role* is about taking additional responsibility for creating broader benefits for stakeholders. For example, companies engage in improving working conditions or the physical areas in which they operate. Stewardship strategies can generate brand value and premium pricing, and stakeholder wellbeing generates long-term business benefits. *Encourage sufficiency* considers reducing demand-side consumption by educating consumers, ensuring product durability and longevity, and responsible product distribution and promotion.

The last three archetypes are economically oriented innovations which seek wider organisational and cultural concerns, prioritising the delivery of social and environmental benefits (rather than economic profit maximisation) and changing the company structure for sustainability. Examples include non-profit and social businesses, benefit corporations, and net positive initiatives. *Inclusive value creation* is about sharing resources, skills, and knowledge, creating new business opportunities, and distributing wealth. Examples of this archetype are collaborative consumption peer-to-peer and sharing models. *Develop sustainable scale-up solutions* aims to maximise the benefits for society and the environment by delivering large-scale sustainable solutions. Examples include models such as licensing, franchising, co-creation, open innovation, and crowdfunding platforms focusing on sustainable initiatives. Companies can use one SBM archetype or a selection to shape their own transformation, but real sustainability almost certainly demands the combined use of different archetypes (Bocken et al., 2014).

Different business model innovations for sustainability vary with the scope and degree of change, and the level of innovation (Adams et al., 2016; Machiba, 2010; Quist and Tukker, 2013). The classification of SBM innovations as presented in Figure 7 can be roughly categorised into incremental innovation and radical (or systemic) innovation. SBM innovations should not be limited to innovations in products and processes, but include innovations in the value chain, the entire industry sector, and system-level

institutional and social structures. In addition, SBM innovations vary with the technology/people dimension (Adams et al., 2016). Eco-innovation in products and processes has tended to rely on technological development reflecting incremental innovation (Machiba, 2010), but the focus has recently shifted to more systemic, non-technological, and people-centred innovations in which sustainability is treated as a socio-technical challenge (Adams et al., 2016). In sum, the greater the degree and scope of change, the greater the potential of sustainability benefits but at the same time, the greater the complexity (Machiba, 2010). Despite many barriers, it must be clear that incremental improvements are insufficient. A systemic view of SBM innovation is essential to foster more radical changes towards sustainability (Adams et al., 2016; Machiba, 2010; Quist and Tukker, 2013).

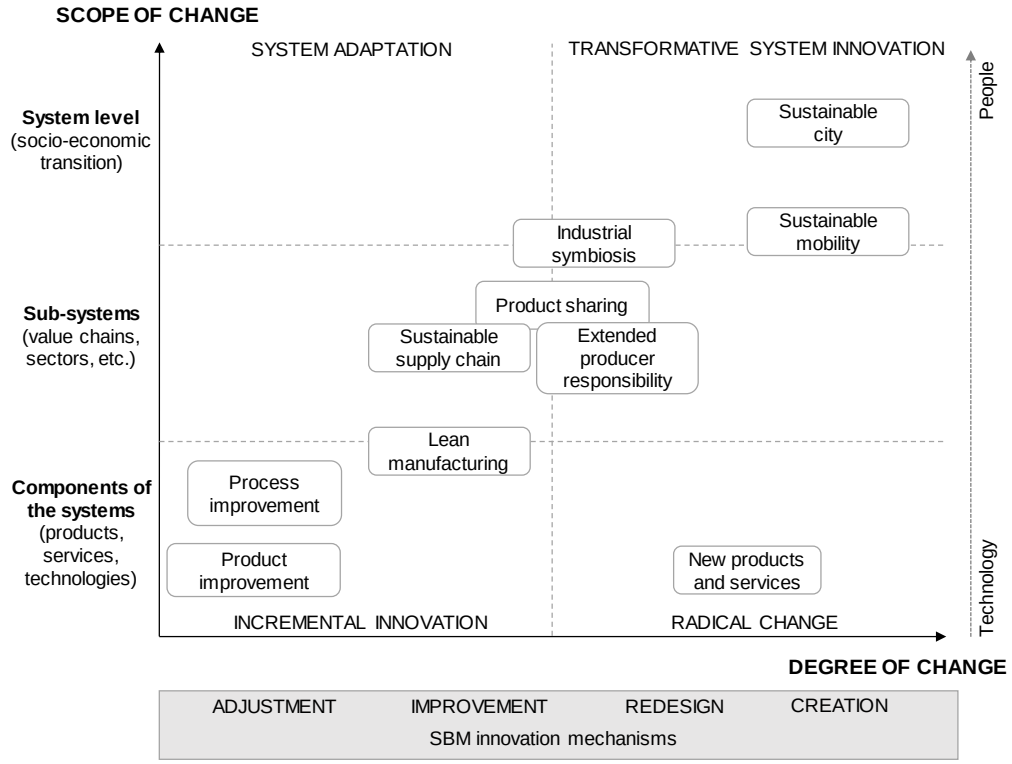

Figure 7. Classification of SBM innovation types (Adams et al., 2016; Machiba, 2010; Quist and Tukker, 2013)

2.3 Systemic change theories in sustainability management

With the relevance of the systemic perspective, the other main sub-section considering the theoretical background of this thesis is systemic change theories. Since this field of research is broad, the focus is narrowed to systemic change in sustainability management and the context of SBMs. Recently, the first studies focusing on the interplay between

business models and systemic change towards sustainability (or sustainability transitions) have emerged in both the management and transition literature. So far, the business model literature has focused on the company's internal operations and payed little attention to the system-level effects of business model change (Abdelkafi and Täuscher, 2016; Gorissen et al., 2016), whereas the transition literature has emphasised system-level changes and underplayed the role of individual companies (Köhler et al., 2019; Markard et al., 2012). Pioneering studies focusing on both systemic change towards sustainability, or sustainability transitions and business models are summarised in Table 7. These key publications have been published since 2013, and the key journals are: *Energy Policy*, *Environmental Innovation and Societal Transitions*, the *Journal of Cleaner Production*, *Organization and Environment*, and *Research Policy*. Both empirical case studies and conceptual papers are found. However, these are just early attempts to refer explicitly to both business model and transition theory, and there are many opportunities for further empirical investigation and conceptual groundwork at the intersection of business model and transition research (Bidmon and Knab, 2018; Köhler et al., 2019).

Table 7. Pioneer studies focusing on systemic change towards sustainability/sustainability transitions and business models

Author(s)/ Publication name	**Type of study**	**Theme/ focus area(s)**	**Systemic change theories applied**	**Further research**
Hannon et al., 2013/ *Energy Policy*	Empirical, case study	Energy Service Company business models' role in sustainability transitions	Transition theory: co-evolutionary approach	Key barriers in sustainability transition
Loorbach and Wijsman, 2013/ *Journal of Cleaner Production*	Empirical, case study	The co-evolution between societal and company-level sustainability transitions	Transition theories: MLP and MPM	Deeper analyses of the relationship between societal sustainability transitions and the role of business, e.g. how societal value could be translated into economic value for the company
Abdelkafi and Täuscher, 2016/ *Organization and Environment*	Conceptual	Sustainable value creation and value capture logic of the company	System dynamics: causal-loop diagrams and stock and flow models	The mechanisms by which the value proposition, value created and captured can reinforce each other; how different actors enhance SBM implementation
Bolton and Hannon, 2016/ *Research Policy*	Empirical, case study	Innovative/emergent business models' role in sustainability transitions	Transition theories: MLP and LTS; systems approach: activity systems	The role of incumbent companies and their business models in sustainability transitions

Gorissen et al., 2016/ *Sustainability*	Empirical, case study	Business models' role in sustainability transitions	Transition theory: MLP; systems thinking	Connection between business model and societal system, e.g. how to support transformative experiments, how to overcome institutional inertia/risk avoidance
Iñigo and Albareda, 2016/ *Journal of Cleaner Production*	Conceptual	The complexity of sustainable innovation implementation within companies	System thinking; transition theory: TM (complex adaptive system)	The role of companies in sustainable innovation and sustainable transitions; empirical and interdisciplinary research
Schaltegger et al., 2016b/ *Organization and Environment*	Conceptual	The co-evolutionary SBM development for niche pioneers and incumbents aiming at sustainability transitions	Transition theory: co-evolutionary approach	More empirical and conceptual research on the issue; co-evolution of all relevant actors in the market
Wainstein and Bumpus, 2016/ *Journal of Cleaner Production*	Empirical, case study	SBM innovation as key driver in accelerating sustainability transitions	Transition theory: MLP	The role of grass roots and peer-to-peer business models in smart energy transition
Sarasini and Linder, 2018/ *Environmental Innovation and Societal Transitions*	Conceptual	A business model perspective combined with core concepts and constructs from transition theory	Transition theories (TIS, MLP, SNM, TM)	The role and types of policy interventions that can stimulate SBMs
Bidmon and Knab, 2018/ *Journal of Cleaner Production*	Conceptual	Business models' role in sustainability transitions and their impact on transition dynamics	Transition theory: MLP	The integration of research on business models and sustainability transitions

Following Clarke and Crane (2018), studies of systemic change and SBMs focus on: SBM choices that lead to systemic change; systemic change and the role of SBMs; the impacts of SBMs and the systemic changes that lead to them; the overarching issue and how it relates to any of these steps; and the institutional environment and how it relates to any of these steps. Within these pioneer studies, the focus is mainly on the role of SBMs in sustainability transitions (Bidmon and Knab, 2018; Hannon et al., 2013; Gorissen et al., 2016; Schaltegger et al., 2016b; Wainstein and Bumpus, 2016). These studies discuss: the interface of business models and socio-technical systems (Bolton and Hannon, 2016); the co-evolution between business model and system-level change towards sustainability (Loorbach and Wijsman, 2013); and business models' impact on transition dynamics (Bidmon and Knab, 2018), and combine a business model perspective with core concepts and constructs from transition theory (Sarasini and Linder, 2018). Abdelkafi and

Täuscher (2016) further focus on sustainability impacts, and Iñigo and Albareda (2016) build an understanding of the overarching issue.

Systems thinking approaches and different transition theories are applied to explain both the business model change at the company level and the wider socio-technical transition to sustainability. These transition theories are the multi-level perspective (MLP), technological innovation systems (TIS), transition management (TM), strategic niche management (SNM), large technical systems (LTS), the multi-phase model, and the co-evolutionary approach. Transition theories and systems thinking, which are applied in individual publications in this thesis, are discussed more closely in the following sub-sections.

Additionally, there is a broad range of other relevant theoretical approaches which have been used to study and explain systemic change and transitions (Markard et al., 2012). For example, in this thesis, institutional theory is applied in Publication IV to examine the barriers to SBM innovations. Institutional theory has been used to explain companies' responses to sustainability issues (Brammer et al., 2012; Campbell, 2007; Ranta et al., 2018b) and business model choices (Escobar and Vredenburg; 2011; Provance et al., 2011), as well as sustainability transitions (Fuenfschilling and Truffer, 2014). This thesis contributes to this young field of research, which integrates research on business models and sustainability transitions. Publication IV, which considers barriers to sustainability transitions and the enabling of conditions to overcome these barriers, represents one of the first research articles considering the topic. Publication V adopts the transition theory and the concept of strong sustainability for an understanding of socio-technical transitions and business model changes towards sustainability. Publications I-III exploit views from systems thinking to understand the wider system-level sustainability impacts of SBMs and the business choices affecting them.

2.3.1 **Transition theories**

Four theoretical frameworks have achieved some prominence in the field of sustainability transition studies: transition management (TM); strategic niche management (SNM); the multi-level perspective (MLP); and technological innovation systems (TIS) (Köhler et al., 2019; Markard et al., 2012; Sarasini and Linder, 2018). Both SNM (Kemp et al., 1998; Schot and Geels, 2008) and TM (Kemp et al., 2007; Rotmans et al., 2001) are policy-centric frameworks, but they differ in scale. While SNM focuses on the change of individual technologies within socio-technological systems, TM focuses on the change of entire structures in societal systems. MLP and TIS have been dominant approaches in researching innovation dynamics in sustainability transition processes (Coenen et al., 2012; Markard and Truffer, 2008). Both approaches conceptualise socio-technical systems as interrelated sets of actors, networks, institutions, and technologies or artefacts, and they aim to increase the understanding of radical innovation processes and socio-technical transitions. These are also the two transition theories applied in this thesis. TIS is adopted in Publication IV, and MLP in Publication V.

Technological innovation systems combines ideas from innovation systems theory and industrial economics, and it is concerned with how the research, government, and business sectors facilitate the development of new technological innovations (Köhler et al., 2019; Markard et al., 2012; Smith et al., 2010). TIS focuses on understanding the dynamics of an innovation system centred around a specific technology (Markard et al., 2015). TIS comprises different structural components (actors, networks, institutions) and functions with various activities, which are presented in Figure 8 (Bergek et al., 2008; Hekkert et al., 2007). The actors involved in the TIS include the innovating companies, and their various direct and indirect stakeholders (Farla et al., 2012). Policymakers can play a large role in creating a favourable regulative environment for an innovation, consumer demands play a vital role in guiding the characteristics of an innovations, employee values can play a role in the development of sustainable innovations, and various civil movements also affect innovators' decision making. The success of sustainable innovations depends to a large extent on their environment, as well as the structure and dynamics of the innovation system (Markard et al., 2015). TIS has received considerable attention with regard to sustainability issues, such as renewable energy (Shum and Watanabe, 2009), sustainable transport technologies (Farla et al., 2010), and sustainable water management (Ward et al., 2012). However, the focus in these studies has been mostly on the physical technologies involved in the innovation system, although the TIS framework has the potential to address many other issues (Markard et al., 2015). Publication IV goes beyond technology development and applies TIS to understand the successful process of SBM innovation diffusion.

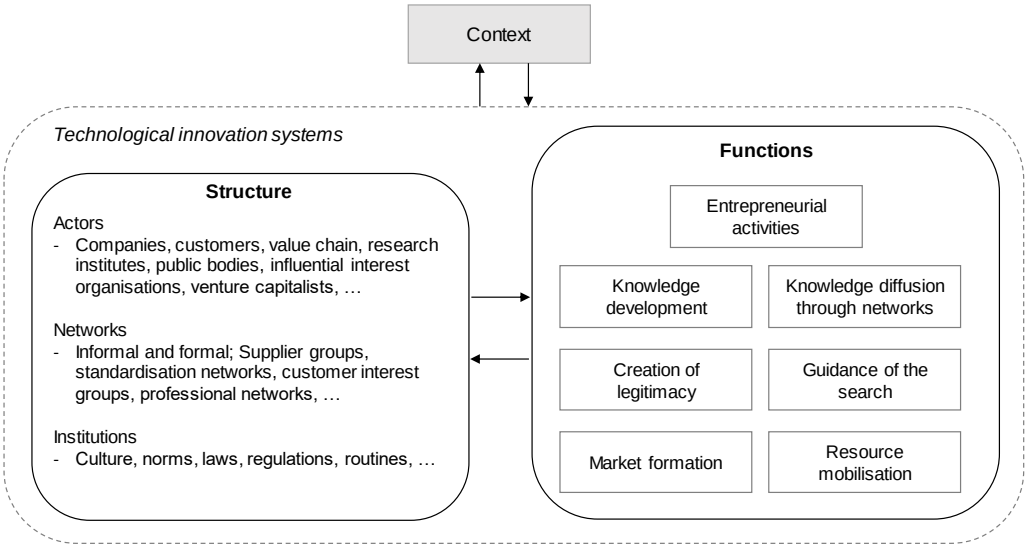

Figure 8. Basic components of TIS (Bergek et al., 2008; Hekkert et al., 2007)

The *multi-level perspective* on socio-technical transitions (Geels, 2002; Geels and Schot, 2007; Smith et al., 2010) is a prominent approach in transition studies (Köhler et al., 2019). It combines ideas from evolutionary economics and the sociology of innovation

and institutional theory (ibid.), and organises analysis into a system that consists of niches, regimes, and landscapes (Geels, 2002). MLP argues that transitions come about through dynamic interactions within and between these three levels (Geels and Schot, 2007). A niche is a protected space, i.e., specific markets, in which radical innovations can develop without the pressure of the dominant regime (Kemp et al., 1998). Niche innovations may gain momentum and compete with established technologies, processes, and business models if landscape developments put pressure on the regime, and the regime creates windows of opportunity (Geels and Schot, 2007; Markard et al., 2012; Smith et al., 2010). Niches are relatively unstable compared to regimes with tighter norms and rules (Smith et al., 2010). The ability to achieve a more sustainable system ultimately depends on agency, which drives niche innovations, implements regime changes, connects niches and regimes, or mobilises widespread social legitimacy (Bork et al., 2015; Grin et al., 2011). The socio-technical regime, which is one of the key concepts of transitions research (Markard et al., 2012), represents the institutional structuring of an existing system, leading to path dependence and incremental change (Geels, 2002; Köhler et al., 2019; Smith et al., 2010). Both niches, where "revolutionary" change originates, and regimes, which tend to produce "normal" innovations, are situated within a broader socio-technical landscape that provides a macro-level structuring context (Smith et al., 2010). The landscape refers to the wider external environment, including macro-economics and broad economic restructuring, environmental and demographic change, deep cultural patterns and new social movements, shifts in general political ideology, and emerging scientific paradigms (Geels, 2002; Geels and Schot, 2007; Smith et al., 2010). The landscape is constantly transforming, but relatively slowly compared to regimes (Geels and Schot, 2007). Publication V adopts the MLP to understand both socio-technical transitions and company-level business model changes towards sustainability.

2.3.2 **Systems thinking**

Publications I and III apply *systems thinking* – a method for analysing the relationships between a system's parts, reveal direct and indirect effects, and understand the non-linear behaviour of complex systems over time. A system must consist of three features: elements; interconnections; and a function, purpose, or goal (Meadows, 2008). Many of the system elements are visible, tangible things, such as buildings, books, professors, students, and computers, which form a system – a university, but they can also be intangibles, such as school pride and academic prowess. The interconnections are the relationships that hold the elements together. Some of them are actual physical flows, such as the students progressing through a university, but many of them are intangible, such as information flows. If intangible flows are difficult to identify, functions or purposes are even more difficult. A system's function or purpose is not necessarily clear for every party in systems, or it may not be spoken of, written about, or expressed explicitly at all (Meadows, 2008). However, without a common goal, the system functions inefficiently, and there is an even bigger chance of conflict.

It is suggested that systems thinking can investigate and understand the complexity of economic, ecological, and social systems (Holling, 2001), the interconnections between

system-level and corporate-level sustainability (Whiteman et al., 2013), and the logics of business models (Abdelkafi and Täuscher, 2016). The literature on systems thinking and sustainability management is an emerging research field which has grown rapidly since 2011 (Williams et al., 2017). Until then, the body of corporate sustainability literature did not use a systems perspective as its starting point but focused more linearly on the effects on the company (Whiteman et al., 2013). However, sustainability management studies are still isolated from socio-ecological systems (Williams et al., 2017), although the understanding of the interdependence between organisations and the natural environment is central to advancing system-level sustainability and respecting planetary boundaries (Rockström et al., 2009; Whiteman et al., 2013). From the systems thinking perspective, companies depend on the natural environment for inputs, and companies' actions directly impact the natural environment through feedback loops (Hjorth and Bagheri, 2006). The value of a systems thinking approach to sustainability issues in management is based on the recognition of the complexity of interconnected social and ecological problems, and the consideration of the dynamic interconnections between actors across social, economic, and ecological systems (Williams et al., 2017).

Systems thinking requires: shifting from a linear mindset to a circular one and the ability to identify connections between parts of a system; an understanding of stocks (pools of resources in a system); flows (e.g. material or information that enters or leaves a stock over a period) and variables (changeable parts of the system that affect stocks and flows); going beyond linear cause and effect approaches, and identifying and understanding non-linear relationships and feedback loops; an understanding of the elements and characteristics of a system, i.e. system structure; an understanding of the dynamic behaviour within a system and a broadening perspective both in space and time (Arnold and Wade, 2015; Meadows, 2008). From the management perspective, systems thinking is a multifaceted and complex approach, in which managers are problem solvers. Systems thinking requires managers to view opportunities, problems, and their solution within the context of the overall system. This requires an ability to conceptually model different parts of a system and view it in different ways (Arnold and Wade, 2015). Different visualisation techniques are used to model systems, for example, network analysis (Allee, 2008), stock-and-flow diagrams with feedback loops (Meadows, 2008), and system dynamics and causal loop diagrams (Abdelkafi and Täuscher, 2016; Hjorth and Bagheri, 2006).

However, decision making for sustainability is not easy: it is about balancing economic, social, and environmental goals, as well as the different stakeholders' needs and preferences. Paradoxical thinking is posited to help companies make sense of the complexity of sustainability, reduce tensions, ambiguity, and uncertainty, and improve the management of complex sustainability challenges (Hahn et al., 2015; Smith and Lewis, 2011; Van der Byl and Slawinski, 2015). Paradoxical thinking attempts to transform value uncaptured or value destruction into new business opportunities and sustainable value creation (Bocken et al., 2013; Yang et al., 2017b).

2.4 Theoretical framework for the study

By seeing SBM research as an integrative field and combining views from the corporate sustainability, traditional business model, and system transition literatures, this thesis focuses on interconnections between company and system levels in five individual publications. Corporate sustainability, i.e. sustainable business, concerns the translation of the general principles of sustainable development into business practice through sustainability strategies and SBMs. The business model provides a link between the company and system level by creating value. Conversely, the business model is affected by the environment in which the company operates. The sustainability transition focuses on the interplay between company- and system-level transition towards system-level sustainability. The theoretical framework for SBMs in advancing system-level sustainability is presented in Figure 9. The figure presents how the key concepts of the thesis, the SBM, sustainable business, sustainability transition, system-level sustainability, and sustainable value creation, relate to each other, and positions the individual publications within the framework.

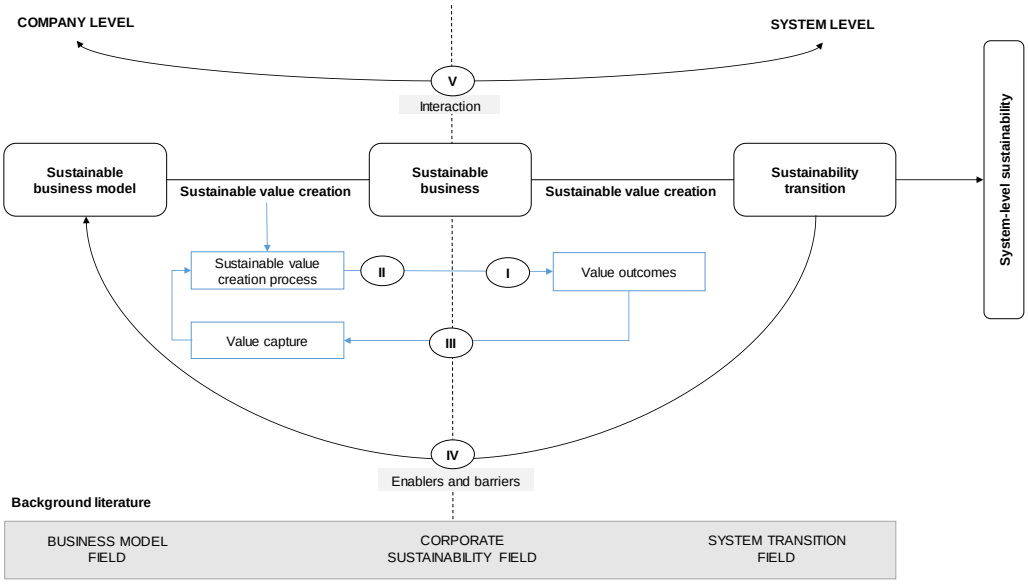

Figure 9. Theoretical framework of this thesis

Each publication plays a specific role in answering the main research question: *How is system-level sustainability advanced through sustainable business models?* Table 8 summarises how the different theoretical fields are applied in the individual publications to address the outlined research gaps.

Table 8. Theories applied in the publications and addressed research gaps

Publ.	Theories/approaches applied	Addressed research gaps	Key sources
I	SBMs Sustainable value creation Corporate sustainability TBL Systems thinking	Sustainability impacts of SBMs • Limited perspective on sustainable value creation: integrated TBL perspective, lack of sustainability goals, value destruction perspective • Assessment of the value creation potential and impact of SBMs	Bocken et al., 2013; 2015 Hahn et al., 2010; 2015 Morioka et al., 2018b Yang et al., 2017a; 2017b
II	Sharing business models (as examples of SBMs) Sustainable value creation Value capture TBL	Sustainability impacts of sharing business models/SBMs • Limited perspective on sustainable value creation: integrated TBL perspective, sustainability impacts for multiple stakeholders, value destruction perspective	Acquier et al., 2017 Den Ouden, 2012 Frenkend and Schor, 2017 Yang et al., 2017a; 2017b
III	SBMs Sustainable value creation Value capture Multicapital approach Systems thinking	Sustainability impacts of SBMs and impacts on companies' economic performance • Limited perspective on sustainable value creation and value capture potential: integrated TBL perspective, direct/indirect and certain/uncertain effects • Assessment of the value creation and capture potential	Abdelkafi and Täuscher, 2016 Casadesus-Masanell and Ricart, 2011 McElroy and Thomas, 2016 Schaltegger et al., 2012
IV	SBMs Institutional theory Transition theory: TIS	Enabling conditions for business model changes towards sustainability • Social and political changes required to make SBMs mainstream • Structural and cultural driving forces and barriers with an impact on SBM innovation	Bergek et al., 2008 Bocken et al., 2014 Farla et al., 2012 Hekkert et al., 2007
V	SBMs Sustainable value creation Transition theories: MLP and triple embeddedness framework (TEF)	Sustainability impacts of SBMs and the role of business environment in enhancing the transition to more SBMs • Business model concept as a bridge between company-level corporate sustainability and system-level sustainability innovation	Dyllick and Muff, 2016 Gauthier and Gilomen, 2016 Geels, 2011; 2014

3 Research design

This chapter describes the philosophical background and methodological choices that have guided this research. The overall research process consists of multiple consecutive choices (Creswell, 2013; Crotty, 1998; Eriksson and Kovalainen, 2008). The stages vary slightly, but they usually include formulating and clarifying the topic, reviewing the literature, designing the research, collecting data, analysing data, and writing (Saunders, 2016). The first section in this chapter introduces the research approach and methodological choices. The second presents the data collection and analysis methods, and the chapter concludes with an evaluation of the quality of the research.

3.1 Research approach and methodological choices

In choosing a research approach appropriate for the topic in question, it is important to first identify the particular beliefs and philosophical assumptions on which the research relies. These assumptions often remain hidden in research, but they inform the choice of theories and guide the research's methodological choices. (Creswell, 2013) In business research, two philosophical assumptions, ontology and epistemology, need to be clarified (Bryman and Bell, 2007; Eriksson and Kovalainen, 2016; Saunders et al., 2016).

Ontology relates to the existence of knowledge about the world and the social entities within it (Bryman and Bell, 2007; Eriksson and Kovalainen, 2016). In general, ontological assumptions range between realist approaches, where reality is seen as objective and "real", and subjectivist approaches, where reality is understood as being constructed in the minds of individuals. The latter is often referred to as social constructionism (Creswell, 2013). This thesis relies more on realism, i.e. objectivism as it refers to the scientific knowledge about sustainability, e.g., considering planetary boundaries and the carrying capacities of the planet and addressing system-level sustainability. *Epistemology* focuses on the questions of what knowledge is, how we view knowledge, and how we understand truth (Bryman and Bell, 2007; Eriksson and Kovalainen, 2016). Epistemological positions range from objectivist positions, where truth can be found through adequate evidence and facts, to subjectivist positions, which subscribe to the view that absolute truth cannot be determined, but is only the result of human-made constructions. This thesis relies on the subjectivist view, as it sees business models as constructed based on different values and objectives, and value is always subjective because it is perceived by multiple stakeholders. Together, these ontological and epistemological positions reflect critical realism (Al-Amoudi and Willmott, 2011; Carolan, 2005; Fleetwood, 2005). Critical realism, which is a relatively new approach to ontological and epistemological issues, is applied in many disciplines, including management (Easton, 2010). It is also seen suitable for multidisciplinary research, e.g. bringing the social and the natural sciences together (Carolan, 2005).

In general, three types of research approach exist: quantitative; qualitative; and mixed method (Creswell, 2003). In this thesis, all the studies followed the qualitative research

approach. Quantitative research generates data that allows numerical analysis, uses statistical calculations, and seeks explanations and correlations, whereas qualitative research describes phenomena in context, interprets processes or meanings, and seeks "understanding" (Silverman, 2014). However, there is no simple distinction between quantitative and qualitative research, but both forms of research have their strengths and limitations (Silverman, 2010). A qualitative research approach was adopted in this thesis, as it is appropriate when a problem or issue needs to be explored, a complex and detailed understanding of the issue is required, and partial or inadequate theories exist and new theories need to be developed (Creswell, 2013). The nature of the research was exploratory, as previous studies combining company- and system-level change towards sustainability are rare. For exploratory research, qualitative methods are most useful, as they can result in explanations and hypothesis building. (Ghauri and Grønhaug, 2010)

A combination of different research strategies and methods, suitable for qualitative research approach, was used in this thesis. The research strategies used in this thesis are: design science research (Publication I); case study (Publications II and III); Delphi study (Publication IV); and conceptual study (Publication V). These research strategies are discussed in detail in the following sub-sections. Further, data collection and analysis methods are discussed in Section 3.2. Table 9 summarises the methodological choices of each publication.

Table 9. Methodological choices

Publication	Research objective	Research strategy	Research methods
I	To reveal potential indirect effects, stakeholder conflicts leading to value destruction, instead of sustainable value created	Design science research: Design Research Methodology	Secondary data collection Observation Unstructured interview Written feedback Content analysis
II	To explain the relationship between business model choice and sustainable value created/ captured	Case study: multiple case study	Secondary data collection Content analysis
III	To explain the value capture potential of sustainable value creation	Case study: single case study	Secondary data collection Semi-structured interview Content analysis
IV	To identify the barriers to SBM innovation and explore how the innovation system can overcome them	Delphi study	Semi-structured interview Questionnaire Content analysis
V	To explain both the business model change at company level and wider socio-technical transition to sustainability	Conceptual study	Literature review Qualitative synthesis

3.1.1 Case study

In Publications II and III, a case study research strategy was followed to explain the relationship between the business model choice and sustainable value created and captured, as well as the value capture potential of sustainable value creation. Case studies appear consistently over the years (Creswell, 2013), and they are widely used in business research (Bryman and Bell, 2007; Eriksson and Kovalainen, 2016; Ghauri and Grønhaug, 2010). A case study is an appropriate strategy for building new theory and examining novel and complex phenomena (Yin, 2013). In business research, a case study is particularly useful when the phenomenon under investigation is difficult to study outside its natural setting, and when the variables and concepts under study are difficult to quantify (Ghauri and Grønhaug, 2010). According to Creswell (2013), case study research is a qualitative approach in which the researcher explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through in-depth data collection. A case study is excellent at generating holistic knowledge through the use of multiple data sources (Eriksson and Kovalainen, 2016). Case study data collection and data analysis methods may vary depending on study aims, which means that the case study is more a research approach or research strategy than a method (Eriksson and Kovalainen, 2016). Case studies vary from intensive case studies, e.g. a single in-depth case study, to extensive case studies, e.g. a multiple case study (Eriksson and Kovalainen, 2016; Yin, 2013). An intensive case study aims to understand the case in-depth by providing a holistic and contextualised description and interpretation, whereas an extensive case study aims to advance or generate theory by comparing a number of cases to achieve a generalisation (Eriksson and Kovalainen, 2016). To conduct the case studies, a specific procedure consisting of case identification, purposeful sampling, data collection, and data analysis was followed (Creswell, 2013).

Publication II followed the multiple case study approach. The *case* was an SBM, consisting of sustainable value propositions, sustainable value creation, and value capture. In case selection, purposeful sampling was followed. Sharing business models were selected to represent examples of SBMs, because the number of sharing business models has increased dramatically in recent years, and there is much interest in the potential of these models to create sustainable value (Acquier et al., 2017; Hamari et al., 2016). The aim was to select a representative sample of viable sharing business models covering four major sectors in peer-to-peer (P2P) and business-to-customer (B2C) business: accommodation; mobility; food; and consumer goods. The cases were selected on the basis of a review of the sharing economy and SBM literature, and other research on sharing business was used, for example, Honeycomb 3.0 (Owyang, 2016). More than twenty sharing business models were analysed using the five-step process, but twenty sharing business models were finally included in the study. These business models are listed in Table 10. Data collection and analysis are discussed in Section 3.2.1.

Table 10. Selected cases in four different sectors

Company	Founded	Short business model description
Accommodation		
Airbnb	2008 in USA	P2P accommodation renting in 190+ countries
GuesttoGuest	2009 in UK	P2P accommodation swapping in ~190 countries
HomeExchange.com	1992 in USA	P2P accommodation swapping in 150+ countries
HomeAway	2005 in USA	P2P accommodation renting in ~190 countries
Love Home Swap	2011 in France	P2P accommodation swapping in ~190 countries
Mobility		
BlaBlaCar	2006 in France	P2P ride sharing/pooling in 20+ countries
Blue Bikes	2011 in USA	B2C bike renting in Boston
Car2go	2008 in Germany	B2C car renting in 8 countries
Turo	2009 in USA	P2P car renting in USA and Canada
Uber	2009 in USA	P2P ride offering around the world
Zipcar	2000 in USA	B2C car renting in 8 countries
Food		
EatWith	2012 in Israel	P2P food (dinners) sharing in 30+ countries
FoodCloud	2012 in Ireland	B2charity2C surplus food donating in Ireland
Shareyourmeal	2012 in the Netherlands	P2P food (meals) reselling, mainly in the NL
The Food Assembly	2010 in France	B2C local food selling in Europe
Consumer goods		
BookMooch	2006 in USA	P2P book swapping in 90+ countries
Fashion Hire	2006 in UK	B2C designer handbag renting in UK
Freecycle	2003 in USA	P2P goods gifting in 85+ countries
Peerby	2012 in the Netherlands	P2P goods lending in Europe and USA
Rent the Runway	2009 in USA	B2C designer apparel renting in USA

Publication III followed the single in-depth case study approach. The *case* was a sustainability initiative built on strategic sustainability focus areas and goals. The selected case company is a Finnish horticultural company which offers high-quality substrates, peat products, fertilisers, garden products, and landscaping soils and mulches. The company was chosen because it had already taken considerable steps towards sustainability and was a forerunner in adopting an SBM. The company has an ambitious goal of moving from being a market-driven company to one that shapes the future (Dyllick and Muff, 2016) by being part of a larger food system and solving the global food challenge. The company also has an ambition to develop its business based on research, meaning that it builds business on four sustainability principles (Robèrt et al., 2012), and planetary boundaries (Rockström et al., 2009) are considered in decision making. It therefore provided an interesting research opportunity to empirically examine the sustainable value creation and value capture potential.

3.1.2 **Delphi study**

In Publication IV, Delphi, specifically the qualitative Argument Delphi (Kuusi, 1999), was used to explore the barriers to SBM innovation and identify how the innovation system actors enable SBM innovation. The Delphi is a qualitative research strategy that is applied widely to a variety of problems where input from multiple experts is needed. Delphi can be characterised as a strategy for structuring a group communication process to make the process effective in allowing a group of individuals to deal with a complex problem (Linstone and Turoff, 1975). The key characteristics of a traditional Delphi study are iterative questionnaires, anonymous responses, and controlled feedback (Landeta, 2006; Rowe and Wright, 1999). Traditionally, Delphi studies have aimed to reach consensus among experts, while Policy Delphi (Turoff, 1970) studies have also acknowledged disagreements about preferred futures. The Argument Delphi (Kuusi, 1999) used in this study can be seen as a variant of the Policy Delphi. Delphi typically entails two or more rounds, and the procedure relies on a panel of experts. Delphi is an appropriate method for bringing together a large number of qualified experts who have heterogeneous backgrounds to solve a complex problem. The selection of experts is the crucial phase of the process. The procedure (Okoli and Pawlowski, 2004) based on the nominal group technique by Delbecq et al. (1975) and the matrix of expertise (Kuusi, 1999) for selecting appropriate experts was followed in this study. The experts represented a broad range of different sectors: business managers; consultants; researchers; government/the authorities; non-profit organisations and students; and different subject areas: political; economic; social; technological; environmental; and legal.

3.1.3 **Design science research**

In Publication I, design science research was used to create an understanding of both the positive and negative aspects of sustainable value creation and create a framework that could help companies investigate the value impacts of SBMs and understand the consequences of their sustainability actions. Design science research is widely utilised in information system research but is relatively new in management studies (Gregor and Hevner, 2013; Hevner, 2007; Peffers et al., 2007; Van Aken, 2004). Design science research was adopted because it fits the study's method of introducing and testing an artefact, i.e. a model, tool, construct, or framework. In general, design science research consists of interconnected phases: the identification of the problem; the identification of the objective and definition of requirements; the design and development of the artefact; artefact demonstration; the evaluation of the artefact; and communication and contribution (Dresh et al., 2015; Johannesson and Perjons, 2014; Peffers et al., 2007). In this study, the Design Research Methodology guideline (Blessing and Chakrabarti, 2009), which encompasses the literature and practice-based iterative stages to develop a framework, was followed.

3.2 Data collection and analysis

Data collection and analysis in this thesis were performed by following the qualitative research approach (Eriksson and Kovalainen, 2016; Silverman, 2014). Multiple methods were applied in data collection: semi-structured interviews (Publications III and IV); unstructured interviews (I); participant observation (I); web questionnaires (IV); and secondary data collection, such as a literature review (V), company websites (II), news (II), and organisational documents (III). Individual studies began with extensive literature reviews, and in Publication V, which is the conceptual paper, the data was collected entirely through a literature review. Overall, data collection and analysis were an iterative and circular process, in which literature reviews and empirical data collection, as well as data collection and data analysis, were alternated (Eriksson and Kovalainen, 2016; Flick, 2014). Data was collected between 2013 and 2018. In the following, the selected qualitative data collection methods – secondary data collection, research interview, observation, and the questionnaire – are discussed in general. A summary of the advantages and disadvantages of these methods is presented in Table 11. The data collection and analysis within the individual studies are explained in more detail in the following sub-sections.

Table 11. Advantages and disadvantages of qualitative data collection methods used in this research (Bryman and Bell, 2007; Eriksson and Kovalainen, 2016; Flick, 2014; Ghauri and Grønhaug, 2010; Saunders et al., 2016)

Data collection method	Advantages/ strengths	Disadvantages/ challenges
Secondary data collection	• Saving in resources • Access to extensive high-quality data • Opportunity to provide longitudinal studies and comparative research • Opportunity to generalise and triangulate by comparing secondary and primary data • May result in unforeseen discoveries • Availability/permanence of data	• Data may be collected for a purpose that does not match need • Aggregations that meet the requirements of the original research may be unsuitable • Control of data quality
Semi-structured and in-depth/ unstructured interviews	• First-hand information • Opportunity to collect a rich and detailed dataset • Flexibility	• Consumes resources • A lack of standardisation may lead to concerns about reliability/ dependability • Interviewer bias • Interviewee or response bias • Participation bias
Participant observation	• First-hand information in a natural setting	• Balancing participation and observation

	• Opportunity to get closer to the subject under research • Opportunity to interpret and understand the observed behaviour, attitude, and situation more accurately • Opportunity to capture the dynamics of social behaviour	• Observer's influence on observation • Observation does not provide insights into underlying motivations etc. • Observations (events, happenings) are difficult to translate into scientifically useful information • Ethical issues
Self-completion web questionnaire	• Effective tool to obtain opinions from a large group of people • Saving in resources • Convenience for respondents • Absence of interviewer effects	• Phrasing of questions • There is no one present to help respondents if they are having difficulty in answering a question • Cannot ask many questions • Cannot collect additional data • Response rate

Today, much *secondary data* is available. This data can be further analysed to provide different or additional knowledge, interpretations, and conclusions. Secondary data includes both quantitative and qualitative data, and both raw data and compiled data that have received a form of selection or summarising (Saunders et al., 2016). In business and management research, secondary data is used most frequently as part of a case study or survey research strategy, but it also fits with other strategies (ibid.). There is a variety of secondary data types (Bryman and Bell, 2007; Ghauri and Grønhaug, 2010; Saunders et al., 2016), such as the websites of different companies and organisations, government studies and reports, academic and professional journals, textbooks, news, personal documents, statistics, etc. When secondary data is unavailable or unable to answer research questions, primary data relevant to the research must be collected (Ghauri and Grønhaug, 2010).

In qualitative research, the most common primary data collection methods are interviews and observation (Bryman and Bell, 2007; Ghauri and Grønhaug, 2010). According to Saunders et al. (2016), the *research interview* is a purposeful conversation between two or more people, requiring the interviewer to ask purposeful questions and carefully listen to the answers to explore them further. A pleasant atmosphere and real interaction between the researcher and the respondent indicate a good interview (Ghauri and Grønhaug, 2010; Saunders et al., 2016). In general, there are two types of interview: structured interviews; and unstructured or in-depth interviews (Eriksson and Kovalainen, 2016; Ghauri and Grønhaug, 2010; Saunders et al., 2016). Structured interviews follow a systematic sampling and a standard format with an emphasis on fixed response categories that can be further analysed with quantitative methods. Unstructured interviews do not follow a particular procedure, but the interviewer may give some lead questions to gain an understanding of "how" and why" (Ghauri and Grønhaug, 2010). Between these types are *semi-structured interviews* (used in Publications III and IV), in which the researcher

has a list of themes and possibly some questions to be covered, whose use may vary between interviews. *Unstructured or in-depth interviews* (used in Publication I) are informal and more like conversations. In unstructured interviews, there is no predetermined list of questions to ask, although the researcher needs to have a clear idea of the aspect or aspects the researcher wants to explore. Undertaking an exploratory study or a study that includes an exploratory element, and in-depth and semi-structured interviews are appropriate data collection methods and can be used in a variety of research strategies. An interview may be highly unstructured but contain some structured parts, depending on its purpose (Saunders et al., 2016).

As a data collection method, *observation* is a tool for observing and listening to people's behaviour in a way that allows learning and analytical interpretation (Ghauri and Grønhaug, 2010). Observation is a qualitative research method of collecting empirical data in which the researcher may or may not have direct contact with the observed people and events (Eriksson and Kovalainen, 2016). At a high level, the observation method can be divided into participant and non-participant observation, and human and technology-mediated (e.g. use of video camera) methods (Flick, 2014; Ghauri and Grønhaug, 2010; Saunders et al., 2016). *Participant observation*, which is the data collection method used in Publication I, is the most typical observation method in business and management research (Eriksson and Kovalainen, 2016). In participant observation, where the observer is actively involved in the observed field, data collection is mainly based on the fieldnotes the researchers write during observations (Flick, 2014).

In business and management research, *questionnaires* are mostly used within the survey strategy (Ghauri and Grønhaug, 2010), but both case study and experiment research strategies may also use questionnaires (Saunders et al., 2016). Questionnaires provide an efficient way of collecting responses from a large sample, because each respondent is asked to respond to the same set of questions (Saunders et al., 2016). This is important in quantitative analysis, but also in qualitative analysis, when the objective is to gain an understanding of the topic from multiple perspectives, as is the case in this thesis in the Delphi study. A *self-completion web questionnaire* (Bryson and Bell, 2007) containing various kinds of question (Saunders et al., 2016) was used in this thesis. Most questions were open, because this suits the qualitative research approach.

3.2.1 Data collection and analysis of the case studies

A multiple case study approach was chosen in Publication II, in which the aim was to provide a theoretically grounded explanation for how business model choices affect created and captured sustainable value. Business model choices affecting the sustainable value created and captured were analysed by applying a five-step approach consisting of: 1) extracting distinct dimensions of sustainable value and forming a sustainable value framework; 2) extracting distinct dimensions of sharing business models and forming a sharing business model framework; 3) identifying specified value propositions and further synthesising general sharing business model value attributes; 4) analysing the sustainable value created and captured, as well as destroyed and uncaptured; and 5)

finally, identifying business model choices affecting the sustainable value created and captured, and synthesising business model attributes. Steps 1 and 2 were undertaken by a literature review, and Steps 3 to 5 by analysing the selected cases. The analysis was based on secondary data available on companies' websites, previous research, reports, and other public documents, as well as publicly available information. Each case involved similar types of data collection. First, basic data, such as general company details and general business model descriptions, was collected. A more thorough business model analysis was then conducted, using a sharing business model framework generated from the previous literature. A value analysis was further conducted by using a sustainable value framework also generated from the previous literature. The data was classified in tables to analyse and comprehend it, and the tables also helped to identify sustainable value and business model attributes within the synthesising phase. Data analysis was conducted by using the qualitative content analysis method (Eriksson and Kovalainen, 2016). Data collection and analysis were carried out through several iterations.

A single in-depth case study approach was chosen in Publication III, where the aim was to clarify the complex process – sustainable value creation and especially the value capture potential of an SBM. To address this aim, the study combined the previous literature and findings from a Finnish horticultural company. Both secondary and interview data played a major role. Data collection and analysis were also conducted through several iterations, and data was gathered from three sources. First, to gain an initial understanding of the topic, written material concerning the case company's sustainability strategy development process (including, e.g., sustainability focus areas, strategic goals, indicators, stakeholder maps, action plans, and sustainability initiatives with required inputs, and intended outputs and impacts) was reviewed and analysed. The analysis was based on the inductive reasoning and grounded theory method (Silverman, 2014). Second, to deepen understanding, a literature review covering the scientific literature and practice-related business studies was conducted. The findings from the literature were analysed using the thematic content analysis method (Myers, 2013), resulting in a summary of the sustainable value creation and value capture potential. Third, to obtain answers to open questions, the case company's communications and sustainability manager, and the brand, communications, and digitalisation director were interviewed. The semi-structured interview took two hours. Two researchers attended the interview, one of whom was mainly responsible for asking questions, and the other for writing notes. The interview covered the motivation to create sustainable value, sustainable value creation for multiple stakeholders, the value destruction perspective, and net positive impacts.

3.2.2 **Data collection and analysis of the Delphi study**

The Delphi study was adopted in Publication IV, the aim of which was to examine the barriers to SBM innovation and to understand the successful process of SBM innovation diffusion. The data was collected in several steps. Semi-structured expert interviews (Flick, 2014) started the study process. The objective was to shed more light on the role of the business in enhancing sustainable development, the enablers and barriers to SBM

innovations, and visions of an ideal SBM. Eight carefully selected experts representing business, academia, and politics were interviewed, and each interview lasted an average of roughly an hour and a half. Seven were face-to-face interviews; one was an Internet-mediated interview (on Skype) (Saunders et al., 2016). Interviews were tape-recorded and then carefully transcribed (Bryman and Bell, 2007).

The interview data formed the basis of the web questionnaire that followed (Saunders et al., 2016). The experts' comments in the questionnaire's first round further served as a basis for the second questionnaire round. The questionnaires in both rounds contained closed and open-ended questions. The experts evaluated the statements first on a 7-point Likert scale (e.g., ranging from totally probable to totally improbable, and from totally desirable to totally undesirable) and then gave written arguments. The open-ended questions allowed the experts to comment relatively freely on the SBM innovation. The experts were encouraged to interact with each other. A real-time Internet-based Delphi format allowed the possibility of a synchronic expert dialogue. After both rounds, the experts had an opportunity to comment on the other panellists' answers, and they also had an opportunity to clarify their own comments during the process. The responses were anonymous. Of forty-two experts, forty responded to the first round Delphi questionnaire, and twenty-seven participated in the second round. The overall Delphi procedure produced a rich dataset. Written comments on the statements and the previously transcribed interview data were analysed using qualitative methods. The qualitative data analysis was conducted based on content analysis (Bryman and Bell, 2007; Eriksson and Kovalainen, 2016; Silverman, 2014). The main focus in the analysis was on identifying the similarities and dissimilarities, and describing divergent themes and types.

3.2.3 Data collection and analysis of the design science research

The design science research approach was adopted in Publication I, where the aim was to investigate the value impacts of SBMs, understand sustainable value creation and especially value destruction more deeply, and to propose a framework that could help companies investigate the value impacts of SBMs, reveal potential stakeholder conflicts leading to value destruction, and understand the consequences of their sustainability actions. The framework was developed using multiple research steps: 1) research clarification; 2) initial framework development; 3) framework testing; and 4) revised framework development and data from multiple sources.

The proposed initial framework contained elements from the previous literature of SBMs and corporate sustainability complementary findings from empirical cases concerning twenty different sharing business models (the dataset used in Publication II). These sharing business models were well suited to this research context, as they are driven by economic, social, and environmental benefits (Heinrichs, 2013), but they are also criticised, because the sustainability goals are not achieved (Malhotra and Van Alstyne, 2014). An initial framework was further tested within the Case Course of Sustainable Business Models at LUT University. Thirty-four master's students with different backgrounds participated in framework testing. Some worked individually; others worked

in groups consisting of two to four members. Altogether, the framework was tested in fourteen different cases covering different industries: food production; food services; welfare services; air traffic (passenger and freight traffic); alcohol sales (wine); restaurants; heavy industry; mining; power production; and electric cars. A third of the participants were mature students working with business model cases concerning the companies at which they worked. The aim was to identify the strengths and weaknesses of the initial framework. Data from the testing was collected through participant observation (Saunders et al., 2016), open interviews (Silverman, 2014), and written feedback (Eriksson and Kovalainen, 2016). As the researcher works as teacher, the participant observation was done in a natural setting.

Written case descriptions and written field data from observations and interviews, and written feedback from participants were analysed through the thematic content analysis method (Myers, 2013), resulting in the strengths and weaknesses of the proposed framework, as well as categorisations of multiple stakeholders and sustainable value forms, and a list of the business model choices affecting sustainable value creation. The proposed framework was revised, considering the strengths and weaknesses, as well as the complementary literature. The data of multiple stakeholders, sustainable value form categorisations, and a list of business model choices affecting sustainable value creation create a basis for further research.

3.2.4 Data collection and analysis of the conceptual study

The conceptual study was adopted in Publication V, where the aim was to explain both the business model change at the company level and the wider socio-technical transition to sustainability. A conceptual paper was constructed on the relevant literature from the fields of corporate sustainability, business models, and system transition. First, the main concepts, sustainability, the business model, and system transition were identified. Second, the literature review was conducted. The Scopus database and the following keywords and their combinations were used to find relevant articles: “business model”; “sustainability”; “transition management”; “system transition”; and “systemic change”. Scopus is an extensive database and probably the best tool available for literature searches, particularly for articles published after 1995 (Falagas et al., 2008). Third, the constructive research approach was used to synthesise the findings from the previous literature and to develop the integrative frameworks (Denyer and Tranfield, 2006).

3.3 Quality of the research

The classic criteria for evaluating research are reliability, validity, and objectivity. Several problems with the use of classic evaluation criteria in qualitative research have generated novel ways for its evaluation, such as evaluating *trustworthiness* through the following four aspects: credibility; transferability; dependability; and confirmability (Bryman and Bell, 2007; Eriksson and Kovalainen, 2016; Flick, 2014; Lincoln and Guba, 1985).

Credibility, which parallels internal validity, refers to how accurately interpretations made from the data represent the views of the informants and the degree to which the results appear to be an acceptable representation of the data (Bryman and Bell, 2007; Silverman, 2010). It relates to ways of showing that the work is trustworthy by concerning the logical links between data observations and the conclusions drawn from them (Eriksson and Kovalainen, 2016). Credibility can be improved through triangulation, which refers to a combination of different methods, theories, data, and/or researchers in the study of one issue (Flick, 2014), and respondent validation, which means checking the conclusions with the informants (Bryman and Bell, 2007). In this study, a triangulation of methods and data sources has been used to create validity. Respondent validation was employed in all the publications to some extent. The findings of Publications III and IV were verified with the experts who attended to the studies, as all informants were able to comment on the findings. The findings of Publications I, II, III, and IV were presented at academic conferences, and all the individual publications have undergone a review process.

Transferability, which parallels external validity, refers to the extent to which the findings can be applied to other contexts. A qualitative study format assumes at least some extent of context-specific findings and thus does not aim to generalise the findings (Bryman and Bell, 2007). In the context of qualitative research, transferability or generalisability is often therefore considered more broadly to determine if the findings are relevant and useful for potential users in other contexts. In this study, the transferability of the findings was increased by using purposive sampling (Creswell, 2013) for selecting cases. None of the findings in this study focused on a single industry or a specific case, and the results from Publication II were applied successfully in Publication I in a different context that increased transferability.

Dependability, which parallels reliability, refers to the study's quality control. Dependability was increased by offering information about the research process (Bryman and Bell, 2007) and showing that the research process had been logical, traceable, and documented (Eriksson and Kovalainen, 2016). This was done to ensure the research's replicability. In this study, research consistency was ensured by deriving the research design and further research methods from the aim of the research and research questions. Furthermore, to increase the dependability, the research process was clearly depicted, and all the research data, both raw data and different analyses, was stored systematically.

Confirmability, which parallels objectivity, focuses on how well the study is free from researcher bias (Bryman and Bell, 2007). It is about linking findings and interpretations to the data in ways that can be easily understood by others (Eriksson and Kovalainen, 2016). In this study, confirmability was achieved by explaining the data collection and data analysis methods clearly and providing a chain of evidence to readers that logically led to the stated conclusions (Edmondson and McManus, 2007).

4 Summary of the publications and their key results

This chapter presents the findings and contributions made by each of the publications. Each has a distinct focus that aims to answer the main research question presented in the first chapter: *How is system-level sustainability advanced through sustainable business models?* The last sub-section presents a summary of the findings and their contribution to the theoretical discussion of the thesis.

4.1 Publication I

Stakeholder conflicts in sustainable value creation: A framework for analysing business model choices towards sustainability from value destruction perspective

4.1.1 Background and objectives

The objective of the first publication was to investigate sustainable value creation and companies' contributions to sustainable development mainly through value outcomes, i.e. value perceived by multiple stakeholders. An understanding of sustainable value creation is essential for targeting SDGs (United Nations, 2019). SBMs aim to create monetary and non-monetary value for a broad range of stakeholders (Bocken et al., 2015; Yang et al., 2017a), including society and environment (Evans et al., 2017; Stubbs and Cocklin, 2008). However, what is beneficial for one stakeholder may be harmful to another (Brennan and Tennant, 2018), leading to value destruction (Yang et al., 2017a) instead of sustainable value created. Most research on SBM innovations has focused on designing sustainable value propositions (Baldassarre et al., 2017; Kristensen and Remmen, 2019; Patala et al., 2016) and how business models create sustainability benefits, but much less attention has been paid to the potential conflicts business models may create among multiple stakeholders (Biloslavo et al., 2018) and perceived value outcomes. Overall, SBM studies still lack a true systemic perspective (Bocken et al., 2019; Freudenreich et al., 2019), and no comprehensive analysis or framework for sustainable value creation exists. The aim was to propose a framework that can help companies investigate the stakeholder value impacts of SBMs and reveal potential stakeholder conflicts leading to value destruction to guide companies to understand the consequences of their sustainability actions and develop true SBMs (Dyllick and Muff, 2016; Upward and Jones, 2016).

4.1.2 Main findings

The findings from the SBM and corporate sustainability literature and an analysis of the twenty SBM cases revealed that sustainable value creation analysis (relating mainly to value outcomes) should include: 1) environmental, social, and economic perspectives on value; 2) scientific explanations for sustainable value; 3) value perceived by different stakeholders; 4) different timeframes; 5) both the value creation and value destruction perspectives; 6) the relationship between business model choices and sustainable value

created or value destruction; and 7) the systemic perspective and boundary setting. The proposed managerial sustainable value creation analysis framework considers all these aspects. According to the systemic perspective, boundary setting, and the view of multiple stakeholders, the framework consists of different levels: the company; customers; the business network/environment (e.g. supply chain partners, other business partners, investors, research and development, competitors); society (e.g. citizens, government, authorities, political organisations, media); and the environment as an independent stakeholder (e.g., Bocken et al., 2015; Dyllick and Muff, 2016; Evans et al., 2017; Schaltegger et al., 2016a) covering socio-technical and socio-ecological systems. The framework links sustainable value creation to SDGs, which are aligned with sustainability principles (Broman and Robért, 2017), and highlights the company's role as part of the larger macro-level system and in effecting systemic change towards sustainable development (Sulkowski et al., 2018). The framework follows the eight concrete steps, from the description of the sustainable value proposition to the analysis of different value forms perceived by different stakeholders and identifying how to avoid value conflicts or decrease value destruction through business model changes.

The findings of the framework testing in fourteen different SBM cases indicated that the framework supported SBM innovation and deepened the understanding of sustainable value creation by broadening perspectives. The framework also examined the connection between business model choices and the sustainable value created for multiple stakeholders and captured by the company. The use of the framework revealed a potential to realise sustainable value propositions, i.e. sustainable value created, but also negative impacts, i.e. value destruction. The method showed that the implementation of sustainable value propositions always includes risks. Based on observations and received feedback, the framework simplifies evaluation and eases decision making by analysing value creation from multiple perspectives and making effects transparent.

4.1.3 Main contributions

The study contributes to the discussion of SBMs by clarifying the concept of sustainable value creation (Bocken et al., 2013; 2015; Yang et al., 2017a; 2017b). First, it distinguishes between the concepts of sustainable value creation processes that consider the activities and resources involved, and the value outcomes that consider how the value is perceived by multiple stakeholders. Furthermore, it divides value outcomes into sustainable value created and value destruction. Second, the study examines the multifaceted nature of sustainable value creation by bringing together the multiple perspectives on sustainable value and demonstrating value destruction from a multi-stakeholder perspective. Third, the study proposes a multidimensional, systemic, and dynamic approach to the assessment of SBMs and sustainable value creation. The proposed framework provides premises for a more detailed SBM design and the creation of specific guidelines for the implementation of sustainable value propositions and measures for the analysis of the system-level sustainability impact of SBMs. Fourth, the study examines the connection between business model choices and sustainable value created for multiple stakeholders and captured by the company, which is investigated in

detail in Publication II. From the managerial perspective, a framework can help managers evaluate their sustainable value propositions, value creation, and business model choices, and it can be used either as a guiding tool in the SBM innovation process or as a qualitative assessment tool in evaluating realised sustainability impacts.

4.2 Publication II

Analysing business model choices and sustainable value capturing: A multiple case study of sharing economy business models

4.2.1 Background and objectives

The objective of the second publication was to reveal the differences between sustainable value propositions and sustainable value actually created and value captured. Furthermore, the aim was to analyse the relationships between business model choices and sustainable value creation. The study investigated sharing business models as examples of SBMs. Sharing business models are driven by economic, social, and environmental benefits, such as more efficient and sustainable use of under-utilised resources and the creation of deeper social connections between people (Heinrichs, 2013), but sharing business models have also been criticised, and it is not self-evident that the goals of sustainability are achieved (Malhotra and Van Alstyne, 2014).

4.2.2 Main findings

The findings from the twenty sharing business models revealed twenty-two general sustainable value propositions for multiple stakeholders (customers, business ecosystem actors, society, and the company itself), which implies that sharing business models have the potential to enhance system-level sustainability. These sustainable value propositions were the potential sustainable values different stakeholders aimed to perceive. The identified key sustainable value propositions were: 1) economic value – cost savings, income, convenience and practicality, accessibility, profit, strong customer relationships, sustainable image, wealth, and equality; 2) environmental value – sustainable consumption more efficient use of resources, eco-effectiveness, the sustainability and liveability of the environment, and; 3) social and psychological value – social interaction, emotional value, and wellbeing. However, the study also revealed negative value outcomes. It is not self-evident that sustainable value propositions are delivered, created, and captured in practice, and from the multi-stakeholder perspective, sustainable value creation may also lead to value destruction. The identified key negative value outcomes were: price issues; trust and safety issues; limited availability; a lack of a critical mass of people; instability and hard competition; cannibalisation; legal issues; ecological and social harm; and missed sustainable value.

The study further revealed nine general business model attributes that affect sustainable value created for multiple stakeholders (or value destruction) and value captured by the

company (the service provider). These business model attributes are: 1) the interaction model (peer-to-peer, business-to-customer); 2) offering (a shared good or service, temporary/permanent access to a good/service, service type); 3) geographic scope (global, regional, local); 4) market orientation (profit-driven, mission-driven; 5) value network (partnering, system-level thinking); 6) the trust building mechanism (review system, booking procedure and payment system, rules, guarantees, and insurances); 7) the form of compensation (monetary, non-monetary); 8) the revenue model (service/commission fee, membership/subscription (flat and tiered), pay-per-use, freemium); and 9) the pricing model (pricing mechanisms and rules). For example, within goods sharing, Rent the Runway encourages people to rent clothes instead of buying, but it also encourages its users to choose a membership model that allows unlimited swaps, leading to increased cleaning, packaging, and transportation.

4.2.3 Main contributions

The study makes two main contributions to the discussion of SBMs (Bocken et al., 2014; Evans et al., 2017; Yang et al., 2017a; 2017b). First, the study shows that it is not self-evident that sustainable value propositions are delivered and captured from the multi-stakeholder perspective. The study explains the differences between sustainable value propositions and the sustainable value actually created for multiple stakeholders and captured by the company. Second, the study explains that every business model choice matters by demonstrating the relationships between business model choices and sustainable value created and captured. From the managerial perspective, managers who are planning to build their business models in the direction of the sharing economy and sustainability can explore their business models through the frameworks and examples presented in the study.

4.3 Publication III

Revealing the sustainable value creation and value capture potential with a multicapital approach

4.3.1 Background and objectives

The objective of the third publication was to clarify sustainable value creation and especially the value capture potential of the company. An understanding of value capture, which represents the value that the company generates for itself from its value proposition (Abdelkafi and Täuscher, 2016), is vital for the successful implementation and diffusion of SBMs. Value creation is a prerequisite for value capture, yet value capture is a necessary driver for a company to engage in value creation. Even if the value capture potential exists, it may not be fully visible for companies, because the value captured often tends to be intangible (Morioka et al., 2018b). This raises a need for research on how companies can translate sustainable value created for the other stakeholders into captured value for themselves.

4.3.2 Main findings

Based on the previous scientific literature on SBMs and corporate sustainability, as well as practice-related business studies, the study summarised the list of sustainable value creation potential and value capture potential. Sustainable value creation potential refers to the various sustainable value forms companies aim to create for multiple stakeholders. Value capture potentials describe how part of the value generated for stakeholders can be transformed into value useful for the company (Geissdoerfer et al., 2018). The study further applied the multicapital approach (McElroy and Thomas, 2016). The identified value potentials represent different types of vital capital (economic (financial and non-financial), manufactured, intellectual, human, social and relationship, and natural) and the three dimensions of the TBL. Through an empirical case concerning the sustainability strategy work of a Finnish horticultural company, the study demonstrated that SBMs' value creation and value capture potential, assessed in multiple capital, are greater compared to more traditional business models focusing on customer value and profit maximisation alone. The study revealed that the sustainable value creation potential perceived by multiple stakeholders was often translated indirectly into value capture potential by the company. A long-term perspective is therefore needed. However, realised value capture motivates the creation of even more sustainable value, leading to a virtuous circle (Casadesus-Masanell and Ricart, 2011): the positive effects of implementing sustainability activity encourage an even greater increase in sustainability efforts.

4.3.3 Main contributions

The study contributes to the discussion of SBMs by clarifying the concepts of sustainable value creation for multiple stakeholders and especially the company's value capture by providing a more detailed categorisation of different value forms, i.e. a summary of sustainable value creation and value capture potential. Second, the study demonstrates the sustainable value creation and value capture potential of the SBM through the multicapital approach. (Abdelkafi and Täuscher, 2016; McElroy and Thomas, 2016; Schaltegger et al., 2012) It concretises sustainable value creation, when the potential impacts are indicated for certain capital. Their value form is therefore easier to identify and further translate into value capture potential. Third, the study adopts systems thinking and the idea of virtuous circles in business models to identify positive feedback loops between sustainable value creation and value capture that continuously strengthen SBM development. From a managerial perspective, this study explains the value capture potential of sustainable value creation to foster the adoption of more SBMs.

4.4 Publication IV

Analysing barriers to sustainable business model innovations: Innovation systems approach

4.4.1 Background and objectives

The objective of the fourth publication was to examine how the transition to SBMs can be achieved. Specifically, the aim was to identify the key barriers to SBM innovation and explain how to remove the existing barriers. Business model innovation conventionally focuses on companies' internal strategic activities, but these activities are greatly affected by the institutional environment in which the companies operate (Zott and Amit, 2007). Institutional theory and an innovation system approach were therefore adopted to examine the structural and cultural barriers to SBM innovation and to understand the successful process of SBM diffusion.

4.4.2 Main findings

The findings of the study were based on a Delphi study consisting of a panel of forty-two experts, themed expert interviews, and two Delphi rounds. The findings revealed nineteen unique barriers to SBMs, which can be classified in three categories: 1) regulatory barriers; 2) market and financial barriers; 3) behavioural and social barriers. It is noteworthy that the availability of new technologies was not seen as a barrier to SBM innovation. Instead, changes in regulation mechanisms, consumer habits, and attitudes and values increased knowledge of the underlying logics of SBMs, and stakeholder pressure was observed. These barriers can be overcome by the seven innovation system functions: entrepreneurial activities; knowledge development; knowledge diffusion through networks; market formation; guidance of the search; resources mobilisation and the creation of legitimacy.

Entrepreneurial activities can challenge the status quo and overcome incumbent business models. Entrepreneurs should be encouraged, for example, by regulations that also support potentially risky experimentation and pilot projects, and new sustainability-oriented platforms and coalitions where entrepreneurs can collaborate and form new partnerships. *Knowledge development and diffusion* are vital functions for advancing the understanding of SBMs in creating sustainable business. Companies need to be able to understand the meaning of sustainable value creation and its relationship with sustained competitive advantage, and policymakers should understand the precise impacts of regulatory mechanisms on company activities and their further sustainability impacts. Universities, research centres, and educational institutions play an important role in advancing the knowledge of sustainability, as well as diffusing this knowledge through educational activities. Cooperation between companies, government organisations, consumers, and other stakeholders is key to the knowledge diffusion. *Guidance of the search* and *resources mobilisation* refer to the reasonable use of limited resources. Consistent strategies and clear goals, at least at national level, that guide innovation activities towards sustainability are needed. Forming collaborative alliances and coalitions increases the amount of available resources for specific innovations. Favourable regulations, sustainability standards, tax incentives, functional local home market, sustainability-oriented pricing, and public procurement practices can all *form markets* for new SBMs. As current business models often cause resistance to change,

creating legitimacy for new SBMs through success stories and increased awareness of the value capture potential and profitability of new SBMs is vital for SBM diffusion. Additionally, behavioural and social barriers can be overcome by promoting the awareness of environmental/social problems in the media.

4.4.3 **Main contributions**

The study advances the understanding of the role of actors from different sectors of society in advancing sustainable business (Bergek et al., 2008; Farla et al., 2012). The study integrates SBM and transition fields contributing to both literature streams. First, the research highlights the collaborative efforts of companies, consumers, policymakers, educators, research institutes, and other stakeholders, especially the importance of well-functioning regulatory frameworks, for SBM innovations. Second, the research underlines the role of voluntary business activities for the diffusion of SBMs. Visionary entrepreneurs are needed to adopt radical new innovations, and the innovation system should support this. The study contributes to the research on innovation systems and socio-technical change by offering an example of how the technological innovation systems (TIS) can also be applied with a broader view of SBM innovations, rather than merely focusing on specific sustainable technologies.

4.5 **Publication V**

Sustainable system value creation: Development of preliminary frameworks for a business model change within a systemic transition process

4.5.1 **Background and objectives**

The objective of the fifth publication was to integrate the business model change at company level and the wider socio-technical transition to sustainability. Dyllick and Muff (2016) identified a significant disconnection between the company, micro-level concepts of corporate sustainability and sustainable business, and the global macro-level concept of sustainable development. Company-level actions make a marginal contribution to global sustainability if corporate sustainability and sustainable development are disconnected. Business model innovations are recognised as a key to the creation of sustainable business and as a bridge between the company and system levels (Boons et al., 2013). Companies are capable of contributing to sustainability through multiple transition pathways (Geels and Schot, 2007; Geels, 2014), when companies can be interpreted as agents of sustainability transitions (Farla et al., 2012). Although the question of how companies can transform their business models towards sustainability is highly relevant for society and management, companies have been slow to adopt sustainability strategies and SBMs. Sustainability transitions are complex and unique because sustainability is a collective good, which means that most sustainable solutions do not offer direct user benefits (Geels, 2011). It is therefore unlikely that SBM will be able to replace existing systems without wider system-level changes, such as changes in

regulatory frameworks and industry-level policies. This study applies business model, corporate sustainability, and transition theories to explain company- and system-level transition to sustainability.

4.5.2 Main findings

The fifth publication took the form of a conceptual paper, and the findings were based on the integration of the following literature streams: business model; corporate sustainability; and sustainability transition. Building on the synergy between corporate sustainability, business model, and system transition literature, the study proposed an *integrative theoretical framework from weak to strong sustainability*. The framework maps different change typologies, from weak to strong sustainability, used in different literature streams: corporate sustainability; business model; and system transition. It shows that despite the scattered terminology, the companies' capability of creating sustainability through agency and sustainable value through business models is acknowledged in different fields. The proposed framework is an outline that employs a variety of terms for similar phenomena, and it may help to reduce the current gap between the literatures of system transition and business models. Furthermore, the study proposed a *tentative framework that integrates business model change and system transition*. The framework shows that companies can play a dualistic role in advancing system-level sustainability. First, by adopting the sustainable value approach, companies contribute to sustainability by creating economic, environmental, and/or social value for multiple stakeholders. Second, companies that engage in sustainable value creation challenge the current system and act as agents of sustainability transition (i.e. niche pressure). However, individual companies are unable to achieve system-level goals, i.e. system-level sustainability, on their own. For this reason, bidirectional actions within companies and the wider system in which companies operate are also highlighted in the proposed framework. Regime pressure can positively or negatively affect both value creation potential and the value actually created.

4.5.3 Main contributions

The fifth publication contributes to the SBM literature by applying transition literature to explain both the business model change at the company level and the wider socio-technical transition to sustainability (Bidmon and Knab, 2018; Boltion and Hannon, 2016; Sarasini and Linder, 2018; Schaltegger et al., 2016b). This study contributes conceptually to the existing SBM and sustainability transition literatures in three ways. First, the study explains how the concept of sustainable value creation can be interpreted as a bridge to sustainable business and later as a component of the larger system-level transition to sustainability. Sustainable value creation is a process through which companies act as agents of sustainability transitions. Second, the findings of the study imply that the lack of integration between the company (the business model shift towards sustainability) and system (sustainability transition) levels still exists. To adopt SBMs – and hence sustainable value creation – companies need support from the system level. Since the

current regime strongly pressurises companies' operations, for example, via legislation, a sustainable regime would assist companies in adopting SBMs. To achieve true system-level sustainability, more synergies between the system level and business environments are required. Third, the study presents pathways to sustainability in relation to companies in different research disciplines. Different disciplines use scattered and often overlapping terminology to describe the change from weak to strong sustainability. A stronger understanding of overlapping typology while the phenomena remain much the same can ultimately advance the integration of different disciplines. This study provides the premises for the process of bridging the disciplines of SBM and system transition.

4.6 Summary of the findings

In this thesis, the focus was on SBMs in advancing system-level sustainability. Exploring how do companies affect system-level sustainability through SBMs and specifically, through sustainable value creation, but also what motivates companies to shift their business models towards system-level sustainability and the creation of sustainable value, this thesis emphasised the bidirectional interaction between companies and the larger systems in which they operate. All the individual publications of the thesis played an important role in forming its overall contribution. To start with, this thesis clarifies how the concepts of SBM, sustainability transition, sustainable business, system-level sustainability, and sustainable value creation relate to each other. The thesis specifies sustainable value creation, which is part of SBM, as a vehicle through which companies advance sustainable business, as well as system-level sustainability. Hence, sustainable value creation is the central concept of the thesis no less than it is the central topic in the individual publications.

The main research question was divided into two sub-themes: 1) business impacts on system-level sustainability; and 2) enablers for sustainable business, guided by two research sub-questions (SQs): 1) *How do companies affect system-level sustainability through SBMs and specifically, through sustainable value creation?* 2) *What motivates companies to shift their business models towards system-level sustainability and the creation of sustainable value?*

Publications I, II, III ja V focused on the first sub-theme from different perspectives. Publications I, III, and V define the meaning of sustainable value creation from slightly different perspectives. Publication I divides sustainable creation into the value creation process and value outcomes, and presents different economic, environmental, and social value forms, and especially attends to the negative side of sustainable value creation. Publication V takes a broader perspective, presenting the concept of "sustainable system value creation", which highlights that a company is merely part of the overall value creation. Publications I and III propose tools – the multicapital approach (III) and the framework from value destruction perspective (I) – to assess sustainable value creation, i.e. value outcomes. Publication I further examines the connection between business

model choices and sustainable value created for multiple stakeholders and captured by the company, and Publication II investigates this relationship in detail.

Publications III, IV and V focused on the second sub-theme from different perspectives. Publication III explains how companies can translate sustainable value created for the other stakeholders into the captured value for themselves by applying the multicapital approach. Publications IV and V take a broader perspective and explain how the wider socio-technical system hinders or supports the adoption of SBMs and sustainable value creation. Publication IV identifies various barriers to the advancement of the SBM in the regulatory, market, financial, and behavioural and social dimensions, and examines multiple actors' roles (within innovation system) in overcoming the barriers. Publication V integrates the company- and system-level shifts towards sustainability required to advance true system-level sustainability. Table 12 presents a summary of each publication's findings and its contribution to the overall purpose of the thesis.

Table 12. Main findings and contributions of the individual publications

Publication and research SQ(s)	Main findings	Contribution to advancing SBM and sustainability transition
I *How do companies affect system-level sustainability through SBMs and specifically, through sustainable value creation?*	• A framework for sustainable value creation analysis, comprised of: 1) environmental, social, and economic value forms; 2) scientific explanations of sustainable value; 3) the value perceived by different stakeholders; 4) different timeframes; 5) both the value creation and value destruction perspectives; 6) the relationship between business model choices and sustainable value created or value destruction; and 7) the systemic perspective and boundary setting • **Companies affect system-level sustainability by considering the multifaceted nature of sustainable value creation.**	• Examining the multifaceted nature of sustainable value creation • Connecting sustainable value creation with the SDGs. • Demonstrating stakeholder conflicts and value destruction. **Attention to negative consequences/conflicts is required to achieve true sustainability/SDGs/net positivity**. • Examining the connection between business model choices and sustainable value created for multiple stakeholders and captured by the company.
II *How do companies affect system-level sustainability through SBMs and specifically, through sustainable value creation?*	• 22 general sustainable value propositions for multiple stakeholders • Negative value outcomes • 9 general business model attributes that affect sustainable value created for multiple stakeholders (or value destruction) and value captured by the company	• Examining the differences between sustainable value propositions and sustainable value actually created for multiple stakeholders and captured by the company. **It is not self-evident that sustainable value propositions are delivered and captured from the multi-stakeholder perspective**.

	• **Companies affect system-level sustainability by examining the differences between the value propositions and value actually created and considering every business model choice.**	• Examining how business model choices affect created and captured value. **Every business model choice matters**.
III *How do companies affect system-level sustainability through SBMs and specifically, through sustainable value creation, and what motivates companies to shift their business models towards system-level sustainability and the creation of sustainable value?*	• Different value concepts related to SBM: sustainable value creation potential and value capture potential • A multicapital perspective of sustainable value creation and value capture • **Companies affect system-level sustainability by identifying the sustainable value creation potential in multiple capitals.** • **Identifying value capture potential motivates companies to shift their business models towards system-level sustainability.**	• Clarifying the sustainable value creation and value capture potential. **Value creation is a prerequisite for value capture, yet value capture is a necessary driver for a company to engage in sustainable value creation**. • Demonstrating the value creation and capture potential of the SBM through the multicapital approach. **SBMs' value creation and value capture potential, assessed in multiple capital, is higher compared to more traditional business models focusing merely on customer value and profit maximisation**.
IV *What motivates companies to shift their business models towards system-level sustainability and the creation of sustainable value?*	• 19 barriers to SBM innovations, representing: 1) regulatory barriers; 2) market and financial barriers; and 3) behavioural and social barriers • Different innovation system functions can act to remove or decrease the identified barriers to SBM innovation • **The wider support from other actors in business environment motivates companies to shift their business models towards system-level sustainability.**	• Promoting a strategic view of the SBM by identifying the barriers which can hinder the diffusion of new SBMs. **This is not a question of new technologies; it is more a question of supportive business environment, e.g. regulation mechanisms, and attitudes and values**. • Examining the multiple actors' roles (within the innovation system) to overcome the barriers. **A systemic approach is required for the diffusion of SBMs**.
V *How do companies affect system-level sustainability through SBMs and specifically, through sustainable value creation, and what motivates companies to shift their business models towards system-level*	• An integrative theoretical framework, combining the building blocks of transition management, SBMs, sustainable value creation, and corporate sustainability levels • Integrating business model change and system transition • **Companies affect system-level sustainability by identifying**	• Promoting a systemic view of the SBM by integrating the system level (system transition) and company level (business model change). **Stronger integration between the company and system levels is required to achieve true system-level sustainability**.

sustainability and the creation of sustainable value?	**their role as agent in sustainability transition.** • **The wider socio-technical transition to sustainability motivates companies to shift their business models towards system-level sustainability.**	

5 Conclusions

Building on the previous SBM research, this thesis was motivated by the following observations: *SBMs have the potential to create sustainable business and contribute to sustainable development goals and, at the same time, promote the long-term competitive advantage of the company. However, this requires that companies understand complex concepts: the business model and sustainability; and the surrounding business environment supporting the adoption of SBMs. Furthermore, this requires interaction between the company and system levels.*

Furthermore, following the identified research gaps, research questions were formulated. The main research question was: *How is system-level sustainability advanced through sustainable business models?* It was divided into two sub-themes: business impacts on system-level sustainability; and enablers for sustainable business. These sub-themes were guided by two research sub-questions: 1) *How do companies affect system-level sustainability through SBMs and specifically, through sustainable value creation?* 2) *What motivates companies to shift their business models towards system-level sustainability and the creation of sustainable value?*

These research questions were answered through the findings of the five individual publications discussed in Chapter Four and listed in Part II of the thesis. This thesis began with an introduction, which detailed the study's research background, research gaps, objectives, and conceptual background. The second chapter covered the theoretical background and presented insights from the SBM literature and systemic change theories applied in management literature and relevant to the thesis topics. Next, the research approach and methodological choices were explained. Part I of this thesis ends with this fifth chapter, which discusses the study's contributions, limitations, and potential further research directions.

5.1 Contributions

This section discusses the theoretical contributions, and managerial and policy implications of the thesis. As the main theoretical background for the thesis lies in the SBM research field, the main contributions also come from this field. By seeing SBM research as an integrative field (Lüdeke-Freund and Dembek, 2017), this thesis also applies views from the corporate sustainability, traditional business model, and system transition fields, and the findings thus offer contributions to the research in those fields.

5.1.1 Theoretical contributions

Based on the findings of the individual publications and the understanding gained during the research process, this thesis makes four main contributions to the existing literature. These contributions are summarised in Figure 10 and then discussed in detail.

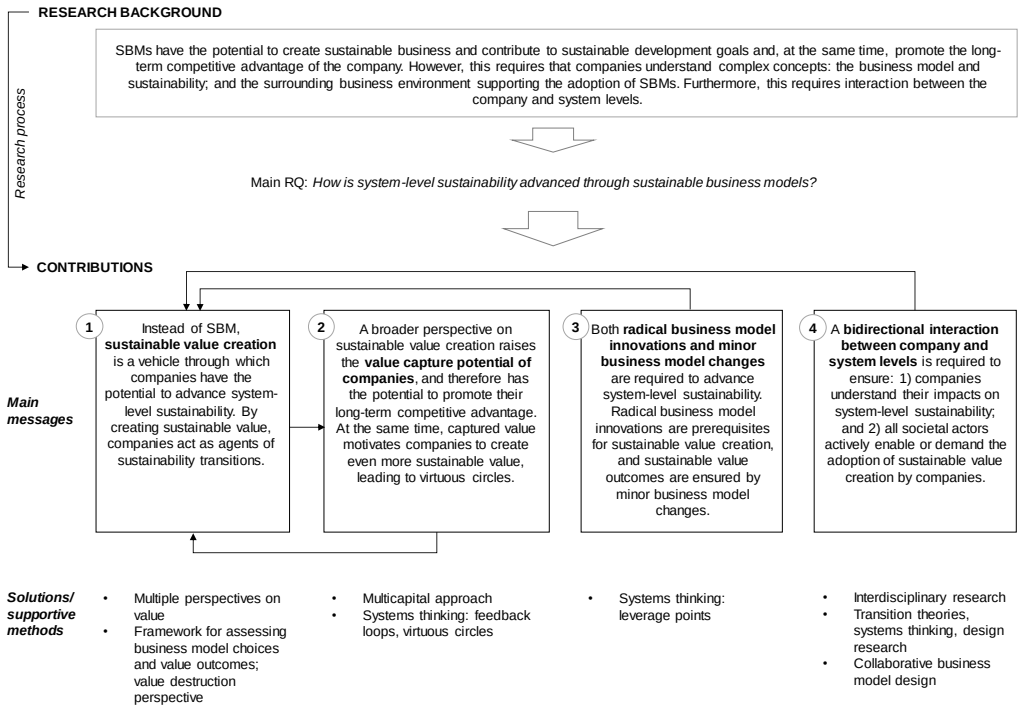

Figure 10. Contributions of the thesis

In the previous literature, SBMs are noted as vehicles for advancing sustainability (e.g. Boons and Lüdeke-Freund, 2013; Carayannis et al., 2015; Long et al., 2018; Lüdeke-Freund and Dembek, 2017). This thesis specifies that *instead of the SBM, sustainable value creation is a vehicle through which companies have the potential to advance system-level sustainability. By creating sustainable value, companies act as agents of sustainability transitions*. Business model analyses are sometimes too static and company-oriented, whereas value creation refers to more dynamic value creation processes and value outcomes, i.e. value actually created. Furthermore, sustainable value creation is a multifaceted concept, and it broadens the perspective compared to a more traditional view of value creation. This is *the first main theoretical contribution*. This requires a systemic perspective and new perspectives on value as discussed in Publications I, III and V. First, sustainable value refers to multiple economic, environmental, social, and psychological forms of value. Second, sustainable value creation should be divided into the value creation process and value outcomes. The value creation process refers to the company's and its value network's activities and resources for creating value outcomes, i.e. business model choices, which are discussed further in the third contribution. In this thesis, the focus was mainly on value outcomes, which refer to positive (i.e. sustainability benefits) and negative economic, environmental, and social (including psychological aspects) impacts perceived by different stakeholders. As the value is perceived relatively by multiple stakeholders who also have divergent interests,

tensions, trade-offs, and conflicts always exist. Sustainable value creation potential in the form of economic, environmental, and social value, and divided into the value creation process and value outcomes, is summarised in the table in Publication I.

To assess sustainable value creation and how the company advances system-level sustainability through value outcomes, the goal must be defined. Defining a goal requires the defining of the concept of sustainability. If sustainability goals, such as comparisons relative to a baseline year, current best practice, or a company's own short-term targets, are based on the benchmarks, there is a risk that incremental and in absolute terms, even ineffective improvements, are seen as progress towards sustainability (Dyllick and Rost, 2017; Kurucz et al., 2017). Recent studies on sustainable value creation have proposed that the assessment should be scientifically based, using, for example, the four sustainability principles (Robèrt et al., 2012), planetary boundaries (Rockström et al., 2009), or laws of thermodynamics. From a managerial perspective, these scientific principles sound quite abstract. Therefore, SDGs (United Nations, 2019) are used to describe the goal in the *framework for analysing business model choices towards sustainability from the value destruction perspective* proposed in Publication I. The proposed framework for assessing business model choices and value outcomes highlights the fact that considering the negative side of sustainable value creation is at least as important as considering the positive impacts.

The second contribution of this thesis follows the first: *A broader perspective on sustainable value creation raises the value capture potential of companies, and therefore has the potential to promote their long-term competitive advantage. At the same time, captured value motivates companies to create even more sustainable value, leading to virtuous circles*. The value capture represents the value that the company generates for itself from its value proposition and value creation activities (Abdelkafi and Täuscher, 2016). As sustainable value is a multifaceted concept, the assessment of sustainable value creation and further value capture is complex. New approaches are therefore needed. In Publication III, the multicapital approach (McElroy and Thomas, 2016), combined with systems thinking (Meadows, 2008), is proposed to explain how sustainable value creation promotes the long-term competitive advantage of the company. The multicapital approach is proposed to broaden the view from the generation of financial capital and shareholder benefits to a consideration of the impacts on society, the environment, and other forms of vital capital: non-financial economic; manufactured; intellectual; human; social and relationship, and natural. Capital-based philosophy is not itself a new idea, but it is rare in SBM research. A summary of sustainable value creation and value capture potentials expressed in different capital is presented in Publication III. When the potential impacts (sustainable value outcomes) are indicated in certain capital, their value forms are more easily identified and further translated into value capture potential. Furthermore, the interplay between value capture potential and value actually captured is demonstrated though the multiple capital and systems thinking approach. Realised value capture motivates companies to create even more sustainable value, leading to virtuous circles (Casadesus-Masanell and Ricart, 2011) which describe how the positive effects of

implementing sustainable value creation encourage an even greater increase in sustainability efforts, i.e. generating positive feedback loops.

In the previous literature, the innovations required for sustainable development are linked to higher levels of business model innovation and are beyond incremental business model adjustments (Boons et al., 2013; Johnson and Suskewicz, 2009; Pedersen et al., 2018). In this research, the focus was not on the differences between innovation types and business model change levels (Cavalcante et al., 2011; Geissdoerfer et al., 2018; Schaltegger et al., 2012). Initially, this thesis adopted the view that SBMs are innovations that create significantly positive or significantly reduced negative impacts for the environment and/or society. This definition reflects the higher levels of business model innovation and more radical changes compared to more traditional business models, for example, the move from a traditional manufacturing company to the sharing economy. The focus in this thesis was on business model adjustments, improvements, and revisions (which are not linked to radical innovations) within SBMs. In Publication II, twenty sharing business models in four different sectors were analysed by examining how business model choices affected created and captured sustainable value. The findings indicated that it was not self-evident that all sustainable value propositions were delivered, created, and captured in reality, and every business model choice mattered. It is not self-evident that sharing business models advance resource-efficiency: two quite similar business models offering shared accommodation may create differing sustainability impacts if they have minor differences in revenue or pricing models, for example.

Both radical business model innovations and minor business model changes are required to advance system-level sustainability. In many industries, radical business model innovations are prerequisites for sustainable value creation. Furthermore, sustainable value outcomes are ensured by business model adjustment and continuous improvement. The first observation is based mainly on the previous literature on SBMs and sustainable innovations. The second observation is based on this research. Radical innovations create opportunities, but they are also essential to attain an adequate level of sustainability. Business models that rely on non-renewable resources cannot be truly sustainable, for example. Although radical innovations enable the shift to sustainability, there is a risk of failing in the details and creating negative side-effects. Minor business model changes such as business model adjustments, revisions, and improvements are therefore essential, as they try to cure the flaws in radical innovations. SBM literature has focused more on radical innovations, but there is also huge potential within business model adjustments. This is *the third contribution* of this thesis. Systems thinking is a suitable approach for investigating how business model choices affect sustainable value creation. Business model elements illustrate leverage points which are points of power and places to intervene in a system (Meadows, 2008). The question concerns how to change the business model to create more sustainability benefits and reduce negative impacts. However, Publication V indicates that an individual company's business model can reflect only part of the overall value creation, but it can be seen as a unit that serves a certain function in the broader system, thereby enabling system value creation. Companies can be interpreted as individual agents that trigger transitions that can

gradually change the wider business environment and eventually, the whole system. This leads to the next contribution.

The fourth contribution of this thesis follows the previous three contributions by highlighting the need for company- as well as system-level approaches: The bidirectional *interaction between company and system levels is required to ensure: 1) companies understand their impacts on system-level sustainability; and 2) all societal actors (e.g. government representatives, policymakers, interest groups, consumers) actively enable or demand the adoption of sustainable value creation by companies.* Overall, this is the main contribution of this thesis, as it enables sustainable value creation. First, system-level sustainability is a macro-level concept. Hence, company- or industry-level analyses do not reflect the true sustainability impacts of SBMs. Second, in the face of grand challenges, broader sustainability transitions, in which companies can act as important agents, are needed. Third, the system plays an important role in advancing the adoption of SBMs and sustainable value creation: it can either hinder or support the process. However, as observed in Publications IV and V, a lack of integration between company- and system-level sustainability remains an issue. Thus, this contribution prompts a call for interdisciplinary research. Thus far, there are minor studies that integrate business and management research (SBMs) and system transition research (sustainability transition) (Köhler et al., 2019). Transition research has focused on single systems, e.g. energy transition, but not the rationale of how individual companies can enhance sustainability transitions through their business models, whereas business research has mainly focused on company-, industry-, or network-level analyses. This thesis represents an early attempt to integrate SBM research and sustainability transition research by emphasising the bidirectional interaction between companies and larger systems. It is fruitful to apply the theories and frameworks used in system transition studies to management research. For example, in Publication IV, the technological innovation system (TIS) approach is applied unusually to gain an understanding of the successful process of SBM innovation diffusion, rather than technology development. In Publication V, a multi-level perspective (MLP) is applied to bridge the gap between company-level business model change and system-level transition, although the MLP is criticised for its treatment of individual actors (Geels, 2011). In contrast, management frameworks and design research, which are adopted quite widely in business model research but not in transition research, build the bridge between these fields. However, in sustainability transition, the focus is mainly on the socio-technical system rather than the socio-ecological system. Further integration with natural sciences is also needed to advance system-level sustainability within the limits of planetary boundaries. Systems thinking offers a more holistic lens through which to examine the role of companies within socio-ecological systems (Williams et al., 2017). At a more practical level, the collaborative business modelling approach (Karlsson et al., 2018; Rohrbeck et al., 2013), in which people from various backgrounds work together, can be used to create more systemic and sustainable innovations.

5.1.2 Managerial and policy implications

This thesis also contains managerial and policy implications. It offers guidelines for business managers coping with the designing, developing, implementing, and monitoring of SBMs and sustainable value creation. The findings also provide guidelines for the public sector and policymakers, as well as the broader group of stakeholders, such as individuals as consumers. These are detailed below in the form of key recommendations.

Define what system-level sustainability means to your business.

To start with, the first managerial message highlights the need to internalise the concept of sustainability. Sustainability is commonly used as a buzzword, not a genuine target. Companies' internal activities, such as sustainable supply chain management, resource and energy efficient production, and sustainability reporting, are important, but these activities are seen today as business as usual, not true sustainability. Increasing environmental, social, and economic problems require solutions through which companies create sustainability benefits, not just minimise negative impacts. The concept of system-level sustainability is therefore used in this thesis. System-level sustainability refers to conditions that enable a good quality of life. For companies, this means respecting planetary boundaries (Rockström et al., 2009), setting business objectives based on the science-based sustainability principles (Robèrt et al., 2012) related to natural cycles and the root causes of unsustainability, and targeting SDGs (United Nations, 2019). The aim is that the factual data from the natural sciences, i.e. science-based sustainability principles, will guide companies' strategy development process and further SBM development towards system-level sustainability. Concretely, companies can utilise the planning procedures of the Framework for Strategic Sustainable Development (FSSD) (Broman and Robèrt, 2017), which provides comprehensive and generic sustainability principles, but also a logical process for integrating these principles into strategic planning (Baumgartner and Rauter, 2017). Companies are also encouraged to adopt the multicapital approach (McElroy and Thomas, 2016) to broaden the view from shareholder benefits and the generation of economic capital to considering the impacts on society and the environment, and other forms of vital capital, as presented in Publication III.

Focus on sustainable value creation, value outcomes, and how multiple stakeholders perceive value, not just sustainable value propositions.

While the first message is related to internalising the concept of system-level sustainability and setting the targets at strategy level, the second message focuses on the role of SBMs, sustainable value propositions, and sustainable value creation in translating the sustainability strategy into practice. The value propositions are at the heart of the traditional Business Model Canvas (Osterwalder and Pigneur, 2010), which is the commonly used tool for business model design. Sustainable value propositions (Patala et al., 2016) are important, because they concretise the business model's purpose and attract customers. However, they more closely resemble marketing messages, and it is not self-evident that sustainable value propositions are delivered and captured in reality. For

example, ridesharing is argued to help to reduce the environmental load and result in the more efficient use of resources. However, it may also increase the overall amount of travelling. It is therefore important to focus on sustainable value creation, and how multiple stakeholders actually perceive value in reality. Companies should consider complex cause and effect relationships, and adopt a systems thinking approach to assess their sustainability impacts from the perspectives of the multiple dimensions of sustainability, multiple stakeholders, and value creation and destruction within different timeframes.

Focus on every single business model choice.

The third managerial message highlights that every business model choice matters. This recommendation follows the third theoretical contribution, presented in Section 5.1.1. To advance system-level sustainability, companies should adopt new radical business model innovations (e.g.: substituting the use of finite resources; moving from car selling to car sharing; moving from selling strip lights to selling a guaranteed level of indoor lighting or visual comfort), but they should at the same time remember minor business model changes and continuous improvement (e.g.: improving resource-efficiency within the use of renewable resources; preventing rebound effects through carefully planned pricing models within car sharing; and educating customers about the sustainable use of lighting when selling performance, such as a guaranteed level of indoor lighting). Radical business model innovation enables sustainable value creation, and continuous monitoring and minor business model adjustments ensure sustainable value outcomes. Sustainable development, like business model innovation or development, is a continuous process.

Pay attention to the negative consequences of sustainable value creation.

This fourth message follows the second managerial message and is aimed at both managerial and policy audiences. Paying attention to the negative consequences of sustainable value creation is a prerequisite for advancing system-level sustainability. For example, although Airbnb boosts tourism in new areas and generates revenue for locals, it acts as a partial substitute for hotel nights, and rents increase in neighbourhoods where home sharing is popular (Frenken and Schor, 2017). In the most popular cities, like Barcelona and San Francisco, Airbnb has chased existing tenants away, because regulation has not had time to address the new business model. By collaborating with businesses and research, and following early indicators, policymakers may be able to create a more proactive policy. *A framework for analysing business model choices towards sustainability from the value destruction perspective*, presented in Publication I, can help managers evaluate their sustainable value propositions and value creation, as well as business model choices. The framework can be used either as a guiding tool in the SBM innovation process or as a qualitative assessment tool in evaluating realised sustainability impacts. To this end, paying attention to negative consequences and thinking paradoxically may lead to the recognition of new opportunities.

Build a favourable environment and regulatory framework to encourage SBM innovations and sustainable value creation.

The second policy implication highlights the role of supportive regulation. The findings in Publication IV indicate that besides market, behavioural, and social barriers, regulation is a major barrier to SBM innovations, and at the same time, regulation plays a key role in overcoming barriers. Effective regulations guide companies to shift their business models towards sustainability by creating limits and costs for negative environmental and social impacts, related, for example, to waste charges, environmental protection taxes, or in Finland, recent discussions about creating a selling permit system for fuels. Supportive regulation guides companies by creating incentives for improvement and space for innovativeness as well as removes barriers (e.g. relating to waste reprocessing regulations). Creating a favourable environment and finding a balance between different policies is not an easy task. It may require structural change, successful foresight, the integration of national and international regulation, and courage to lead the way (e.g. Germany's Energiewende). Whatever course is taken, businesses appreciate consistency and a long-term outlook that can give companies the confidence to adopt new business model innovations. Favourable regulation is also flexible, and it supports different options for solving sustainability issues, e.g. within sustainable mobility, where there are many types of technology and business model, such as electric and hybrid vehicles, biofuels, public transport, and car sharing.

Commit to system-level sustainability targets, and participate and collaborate in enhancing virtuous circles.

This final message is for everybody. Advancing system-level sustainability requires the involvement of all parties: businesses; the public sector; policymakers; consumers; researchers; educators; and the media. This is not a question of new technologies; it is more a question of innovative business models, supportive regulation mechanisms, and sustainability-oriented attitudes and values. Businesses can be a great force in improving system-level sustainability by implementing new SBMs, providing sustainable solutions, and creating sustainable value for multiple stakeholders. The public sector can provide businesses with political support, and businesses can lobby for sustainability-oriented policy. Consumer demands play a vital role in guiding how companies change their business models. Consumer acceptance can be advanced by improving the price competitiveness of sustainable products and services compared to unsustainable ones, as high prices are often a barrier to the mass-market appeal of sustainable offerings. In addition, sustainability reports and eco-labels are needed to allow consumers to make sustainable buying decisions. Various parties can together create positive reinforcing loops, i.e. virtuous circles, and accelerate the development towards system-level sustainability. Sustainability is not the responsibility of businesses, policymakers, or consumers: it is the responsibility of everybody. It is worth considering how everyday decisions and actions at work and leisure affect the basis of sustainability: the use of finite resources; the sustainable use of renewable resources; impacts on air, water, and land, as well as health, impartiality, and competence; and meaning-making related to social

aspects. It is also worth considering the influence of positive impacts and how to scale them. As a private person, it is easy to cook vegetarian food for one's own family, offer vegetarian meals to guests at a big birthday party, share recipes on social media, or affect the decision on a business dinner menu, for example. Employees of private companies, the public sector, a research institute or academy, or the media have even more opportunities to promote a vegetarian diet.

5.2 Limitations and suggestions for future research

Naturally, this study has several limitations, which provide interesting avenues for future research. First, there are limitations related to methodological choices. The thesis followed the qualitative research approach, which sets some limitations for generalising results (Bryman and Bell, 2007). Data collection also sets some limitations. The data in Publication II was collected using different sharing business models, and not every kind of SBM archetype (Bocken et al., 2014; 2019) was covered. In Publication V, the data was collected only from the previous literature covering the different literature fields. Empirical data would have added to the findings of this publication. However, the aim of this research was not to test the theory or to build theory, but to explore a relatively new research area and provide a basis for the development of testable hypotheses. Future research might utilise different research approaches, strategies, and methods to test and validate the results and develop them further. For example, mixed methods and quantitative studies based on a larger sample of SBMs might be used to investigate the connections between business model choices and sustainable value created and value captured.

Second, although the focus of this thesis was both on value creation and value capture, one of its important limitations is related to the limited insight it affords on sustainable value creation. Compared to value outcomes, i.e. created sustainability benefits and negative impacts, the value creation process, which is an integral part of sustainable value creation, was less considered. In this thesis, multiple stakeholders were mainly considered as value recipients, not as both recipients and (co-)creators of value in joint sustainable value creation processes (Freudenreich et al., 2019). Furthermore, in this thesis, different tools for assessing sustainable value creation and value captured were proposed. However, these tools are qualitative assessment tools, and they represent early attempts to model and assess complex sustainable value creation and value capture processes from the perspective of multiple stakeholders. The tools present a high-level assessment of sustainable value creation and value capture, and form a basis for future research and the creation of more accurate metrics and analyses to measure actual sustainability impacts (Chandrakumar and McLaren, 2018) and the value capture potential of different SBMs. The concept of "sustainable system value creation", which is promoted in Publication V, needs further investigation, because none of the companies on their own is able to achieve the system-level goals. The business model of an individual company may reflect only part of the overall value creation, but it may be seen as a unit that serves a certain function

in the system, thereby enabling system value creation. This would require a more thorough modelling of the value creation and capture mechanisms in such a system.

Third, the interview and questionnaire data were collected from Finnish markets, and the SBM cases presented companies operating mainly in Europe and the US. Thus, the findings of the thesis are derived from heavily industrialised countries, and do not address SBMs for advancing system-level sustainability in developing countries. However, sustainability is a global and macro-level concept. It would be valuable to investigate how system-level sustainability through SBMs can be increased in developing countries and to compare the findings.

Fourth, the focus of the research is both a strength and a limitation. The focus of this thesis was broad: the aim was to explore the bidirectional interaction between companies and larger systems, and company- and system-level shifts towards sustainability. Arguably, this was an ambitious objective, because it required a multidisciplinary approach and a systemic perspective. This thesis adopted views from the business model, corporate sustainability, and system transition research fields to establish a general view for SBMs in advancing system-level sustainability. However, this study represents an early attempt to integrate SBM and sustainability transition research, and to investigate the bidirectional interaction between a company and a system. It therefore opens up multiple new avenues for further research in this direction. Overall, this thesis suggests that company- and system-level sustainability should be more strongly incorporated in further studies, because the lack of integration acts as a barrier to sustainable development. Studies focusing on both business models and system transition for increasing sustainability are just emerging. There are thus plenty of research opportunities to develop more comprehensive and formal models of the interaction between the company and system levels. This thesis encourages business scholars to adopt transition theories, even those that were originally technology-oriented, to bridge the gap between the company and system levels. Besides the socio-technical approach, the socio-ecological approach is needed to understand the roots of (un)sustainability and ecological resilience.

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Stakeholder conflicts in sustainable value creation: Framework for analysing business model choices towards sustainability from the value destruction perspective

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Stakeholder Conflicts in Sustainable Value Creation

Framework for Analysing Business Model Choices Towards Sustainability from the Value Destruction Perspective

Minttu Laukkanen[1], Janne Huiskonen[2]

[1]*LUT University, minttu.laukkanen@lut.fi*
[2]*LUT University, janne.huiskonen@lut.fi*

Abstract
This study clarifies stakeholder conflicts and concretizes sustainable value creation and business model choices towards sustainability from the value destruction perspective. As contribution, we present a framework that can help companies investigate value impacts of sustainable business models and reveal potential stakeholder conflicts leading to value destruction. The framework is aimed to guide companies in developing truly sustainable business models and to understand the consequences of their sustainability actions. The design science research approach and Design Research Methodology guidelines were applied to develop a framework. The proposed initial framework contains elements from the prior literature of sustainable business models and corporate sustainability, complementing findings from empirical cases concerning 20 different sustainable business models. An initial framework was further tested and developed through 14 different sustainable business model cases. The study presents a revised framework that can help managers evaluate their business model choices and sustainable value creation dealing with stakeholder conflicts and complex tensions between sustainability goals. This study contributes to the corporate sustainability and sustainable business model literature by concretizing how the implementation of sustainable business models can lead to stakeholder conflicts and value destruction. From a theoretical perspective, the framework provides premises for more detailed sustainable business model design and creation of specific measures for the analysis of the system-level sustainability impact of sustainable business models.

Keywords: Corporate sustainability, Stakeholder conflict, Sustainable business model, Sustainable value creation, Value destruction

1. Introduction

Achieving sustainable development requires actions by all sectors of society, including businesses. The significant role of companies creating sustainable business and enhancing sustainability is raised in the corporate sustainability literature (e.g. Baumgartner and Ebner, 2010; Dyllick and Muff, 2016; Young and Tilley, 2006). Business model innovations, as integrative frameworks for strategy execution (Casadesus-Masanell and Ricart, 2010), are recognized as a key to the creation of sustainable business (Boons and Lüdeke-Freund, 2013; Carayannis et al., 2015). Being a reflection of corporate sustainability strategy, the sustainable business model (SBM) aims to integrate sustainable development goals into the business logic of the company and further day-to-day activities (Rauter et al., 2017). SBMs aim to create significant positive or significantly reduced negative impacts for the whole range of stakeholders—including society, the natural environment and the future generation—through changes in the way companies and their value networks create, deliver and capture value or change their value propositions (Bocken et al., 2014; 2019; Evans et al., 2017; Geissdoerfer et al., 2018; Schaltegger et al., 2016; Stubbs and Cocklin, 2008). SBMs are currently a hot topic among companies as well as in the academic literature. However, companies' commitments to sustainable value creation are not reflected in the state of our planet (Dyllick and Muff, 2016).

SBMs incorporate the creation of monetary and non-monetary value (i.e. sustainability benefits) for a broad range of stakeholders (Bocken et al., 2015; Yang et al., 2017a). However, what might be beneficial for one stakeholder might be harmful to another (Brennan and Tennant, 2018), leading to value destruction (Yang et al., 2017a) instead of

sustainable value creation. For example, although Airbnb boosts tourism in new areas and generates revenue for locals, it acts as a partial substitute for hotel nights, and rents go up in neighbourhoods where home sharing is popular (Frenken and Schor, 2017). Within the corporate sustainability literature, there is growing interest and an active discussion on tensions in sustainability, but the research on SBMs lacks this perspective. A majority of the research on SBM innovations has focused on designing sustainable value propositions (Baldassarre et al., 2017; Kristensen and Remmen 2019; Patala et al., 2016) and how business models create ecological and social benefits, but much less attention is paid to potential conflicts that business models may cause among multiple stakeholders (Biloslavo et al., 2018) and perceived value outcomes. Different managerial SBM and sustainable value creation tools and frameworks are presented in the recent literature, such as the Sustainable Value Exchange Matrix (Morioka et al., 2018), Value Mapping (Bocken et al., 2015) and the Sustainable Value Analysis Tool (Yang et al., 2017a); but these include a limited understanding of perceived value outcomes, negative consequences, stakeholders' conflicting interests and how to balance social, environmental and economic goals. SBM studies still lack a true systemic perspective (Bocken et al., 2019; Freudenreich et al., 2019), and a comprehensive analysis or framework for sustainable value creation does not exist. For example, Bocken et al. (2015) and Yang et al. (2017a) include a value uncaptured perspective in their tools, but they mainly focus on value proposition design and do not pay attention to cause and effect relationships or stakeholder conflicts, and they do not offer solutions on how to manage conflicting situations. Instead, Brennan and Tennant (2018) and Van Bommel (2018) aim to understand and resolve conflicts in sustainable value creation, but they do not offer managerial tools, frameworks or guidelines that are practical enough.

To address this gap, the aim of this study is to investigate value impacts of SBMs and to understand sustainable value creation and especially value destruction more deeply. This study proposes a framework that can help companies investigate the value impacts of SBMs, reveal potential stakeholder conflicts leading to value destruction, and understand the consequences of their sustainability actions. From a theoretical perspective, our aim is to increase knowledge on business model choice (cause) and sustainable value (effect) relationships. The framework increases transparency (Dyllick and Muff, 2016) and provides premises for more detailed SBM design and creation of specific measures for the analysis of the system-level sustainability impact of SBMs. The paper is structured as follows. We first present the key viewpoints from the SBM and corporate sustainability literature, which has set the foundation for our study, following the description of the used research approach and methods. We continue by presenting the framework for analysing business model choices towards sustainability from a value destruction perspective and discussing the results. We conclude with a discussion of the implications and avenues for future research.

2. Theoretical background

Corporate sustainability, also referred to as business sustainability (e.g. Dyllick and Muff, 2016; Ferro et al., 2019), considers how the macro-level concept of sustainable development can be applied to the business level, and it contains—like sustainable development—all three pillars: economic, ecological and social (Baugartner and Ebner, 2010; Dyllick and Hockerts, 2002). Corporate sustainability is about translating the general principles of sustainable development—which is the ultimate goal (Van Marrewijk, 2003)—into business practice (Azapagic, 2003; Dyllick and Hockerts, 2002). Integrating sustainability into the corporate sustainability strategy (Baugartner and Ebner, 2010) presumes that companies clearly understand the meaning and relevance of sustainable development (Rauter et al., 2017). Sustainability is formally defined as the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). However, sustainable development as defined by the Brundtland Commission is too general to be operationalized by executives (Rauter et al., 2017). In recent SBM and corporate sustainability studies, sustainable development is concretized through the sustainable development goals

(SDGs) of the UN 2030 agenda for sustainable development (Ferro et al., 2019; Morioka et al., 2018) and planetary boundaries (Whiteman et al., 2013). These systemically and scientifically defined goals ensure a company's journey towards strong sustainability (Williams and Millington, 2004) and justify the business.

A company's commitment to sustainable development is reflected in the mission statement, vision and strategy, and further translated into operational activities through SBM (Rauter et al., 2017). The business model intersects with the corporate strategy and business processes and operations (Al-Debei and Avison, 2010) and explains how a company 'does business' (Zott et al., 2011). The key elements of a successful business model are: value proposition, customer segments and relationships, activities and resources and processes, partners, distribution channels and cost structure and revenue streams (Bocken et al., 2015; Osterwalder and Pigneur, 2010). According to Yang et al. (2017b, p.1795), 'the concept of the business model is closely linked to the concept of value in most business model literature'. The essential parts of any business model are the value propositions, the value creation and the capture mechanisms employed (Bocken et al., 2015; Roome and Louche, 2016; Teece, 2010). These should be viewed as distinct processes (Lepak et al., 2007). Value proposition refers to a promise of value (i.e. benefits) to be delivered, such as usability, cost reduction and improved performance (Osterwalder and Pigneur, 2010). Conventionally, value proposition reflects a promise on how a company will serve its customers, and customer value propositions are defined as statements of the benefits of a particular product or service (Patala et al., 2016). Research on value creation consists of two main streams: *value creation processes* that consider the activities and resources involved, and *value outcomes* that consider how the value is perceived by the beneficiaries (Gummerus, 2013). Furthermore, value creation refers to potential or expected value or a company's attempt to increase value (Chesbrough et al., 2018), while value created refers to actual value outcomes. The value capture represents the value that the company generates for itself from its value proposition and value creation activities (Abdelkafi and Täuscher, 2016). This study focuses on sustainable value creation and companies' contributions to sustainable development mainly through value outcomes, i.e. value perceived by multiple stakeholders, as illustrated in Figure 1.

Sustainability calls for new business models as well as a redefinition of the concepts of value (Oskam et al., 2018; Roome & Louche, 2016). While the traditional business model aims mainly to create use value for customers, perceived as value for money, and capture exchange value expressed in profits for a company itself (Den Ouden, 2012), SBM aims to create different types of value for different stakeholders (Freudenreich et al., 2019) translated into multiple value concepts, such as increased prosperity and well-being at the society level (Den Ouden, 2012). SBMs promise sustainable value through sustainable value propositions, i.e. economic, environmental and social benefits to customers and other stakeholders (Patala et al., 2016). But in practice, sustainable value can be either created, i.e. perceived by multiple stakeholders and further captured by the company, or not. Created value means positive benefits delivered to and perceived by stakeholders, including wider value provided to the society and environment, such as improved safety or increased biodiversity. Captured value refers to positive benefits delivered to the company itself, such as decreased costs or increased profits (e.g. Engert et al., 2016; Schaltegger et al., 2012), but also non-monetary value, such as increased brand value (Saeidi et al., 2015) or social and environmental responsibility (Engert et al., 2016).

In addition to positive value impacts and increased benefits, sustainable value creation also requires the consideration of possible negative consequences (Tura et al., 2019), e.g. value destruction (Roome and Louche, 2016; Yang et al., 2017), negative side-effects (Bocken et al., 2019), trade-offs (Brennan and Tennant, 2018; Hahn et al., 2010), and value uncaptured (Yang et al., 2017b). Value destruction refers to the negative outcomes of the business, i.e. damage to the planet, people, and profits, such as rebound effects, greenhouse gas emissions, resource scarcity, biodiversity loss, unemployment, neglect of health and safety, unfair competition, inequality and job losses (Bocken et al., 2019; Yang

et al., 2017a; 2017b). Trade-offs in corporate sustainability describe situations where economic, environmental and social values cannot be achieved simultaneously (Hahn et al., 2010), and increased value in one dimension of sustainability can cause decreased value in another. For example, improving employees' working processes can lead to better work satisfaction and increased social value, but too much streamlining can lead to lay-offs and economic value destruction (Patala et al., 2016). One of the key challenges of sustainable value creation through business models is to deal with multiple stakeholders, because what might be beneficial for one stakeholder might be harmful to another (Brennan and Tennant, 2018), leading to value destruction instead of sustainable value created. We call these situations in sustainable value creation *stakeholder conflicts*. Creating sustainable value for different stakeholders, managing conflicting sustainability values (i.e. stakeholder conflicts and trying to avoid value destruction) cause understandable tensions, which represent the rule rather than the exception in corporate sustainability (Hahn et al., 2010; Van der Byl and Slawinski, 2015). According to Van Bommel (2018), the success of SBMs depends on the company's ability to consider, solve and manage tensions and conflicting sustainability values. In conclusion, understanding multifaceted perspectives of sustainable value creation is essential for targeting Sustainable Development Goals (SDGs) (United Nations, 2019).

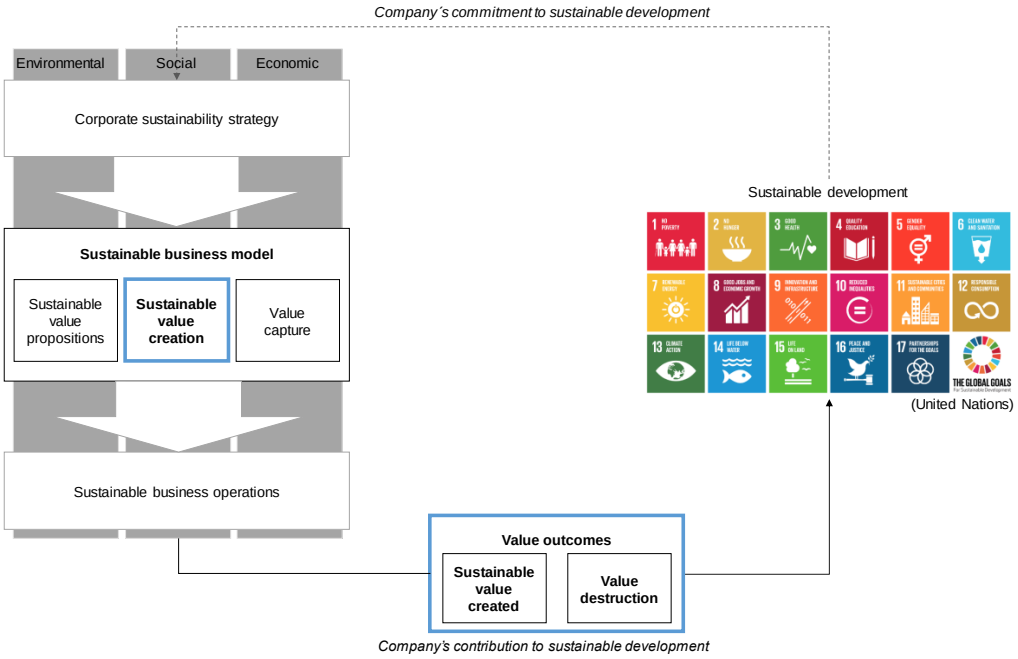

***Figure 1**. SBMs as vehicles to create sustainable value and contribute to SDGs.*

3. Methods

We adopted a design science research approach (Hevner, 2007; Peffers et al., 2007; Van Aken, 2004) because it fits the study's nature of introducing and testing an artefact, i.e. a model, tool, construct, or framework. Furthermore, we followed Design Research Methodology guidelines by Blessing and Chakrabarti (2009), encompassing the literature and practice-based iterative stages to develop a framework. Figure 2 presents the research process.

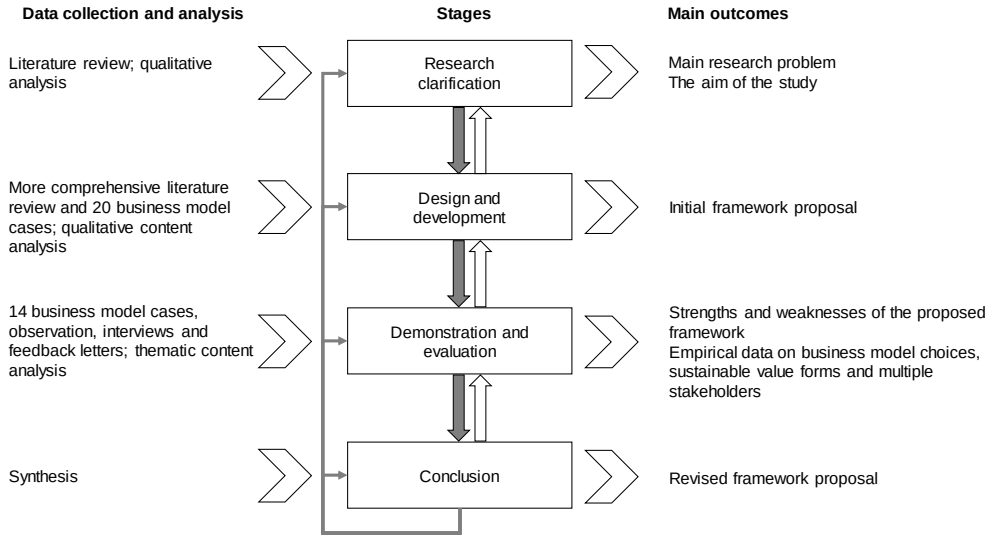

Figure 2. *Research process.*

The proposed initial framework contained elements from the prior literature of SBMs and corporate sustainability complementing findings from empirical cases concerning 20 different SBMs. These SBM examples represent sharing economy business models that are driven by economic, social and environmental benefits (Heinrichs, 2013), such as a more efficient and sustainable use of underutilized resources and the creation of deeper social connections between people (Acquier et al., 2017). But they have also been criticized, and it is not self-evident that the goals of sustainability are achieved (Malhotra and Van Alstyne, 2014). The cases covered different industries (accommodation, mobility, food and consumer goods), profit and mission-driven organizations and business models based on different monetary and nonmonetary transactions. The case companies are listed in Table 1. The empirical analysis was based on secondary data available on the companies' websites, previous research, reports, and other public documents, as well as publicly available information. Each case involved similar types of data collection. A value analysis was conducted by using a sustainable value framework generated from the previous literature. Finally, a case study narrative was written for each SBM, describing business model choices and sustainable value creation. The analysis was conducted by using the qualitative content analysis method (Eriksson and Kovalainen, 2016).

Table 1. *SBM cases*

Accommodation sector	Mobility sector	Food sector	Consumer goods
Airbnb	BlaBlaCar	EatWith	BookMooch
GuesttoGuest	Blue Bikes (before Hubway)	FoodCloud	Fashion Hire
HomeExchange.com	Car2go	Shareyourmeal	Freecycle
HomeAway	Turo (before RelayRides)	The Food Assembly	Peerby
Love Home Swap	Uber		Rent the Runway
	Zipcar		

An initial framework was further tested within the Case Course of Sustainable Business Models at LUT University. Thirty-four master students with different backgrounds attended framework testing. Others worked individually and others within groups consisting of two to four members. Altogether a framework was tested within 14 different cases covering different industries: food production, food services, welfare services, air traffic (passenger and freight traffic), alcohol sales (wines), restaurants, heavy industry, mining, power production and electric cars. One-third of the participants were mature students who worked with business model cases concerning the companies they work at. Written case descriptions and written data from observations, interviews and feedback letters were analysed through the thematic content analysis method (Myers, 2013), resulting in strengths and weaknesses of the proposed framework as well as categorizations of multiple stakeholders and sustainable value forms and a list of business model choices affecting sustainable value creation. Furthermore, the proposed framework was revised, taking into consideration the strengths and weaknesses as well as the complementary literature.

4. Results and Discussion

This section presents the findings from the literature, case studies and empirical testing, and explains the development of a framework. First, the overview and analysis of sustainable value creation is presented in Section 4.1. The initial framework proposal is presented in Section 4.2. Next, the main strengths and weaknesses of the initial version are discussed in Section 4.3. Finally, the revised version of the initially proposed framework is presented in Section 4.4.

4.1 Overview and analysis of sustainable value creation

In the management literature, the first explicit statements about sustainable value creation related to social and/or environmental sustainability are found in 2003, when Hart and Milstein developed a sustainable value framework that links the challenges of global sustainability to the creation of shareholder value by the firm. In recent studies, the focus moved from a purely instrumental view (Hart and Milstein, 2003) to a more integrative view on value (e.g. Den Ouden, 2012, Evans et al., 2017), and the creation of positive impacts (Dyllick & Muff, 2016; Bocken et al., 2019) and benefits (Patala et al., 2016; Evans et al., 2017; Sulkowski et al., 2018, Yang et al., 2017) or the minimizing of negative impacts (Bocken et al., 2019). Generally, sustainable value creation is understood through economic, environmental and social dimensions of sustainability—the so-called triple bottom line (e.g. Evans et al., 2017; Montabon et al., 2016; Oskam et al., 2018; Patala et al., 2016).

Different sustainable value forms that we identified from 20 SBM cases and the previous corporate sustainability and SBM literature (Azapagic, 2003; Bocken et al., 2019; Den Ouden, 2012; Evans et al., 2017; Future-Fit, 2019; Kristensen and Remmen, 2019; Nikolaou et al., 2019; Patala et al., 2016) are summarized in Table 2. These represent sustainable value forms companies aim to create. Value forms are divided into value creation processes and value outcomes as well as environmental, social and economic value forms. We also identified economic-environmental (e.g. resource efficiency) and economic-social (e.g. job creation) value forms. Therefore, we have used 'mainly' environmental, 'mainly' social and 'mainly' economic. Captured value by the company, such as increased revenue and profits or social and environmental responsibility and brand value, are not included in the table.

In sustainable value creation processes, environmental value creation is linked to the responsible use of resources, such as the use of renewables and increased resource efficiency, low emissions, pollution and waste prevention. Social value creation refers to decent working conditions, honest competition, and health and safety of employees and other stakeholders involved in value creation processes, etc. From an economic perspective, sustainable value creation processes are linked to increased resource and cost efficiency. Value outcomes (the main focus in this study) refer to the positive as well as negative economic, environmental and social impacts created by the company and its value

network and perceived by different stakeholders. From the environmental perspective, positive value outcomes (i.e. sustainability benefits) include a reduced need for physical goods and more sustainable consumption practices, better air, water and land quality, and increased biodiversity. Positive social value outcomes relate to increased health and safety, belonging, happiness, community development and job creation. From the economic perspective, sustainable value outcomes are linked to creating value for money for customers, stability and growth for the ecosystem and wealth for society. We found that sustainable value forms are general, hence they can perform either positively (as presented in Table 2) or negatively (i.e. value destruction). For example, decreased waste represents a positive value form and increased waste represents a negative value form.

Table 2. *Sustainable value creation potential.*

	Mainly environmental	Mainly social	Mainly economic
Value creation processes	Responsible use of resources (materials, water, energy): use of renewable resources, reduced use of finite resources, increased resource efficiency Low emissions & pollution prevention in value creation processes Reduced waste & waste prevention in value creation processes Biodiversity and climate change protection	Labour standards, practices and decent working conditions (e.g. wages, benefits, job satisfaction) Health and safety of employees and other stakeholders involved in value creation processes Respecting laws, regulations, rights and ethical principles (e.g. honest competition) Respecting employee, stakeholder, individual and human rights Equality and diversity (e.g. non-discrimination) Training and education of employees and other stakeholders involved in value creation processes Good relationships with other stakeholders involved in value creation processes (e.g. value co-creation)	Cost savings & increased cost efficiency in value creation processes Resource efficiency (incl. human resources) in value creation processes
Value outcomes	Increased resource efficiency (e.g. energy efficient products, product-service systems, sharing) Reduced need for physical goods, more sustainable consumption Lower emissions: Better air, water and land quality Reduced waste (e.g. solutions for waste prevention) Increased environmental well-being & ensured long-term well-being of planet (e.g. forests, climate change, biodiversity) Livability of the environment (e.g. the physical beauty of nature) Positive environmental value (e.g. afforestation)	Health and safety (e.g. product safety, increased public health) Social interaction (e.g. togetherness, belonging, reciprocity), social cohesion Emotional value (e.g. happiness) Equality and diversity Training and education of citizens Ensuring long-term social well-being and living conditions (e.g. belonging, happiness, health) Positive societal value (e.g. community development: secure livelihood, job creation, support of locals)	Value for money Cost savings & increased cost efficiency (e.g. cheaper products and services, energy efficient products) Increased revenue (e.g. increased revenue for business partners) Convenience, practicality, accessibility of products and services Stability and growth (e.g. growing ecosystem where companies support each other) Revenues (e.g. taxes) Wealth

Instead of focusing solely on customer value and shareholder value, SBMs consider sustainable value creation from the multi-stakeholder perspective (e.g. Bocken et al., 2015). Recent studies have adopted a stakeholder theory on business models and sustainable value creation (Freudenreich et al., 2019; Schaltegger et al., 2017; Sulkowski et al., 2018). From that perspective, SBMs can be defined as the results of activities that effectively contribute to solving a sustainability problem (e.g. reducing overfishing or increasing food security and decreasing hunger) in a way that creates economic as well as other forms of value to all stakeholders who are involved in the problem solution or are affected by the problem being solved (Schaltegger et al., 2017). Sustainable value should be created for multiple stakeholders, but also with them, referring to stakeholder interaction and value co-creation (Freudenreich et al., 2019; Oskam et al., 2018).

4.2 Initial framework proposal

Building on SBM case studies and the previous SBM and corporate sustainability literature, sustainable value creation analysis should include (1) environmental, social and economic perspectives on value, (2) value for different stakeholders and (3) both the value creation and value destruction perspectives. Furthermore, building on empirical SBM cases, we found that it is not self-evident that all sustainable value propositions are created in reality, and every single business model choice does matter. We observed value conflicts between stakeholders and complex indirect effects, such as trade-offs between sustainability dimensions and different time frames. Therefore, sustainable value creation analysis should include the relationship between business model choices and sustainable value created; and the sustainable value proposition should be analysed through multiple value forms instead of a general value proposition statement. This study proposes a managerial sustainable value creation analysis framework that considers all of these aspects. The initial framework proposal with an illustrative case example is presented in Figure 3. In the following, we present how to follow the framework through eight steps. We offer general guidelines, following the empirical examples concerning Airbnb's business model.

1. Sustainable value proposition: Write down a sustainable value proposition(s) that is the core of SBM. Sustainable value propositions are promises on the economic, environmental and social benefits that a company's offering delivers to multiple stakeholders, considering both short-term and long-term sustainability (Baldassarre et al., 2017; Patala et al., 2016). *Case example*: Airbnb is a sharing economy business model and online platform for listing and renting local and private living spaces for travellers. As a sharing economy business model, it aims to reduce the environmental load, increase social well-being and provide economic benefits (Acquier et al., 2017).

2. Stakeholders: Identify multiple stakeholders or stakeholder groups to whom sustainable value is aimed to provide for or who are affecting the value creation process. Stakeholders should be identified at different levels—such as user, organization, ecosystem and society (Den Ouden, 2012)—or customers, firm and shareholders, business network actors (including, e.g., suppliers and partners), society and the environment (Baldassarre et al., 2017; Bocken et al., 2013). *Case example*: Airbnb is a service enabler/platform operator that acts as an intermediary between two customer groups, the suppliers/service providers (i.e. hosts) and customers who demand underutilized goods and services (i.e. guests/travellers). Besides customers, new start-ups who offer value-added services (e.g. key deliveries, photographs and pricing tools) as well as the traditional hotel industry are the main stakeholders at the business environment level. At the society level, local residents/tenants and (more broadly) citizens are affected by Airbnb's business model, and public administration affects Airbnb.

3. Sustainable value form: Clarify defined sustainable value proposition by expressing it as specific environmental, social and economic value forms (see Table 2). *Case example*: For example, from the social value creation perspective, Airbnb aims to offer unique travel experiences and allow people to meet new people, create

friendships and social cohesion. From the environmental perspective, Airbnb aims to optimize the use of underutilized resources and enhance more sustainable consumption. From the economic perspective, Airbnb's business model proposes cost-savings, increased convenience and availability for travellers, and income and flexibility for hosts.

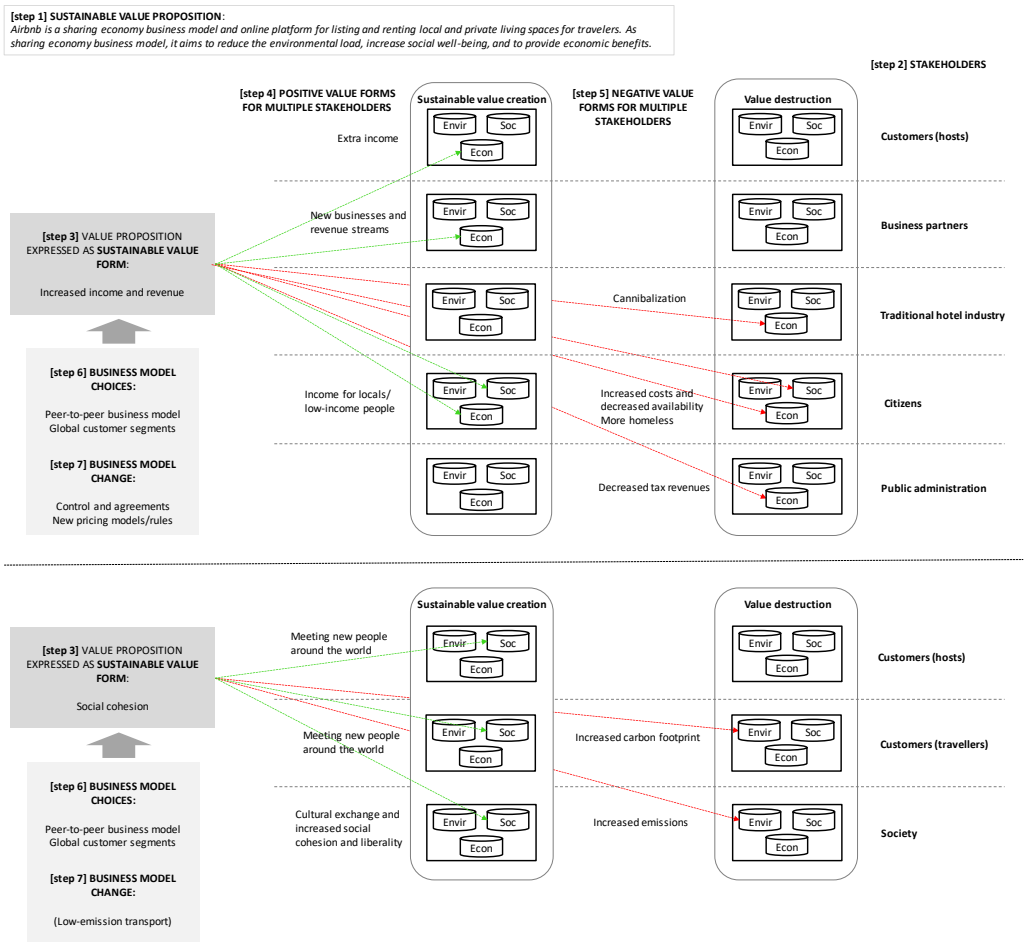

Figure 3. *Initial framework proposal: Case Airbnb as an example*.

4. Positive value forms for multiple stakeholders: Concretize previously defined value forms from the stakeholder perspective. In order to create sustainable value, it is important to consider the impacts on multiple stakeholders. That requires a deeper analysis on how each stakeholder perceives the multiple value forms defined in Step 3. *Case example*: For example, Airbnb's economic value proposition—increased income and revenue—is concretized as follows: Hosts are allowed to earn rental money/additional income, share the cost of ownership and reduce costs as well. At the business environment level, the entire accommodation-sharing industry is growing: Airbnb's business model has accelerated the rise of different start-ups offering value-added services. At the society level, Airbnb boosts tourism in underexplored areas and creates income for locals through accommodation-sharing and also restaurant, transport and other businesses. From the social perspective, Airbnb allows lower income

people to act as hosts and gain additional income, which helps them stay in their homes and pay for regular household expenses.

5. Negative value forms for multiple stakeholders: Identify value conflicts that (might) emerge when delivering positive value forms identified in Step 4. *Case example*: Aiming to create increased income and revenue, Airbnb is accused of taking guests from the traditional accommodation sector and having a negative impact on the revenue of local hotels. In popular cities, landlords are seeing more profit in short-term stays, which is leading to a decrease in the number of long-term renters and reasonably priced rental apartments. Airbnb customers are also accused of not paying taxes. Aiming to achieve social cohesion through meeting new people and more cultural exchanges, Airbnb's business model encourages people to travel the world over. This leads to an increase in air travel, which is one of the main sources of emissions polluting the air.

6. Business model: Describe how sustainable value is created or aims to create through business model choices. *Case example*: Airbnb's peer-to-peer business model allows individuals to earn income as well as to create social connections between peers. Having the global customer segment, Airbnb boosts tourism and enables cultural exchanges around the world.

7. Business model change: Identify how to avoid value conflicts or decrease value destruction through business model change. *Case example*: Airbnb could avoid negative economic impacts on society through tighter control, new agreements, home-sharing rules and pricing models. Furthermore, support from government policies assist this kind of development. The social value proposition is more complicated. If Airbnb aims to decrease air travel, it should focus on local customer segments, which decreases cultural exchange and limits economic opportunities. From the environmental perspective, lower-emission transport is needed, but this is outside of Airbnb's business model.

8. Summary: In conclusion, it is valuable to write down a short description or summary that represents the analysis and choices made. Repeat steps 3–8 as many times as new sustainable value forms are identified.

4.3 Strengths and weaknesses of the proposed initial framework

Based on observations and received feedback, Table 3 summarizes the main strengths and weaknesses perceived during the framework application. As strengths, the framework was broadly seen as a method for supporting SBM innovation and deepening understanding of sustainable value creation. The framework pieced together the big picture, helping to broaden perspectives and understand cause (business model choice) and effect (sustainable value form) relationships. From the sustainable value creation perspective, the use of the framework revealed the potential to realize sustainable value propositions, i.e. sustainable value created, but also negative impacts. The method used showed that the implementation of sustainable value propositions always includes risks. Participants saw that the framework simplifies evaluation and eases decision-making by making effects transparent and analysing value creation from multiple perspectives. Furthermore, the framework includes the description of business model choices that offered concrete solutions on how to manage value conflicts. The framework supported the SBM innovation process and complemented other managerial SBM tools (e.g. the sustainability SWOT and value mapping) that were used in the same cases. Overall, the framework was seen as multidimensional and illustrative, and the use of the framework intensified discussion and increased common understanding. Some weaknesses and improvement opportunities were also identified. Others felt that the approach was confusing at first sight because of multiple perspectives (multiple value forms and stakeholders). Furthermore, the offered template (see Figure 3) seemed to be one-sided; a chain of reasoning from value propositions to value creation or destruction did not come out very well. A few participants felt that the

instructions and illustrative examples limited their own thinking. The analysis was also seen as being too repetitive because every single value form was analysed in its own template.

Table 3. *Strengths and weaknesses of the proposed initial framework.*

	Strengths	Weaknesses
Managerial perspective	Supporting business model innovation for sustainability Deepening understanding on sustainable value creation Revealing risks Simplifying evaluation and easing decision-making Offering concrete solutions Supporting innovation process and complementing other managerial SBM tools Intensifying discussion and increasing common understanding Good approach (illustrative, multidimensional, specific) Good instructions with illustrative examples Good template (easy to use)	Confusing approach at first sight The instructions and illustrative examples might guide or limit one's own thinking too much A chain of reasoning from value propositions to value creation or destruction does not come out very well Because the value forms are the outcomes of several causes, the template seems to be one-sided Too much repetition
Theoretical perspective	Value-based approach Multidimensional approach (economic, social and environmental value forms; multiple stakeholders; value creation and destruction perspective; conflicts) New knowledge on stakeholder conflicts and value destruction New knowledge on cause (business model choice) and effect (sustainable value form) relationships	Does not consider scientific explanations for sustainable value Does not consider the time perspective Does not consider boundary setting Does not consider actions outside the company needed for business model change Does not consider conflict management Need for further development and testing

From a theoretical perspective, as strengths, the framework represents a systemic and value-based approach. It combines multiple perspectives (three dimensions of sustainability, multiple stakeholders and value creation and destruction) and analyses business model choices based on value forms created. Applying the framework creates new knowledge on stakeholder conflicts and value destruction as well as cause (business model choice) and effect (sustainable value form) relationships. As weaknesses, the framework lacks a scientific basis for sustainable value creation and theory for conflict management. If sustainability goals are based on benchmarks and not on scientific knowledge about sustainability (e.g. planetary boundaries and the carrying capacities of the planet), there is the risk that incremental and in absolute terms even ineffective improvements are seen as sustainable value creation and progress towards sustainability (Dyllick and Rost, 2017; Kurucz et al., 2017). The framework does not consider the time perspective or provide guidance on setting boundaries. According to boundary setting, if there are no frames or an understanding of the overall system where the business model operates, it will be difficult to assess the sustainable value created (Bocken et al., 2019). The framework still lacks a systemic perspective; it does not consider society-level actions needed for successful SBM innovation and sustainable value creation (Laukkanen and Patala, 2014).

4.4 Framework for analysing business model choices towards sustainability from the value destruction perspective

The proposed framework was revised, taking into consideration the strengths and weaknesses as well as the complementary literature. The revised framework proposal is presented in Figure 4. The revised framework follows the eight steps proposed within the initial framework, but the template looks different. The main changes from the initial to the revised version are discussed in the following. The revised framework represents a multidimensional and

multi-sided but also more systemic and dynamic approach (Lee et al., 2012) by applying a causal loop diagram instead of too-static template in the initial framework (Bautista et al., 2019). Systems thinking is a method to analyse the relationships between a system's parts, reveal direct and indirect effects, and understand the nonlinear behaviour of complex systems over time. Thus, the revised framework more clearly reveals the chain of reasoning from value propositions to value creation or destruction, and it allows a consideration of actions outside the company that are needed for business model change. Considering the time frame and distance from the company, which is linked to direct and indirect effects, the causal diagram is positioned on an x–y axis. The causal diagram visualizes how business model choices and sustainable value forms are interrelated. A green link indicates a positive value stream, and a red link indicates a negative value stream. Blue rectangles refer to economic value creation, orange to social value creation and green to environmental value creation. Purple boxes and arrows are business model changes proposed to prevent negative impacts. Grey boxes and arrows are the actions outside the company that are needed for business model change.

According to boundary setting and the systemic perspective, the revised framework consists of different levels: company, customers, business network/environment (e.g. supply chain partners, other business partners, investors, research and development, competitors), society (e.g. citizens, government, authorities, political organizations, media) and the environment as an independent stakeholder (e.g., Bocken et al., 2015; Dyllick and Muff, 2016; Evans et al., 2017; Schaltegger et al., 2016) covering socio-technical and socio-ecological systems. The revised framework highlights the company's role of being part of the larger macro-level system and affecting systemic change towards sustainable development (Sulkowski et al., 2018). Furthermore, sustainable value creation is linked to SDGs, which are aligned with sustainability principles (Broman and Robért, 2017). SDGs represent the ultimate sustainability goals that justify sustainable value creation.

The proposed framework can be used (1) to evaluate defined sustainable value propositions in a business model innovation process or (2) to assess sustainability impacts, i.e. sustainable value created in practice. In the first case, the framework is used before a new SBM is implemented, while the framework works as a guiding tool in decision-making. It helps to plan, identify and make business model choices but also to make changes before defined value propositions. When the negative value impacts are identified before the business model is implemented, they are not necessarily totally eliminated, but at least divergent business model options are considered (Van Bommel, 2018), or negative value impacts are even translated into new value opportunities (Yang et al., 2017). In the second case, the framework works as a qualitative assessment tool in evaluating the business model's sustainability.

Companies can take different approaches to manage tensions and stakeholder conflicts (Van der Byl and Slawinski, 2015). Companies could try to avoid tensions by focusing on implementing those sustainable value propositions, where alignment between value outcomes exist aiming to find a win-win solution. Alternatively, companies could follow a trade-off strategy and implement value propositions, although that decision might have negative impacts. Applying an integrative approach, companies aim to create multiple value forms holistically without favouring any sustainability dimension or stakeholder group. An integrative approach sounds a pathway towards sustainability, but in practice, achieving such a balance is impossible. Thinking paradoxically, companies accept conflicting values and try to find innovative solutions to manage them. For example, they can consider the negative value forms as potential value creation opportunities (Yang et al., 2017a).

Aibnb's value proposition: *Airbnb is a sharing economy business model and online platform for listing and renting local and private living spaces for travellers. As sharing economy business model, it aims to reduce the environmental load, increase social well-being, and to provide economic benefits.*

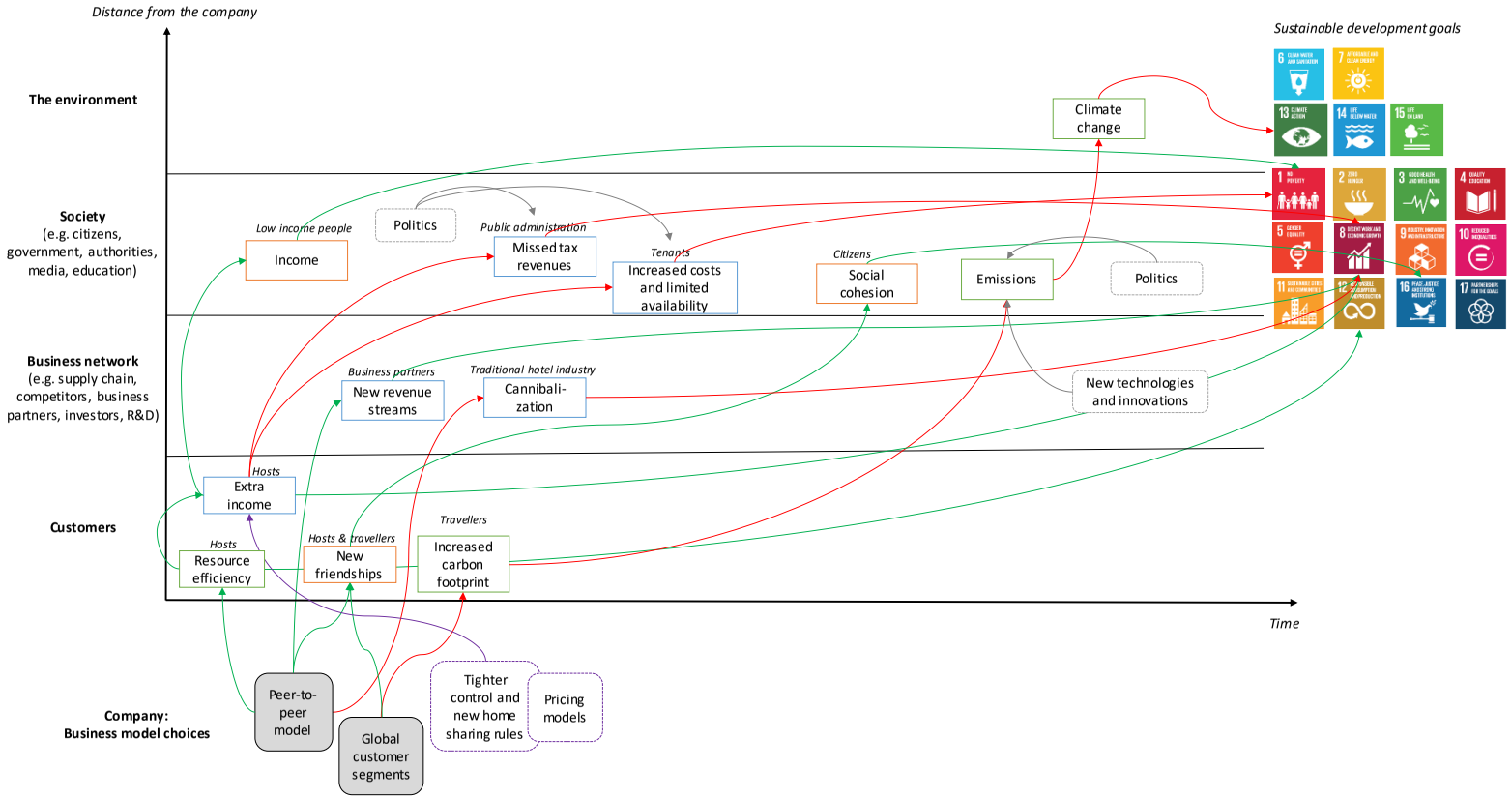

Figure 4. *Revised framework proposal.*

5. Conclusions

This study proposes a multidimensional, systemic and dynamic approach to the assessment of SBMs and sustainable value creation. We hope that this study reveals value conflicts leading to value destruction instead of sustainable value created and provides a basis for guiding companies to implement sustainable value propositions and create sustainable value for multiple stakeholders. In order to achieve this, we made the following contributions. From the managerial perspective, we presented a framework for analysing business model choices towards sustainability from the value destruction perspective. A framework can help managers evaluate their sustainable value propositions and value creation as well as business model choices, and it can be used either as a guiding tool in the SBM innovation process or as a qualitative assessment tool in evaluating realized sustainability impacts. From the theoretical perspective, this study broadens the value destruction perspective, which is the least explored element in the SBM and sustainable value creation literature. The approach we used increased knowledge on the multifaceted nature of sustainable value creation through an increased understanding of the business model choice (cause) and sustainable value form (effect) relationships and stakeholder conflicts and value destruction. The proposed framework provides premises for more detailed SBM design and creation of specific guidelines for the implementation of sustainable value propositions and measures for the analysis of the system-level sustainability impact of SBMs. The framework testing in this study provided broad data on multiple negative and positive value forms, stakeholders, value conflicts and effects of different business model choices. This offers a basis for further analyses and theory development. Naturally, this research also has several limitations, which at the same time provide more avenues for future research. The framework needs further development and testing. The current version considers both the positive and negative links, but not the power of the impact. The focus of the framework is on estimating the sustainable value creation impact at a high level, not on specific measures that are needed when assessing absolute sustainability (Chandrakumar and McLaren, 2018).

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Analyzing Business Model Choices and Sustainable Value Capturing: A Multiple Case Study of Sharing Economy Business Models

Minttu Laukkanen[1*], Janne Huiskonen[1]

[1]Lappeenranta University of Technology, P.O.Box 20, FI-53851 Lappeenranta, Finland. E-mail: minttu.laukkanen@lut.fi.
[2]Lappeenranta University of Technology, P.O.Box 20, FI-53851 Lappeenranta, Finland. E-mail: janne.huiskonen@lut.fi.
*Corresponding author

***Abstract*—**This study investigates sharing economy business models as examples of sustainable business models. The aim is to contribute to the limited literature on sharing economy in connection with sustainable business models by explaining the value capturing of sharing economy business models. Specifically, the study answers the following question: How do business model choices affect captured sustainable value?

A multiple case study approach is applied in the study. Twenty different successful sharing economy business models focusing on consumer business and covering four main areas, accommodation, mobility, food, and consumer goods, have been selected for analysis. Secondary data available on companies' websites, previous research, reports, and other public documents are used. All twenty cases are analyzed through the sharing economy business model framework and sustainable value analysis framework by using qualitative data analysis.

The study presents the general value attributes of sharing economy business models and their specifications, i.e. sustainable value propositions for different stakeholders, and explains the sustainability impacts of different sharing economy business models through captured and uncaptured value. In conclusion, the study presents how business model choices affect sustainable value capturing, through eight identified business model attributes. This paper contributes to the research on sustainable business models and sharing economy by examining how business model choices affect captured sustainable value. The study highlights the importance of careful analyses of business model and sustainability impacts, including the triple bottom line, multiple stakeholders and value captured and uncaptured perspectives, as well as sustainability trade-offs. It is not self-evident that sharing economy business models advance sustainability, and business model choices do matter.

***Keywords*—**Sharing economy, sustainable business model innovation, sustainable value, value capturing.

I INTRODUCTION

NEW sharing economy business models (SEBM) have emerged in recent years. There are numerous ways to share different kinds of tangible and intangible assets, such as space, skills, material, and money. This research concentrates on SEBMs as examples of sustainable business models (SBM). SEBMs are driven by economic, social and environmental benefits [1], such as more efficient and sustainable use of underutilized resources and the creation of deeper social connections between people, but SEBMs have also been criticized [2], and it is not self-evident that the goals of sustainability are achieved. For example, broader ecological benefits will not be achieved if people choose car-sharing over walking, bicycling or public transport, or if they do not give up individual car ownership and reduce driving.

To date, the research on the sharing economy has lagged behind in public discourse and

practice, and a majority of the research has been conceptual by nature or based on singular case studies [3]. Car-sharing business models [4], [5] have received most attention, otherwise a limited number of studies have focused on sharing economy in connection with SBMs. The sharing economy can be seen as a potential new pathway to sustainability [1], but the economic, social and environmental effects of SEBMs are still largely unknown [6]. There is notable call for empirical analysis of the sustainability impacts of SEBMs [1], [6], [7] and developing design options in order to exploit the sustainability potential of the sharing economy [1]. In the context of sustainability research, there is need for more systematic comparison of different sharing practices [8]. Research on SEBMs has to go beyond the business model itself [9], and consider the impact that the sharing economy has on the wide range of stakeholders involved [10]. So far, most studies have focused on identifying the motivation of users to participate in the sharing economy [10].

This study contributes to these calls by reviewing SEBM literature and analyzing various SEBMs in relation to sustainability. SEBMs are applied in a variety of industries and sectors [11], but this study focuses on consumer business and accommodation, mobility, food, and goods sharing. The research has two main objectives. First, it contributes to the SBM literature by focusing on the sustainable value captured by the stakeholders, which is the least explored element of SBM compared to the sustainable value proposition and value creation and delivery system [12]. Second, the research contributes to the limited literature on the sharing economy in connection with SBMs by explaining the value capturing of SEBMs. Specifically, the study answers the following question: *How do business model choices affect captured sustainable value*?

The paper is structured as follows. The second section reviews the literature and presents the theoretical background on SBMs and provides an overview of SBMs in the context of the sharing economy. The third section outlines the data and methods, and the fourth section discusses the findings. The article concludes with a discussion on the implications and avenues for future research.

II LITERATURE REVIEW

A. Sustainable Business Model Innovation

Business model innovation is widely acknowledged as a source of innovation [13] and as a key source of competitive advantage [14], [15]. It is also recognized as the key to the creation of sustainable business [16], [17] and to enhancing the transition towards a circular economy [18]. A business model describes the rationale of how an organization creates, delivers and captures value [19], and emphasizes a holistic approach to explaining how companies "do business" [20]. The business model describes not just what a business does but also how and to whom it does it [21].

Business models for sustainability, i.e. sustainable business models, create significant positive or significantly reduced negative impacts for the environment and/or society through changes in the way organizations and their value networks create, deliver and capture value or change their value propositions [22]. According to Schaltegger et al. [23], the objective of sustainable business modeling is to identify opportunities that allow firms to capture economic value whilst generating environmental and social value, thereby establishing a business case for sustainability. SBM needs to create value to the whole range of stakeholders and the natural environment, beyond

customers and shareholders [23]. Morioka et al. [12] present the concept of cascaded sustainable value, which illustrates the "second layer" of value captured. Cascaded value is the value deployed by the focal organization's stakeholders to their own stakeholders.

According to Yang et al. [24], "the concept of the business model is closely linked to the concept of value in most business model literature" (p. 1795). A widely accepted framework for business models consists of three blocks, namely value proposition, value creation and delivery and value capture, as presented in Fig. 1. From the sustainability perspective, it is a question of more than just the delivery of customer value or the realization of economic value [25].

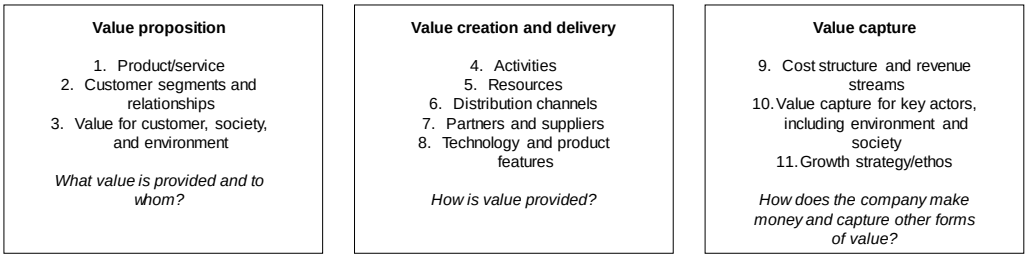

Fig. 1 Conceptual sustainable business model framework [26]

Evans et al. [27] illustrate a holistic view of sustainable value integrating economic, environmental and social value forms (Fig. 2). Den Ouden [28] offers a comprehensive value framework that considers psychological value besides economic, environmental and social value forms, and explores value for different stakeholders at user, organization, business ecosystem, and society level. The multi-stakeholder perspective on value is central to SBM [26]. The purpose of SBM is to create value for a larger group of stakeholders, including the natural environment and humans with whom we will likely never engage by solving a sustainability problem [29].

According to Den Ouden [28], the economic value for the users expected to use the system, product or service is "value for money," which reflects the usefulness of a product/service and the value or price of a product/service compared to the value or price of another product/service. The economic value that companies strive for is "profit", and for an ecosystem it is financial "stability" and resilience. The economic value for the society is summarized as "wealth". The ecological value concepts are an individual's "ecological footprint," "eco-effectiveness" at the organizational level, "sustainability" at the ecosystem level and "livability of the environment" at the societal level. The livability of the environment is related to biodiversity as well as the physical beauty of nature. The sociological value for the user translates into "belonging," which is an important parameter in determining people's happiness. At the organizational level, sociological value is summarized as "social responsibility," which represents the impact of an organization's behavior on the society. Value at the ecosystem level from the sociological perspective translates into reciprocity, reflecting a system which all parties contribute to and benefit from. At the level of the society, the ultimate value is the greatest happiness of the greatest number of people and "meaningful life". The psychological value concept for a user is "happiness", representing an individual's psychological well-being. At the organizational level, psychological value is "core values". These are the purpose and objectives of an organization encapsulated in their mission statement. At the ecosystem level, "shared drivers" represent a shared mission, and the overall value for the society is the psychological "well-being" of people.

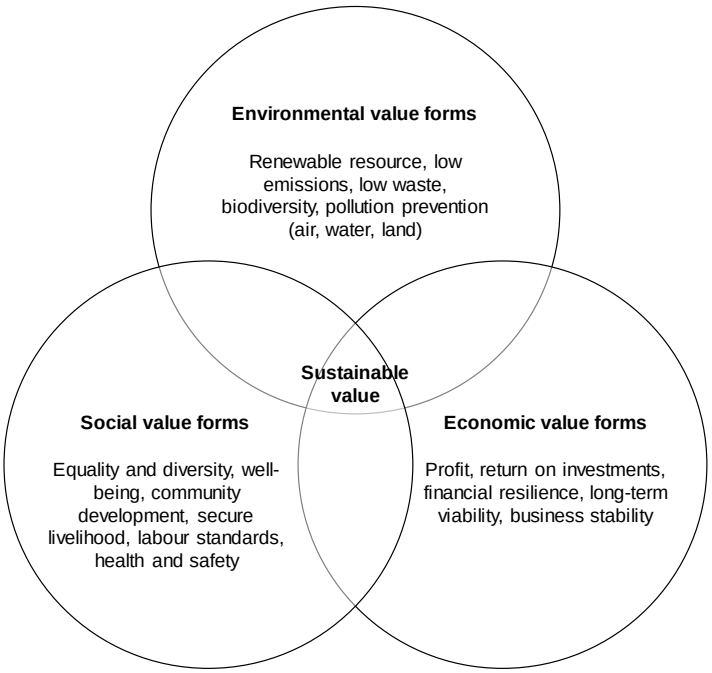

Fig. 2 Different forms of sustainable value [27]

SBMs propose sustainable value, but in practice, value can be either captured or uncaptured [22], [24], [25]. Captured value means positive benefits delivered to the company and its stakeholders, including wider value provided to the society and environment besides monetary value [24], such as improved energy efficiency or safety. Yang et al. [24], [25] present four forms of value uncaptured: value destroyed, value missed, value surplus, and value absence. Value destroyed includes the negative outcomes of the business, and it can be seen as damage to the planet, people, and profits, such as greenhouse gas emissions, resource scarcity, biodiversity loss, unemployment, neglect of health and safety, unfair competition, and inequality. Value missed represents situations where stakeholders fail to capitalize on existing assets, capabilities and resources, or fail to receive benefits they seek from the network, possibly due to poorly designed business models. Value surplus is value that exists, but is not required, such as wasted heat, over-production, or unnecessary, repeated work. Value absence refers to things or activities that are required, but do not exist, for example the need for recycling services or a temporary lack of labor.

In conclusion, building on previous literature, sustainable value analysis should include (1) different forms of value, (2) value for different stakeholders, (3) the value captured and uncaptured perspective, and (4) cascaded sustainable value.

B. Sharing Economy

The terms “collaborative consumption” [30], “sharing economy” [1], “sharing” [31], “access-based consumption” [32], “anti-consumption” [33], “gig economy” [34], “platform economy” [35], and “on-demand economy” [36] are often used interchangeably. The existence of numerous

overlapping or competing terms has led to confusion among managers and academics. The field lacks a unified definition of the sharing economy [3]. The challenges of defining the sharing economy are that the term "sharing" can have various meanings [31], [37], and the sharing economy seems to be a novel and emerging theme for research.

The sharing economy is seen as an umbrella construct [3], [10], [37], [38] covering collaborative consumption, product service systems (PSS) and redistribution markets as well, but also a model limited to collaborative customer-to-customer (C2C) or peer-to-peer (P2P) practices [6], [39]. Table I summarizes the narrow and broad definitions of the sharing economy, and in the following, we explain how these differ from each other.

The importance of unlocking the value of unused or underutilized assets is common to most definitions of the sharing economy. Some definitions limit the sharing economy to P2P interactions and temporary access. For example, Frenken and Schor [6] define the sharing economy as: "consumers granting each other temporary access to under-utilized physical assets ("idle capacity"), possibly for money" (pp. 4-5). Renting goods from a company rather than from another consumer is excluded and called the product-service economy. Selling second-hand goods or giving away goods to each other do not fall under the concept of the sharing economy either, as consumers grant each other permanent access rather than temporary access to their goods. Further, the focus is on the sharing of physical goods, and when dealing with P2P service delivery (e.g., a ride), the term on-demand or gig economy is used.

Parente et al. [39] and Mair and Reischauer [40] highlight the importance of infrastructure in the sharing economy by viewing interactive, internet-based platforms as central. Relating to infrastructure, Kumar et al. [41] define the sharing economy as consisting of a service enabler (e.g., Uber, Airbnb), which acts as an intermediary between the service providers (suppliers of a good or service, e.g., driver, host) and customers who demand underutilized goods and services (e.g., rider, guest). Hence, they exclude for example traditional carpooling, as it lacks an intermediary. They also prioritize economic incentives, and exclude companies like Couchsurfing or Freecycle that do not involve any monetary compensation. On the other hand, Belk [31] defines Couchsurfing as a business model based on true sharing, whereas collaborative consumption (including Uber and Airbnb) is seen as pseudo-sharing.

Instead of adding new definitions or focusing on a clear-cut definition which classifies activities as either sharing or not sharing economy, some scholars have presented broader sharing economy frameworks [10] or typologies of sharing economy activities [8] that allow scholars and practitioners to position their research and practice. Heinrichs [1] follows Botsman and Rogers [30] and positions PSSs, redistribution markets, and collaborative consumption under sharing economy, Acquier et al. [10] position the sharing economy as resting on access economy, platform economy and community-based economy, and Habibi et al. [37] map sharing economy practices from pure sharing to pure exchange, and apply the sharing-exchange continuum. PSSs [42], [43] enable multiple products owned by a company or a private person to be shared or rented. Instead of buying and owning goods, consumers receive access to goods.

Bardhi and Eckhardt [32] define "access-based consumption as transactions that may be market-mediated and in which no transfer of ownership takes place" (p. 81). Examples of PSSs vary from shared mobility [4] to fashion libraries and use-oriented clothing [44], [45]. Redistribution practices (reselling, gifting) encourage reusing and reselling by enabling the redistribution of used or pre-owned goods from where they are not needed to somewhere where they are. Examples vary from on-sale models where a company purchases unwanted goods direct from customers and then re-sells them for a higher value (e.g. eBay) to grassroot innovations [46]

and free reuse groups, such as Freecycle. Collaborative lifestyles refer to sharing and exchanging less-tangible assets such as time, space, skills, and money [30]. Collaborative lifestyles are enabled by Couchsurfing, Skillshare and TaskRabbit, for example. The relevance for sustainability seems to appear especially at the intersection of collaborative peer-to-peer practices, access-based PSSs, redistribution markets, and different relationships and actions between peers but also between firms or other civil society actors and customers [1]. We have adopted this broader view of the sharing economy, and discuss the sharing economy frameworks or typologies closely in the next chapter.

TABLE I
EXAMPLES OF NARROW AND BROAD DEFINITIONS OF SHARING ECONOMY

Authors	Definition	Included	Excluded
Frenken & Schor [6]	"consumers granting each other temporary access to under-utilized physical assets ("idle capacity"), possibly for money" (pp. 4-5)	Unused or underutilized assets P2P interaction Temporary access Sharing of physical goods	Reselling Gifting B2C interaction P2P service delivery
Parente et al. [39]	"focusing only on internet-based, social interactive platforms targeting rent appropriation from transactions involving temporary access to underutilized assets" (p. 53)	Unused or underutilized assets P2P interactions Network effects for growth Temporary access Sharing of goods and services Internet-based platform	B2C interaction (e.g. Zipcar) Crowdfunding platforms
Kumar et al. [41]	"the monetization of underutilized assets that are owned by service providers (firms or individuals) through short-term rental" (p. 148)	Unused or underutilized assets P2P interaction Temporary access Economic incentives Triadic business model	Collaborative lifestyles, nonmonetary transactions (e.g. Couchsurfing, Freecycle) Traditional carpooling (lack of an intermediary) Selling second-hand goods in pure market places (e.g. eBay)
Mair & Reischauer [40]	"as a web of markets in which individuals use various forms of compensation to transact the redistribution of and access to resources, mediated by a digital platform operated by an organization" (p. 12)	Unused or underutilized assets P2P interaction Temporary access and redistribution Sharing of material and nonmaterial resources Digital platform Various forms of compensation (e.g. traditional payment, bartering, trading, gift giving)	B2C interaction
Muñoz & Cohen [3]	"a socioeconomic system enabling an intermediated set of exchanges of goods and services between individuals and organizations which aim to increase efficiency and optimization of under-utilized resources in society" (p. 21)	Unused or underutilized assets P2P, B2B and B2C interaction Sharing of goods and services For-profit and non-profit transactions Reselling, gifting	
Hamari et al. [38]	"an umbrella concept that encompasses several ICT developments and technologies, among others CC, which endorses sharing the consumption of goods and services through online platforms" (pp. 2047-2048)	Sharing of goods and services Monetary & non-monetary transactions Renting, swapping, trading, sharing, donating Online platform	
Heinrichs [1]	"an umbrella concept and encompassing vision, helping to understand and guide new inventions and the institutionalization of new economic practices, roles and interactions of societal actors" (p. 229)	P2P, B2B and B2C interaction & the activities of civil society actors and government entities Product service systems: renting, leasing Redistribution markets: reselling Collaborative lifestyle	

Acquier et al. [10]	"an umbrella construct and an essentially contested concept" (p. 1)	Access economy: unused or underutilized assets (material resources or skills), P2P, B2B and B2C interaction, temporary access, for profit, non-profit, public-private partnership or cooperative model Platform economy: P2P interaction, intermediary, digital platform, sharing of goods and services, market-based and non-monetary transactions (e.g. gift giving, bartering or swaps), 'pseudo-sharing' Community-based economy: non-contractual, non-hierarchical or non-monetized forms of interaction (e.g. Peerby), 'true sharing'	
Plewnia et al. [8]	"the broadest definition of the sharing economy could include activities or platforms which facilitate the sharing of material, products, product services, space, money, workforce, knowledge, or information based on for-profit or non-profit transactions in a variety of different market structures (B2C, C2C, C2B, B2B, and G2C). Consequently, the framework includes social (non-profit), economic (for-profit), and communicational (sharing knowledge and skills or sharing information and data) interpretations of the term "sharing."" (p. 576)	Sharing of material, products, product service systems, space, workforce, knowledge and education, and information and data For-profit and non-profit transactionsA variety of different market structures (P2P, B2C, C2B, B2B, and G2C)	

C. Sharing Economy Business Models

According to Kumar et al. [41] and Piscicelli et al. [47], the business model of the sharing economy is a triadic business model, which consists of a service enabler/platform operator, which acts as an intermediary between two customer groups, the suppliers of a good or service (service provider), and customers who demand underutilized goods and services. The matchmaking can be either demand-driven, supply-driven, or a combination of both [48]. This follows the narrow view of the sharing economy defined above and excludes for example B2C access-based business models, such as Zipcar.

Acquier et al. [10] position the sharing economy as resting on three foundational cores: access, platform, and community-based economy, and propose four types of SEBMs: access platforms, community-based platforms, community-based access, and sharing economy ideal, which is positioned at the intersection of all three cores. Based on the importance of the (digital) platform, the use of underutilized resources, the level of P2P interaction, collaborative governance and mission-driven drivers, alternative funding, and reliance on technology, Muñoz and Cohen [3] present five ideal types of SEBMs: crowd-based tech (e.g. Uber), collaborative consumption (e.g. BlaBlaCar), business-to-crowd (e.g. Rent the Runway), space-based, low-tech sharing (e.g. shared kitchen), and sharing outlier business model (e.g. Kiva). The crowd-based tech business model relies strongly on technology and P2P interaction. Both collaborative consumption and business-to-crowd business models rely on underutilized resources, but they differ at the level of

P2P interaction. When the sharing economy is defined narrowly, a crowd-based tech business model focusing on fast-scale and mostly economic incentives, and business-to-crowd business models without P2P interaction are seen just as forms of traditional enterprises. The spaced-based, low-tech sharing business model enables sharing by facilitating access to physical spaces, such as kitchens or workspaces. The sharing outlier business model is a combination of collaborative governance, social impact predominance and alternative funding (alongside peer interaction and technology), which is rare in the sharing economy. As the field lacks a unified definition of the sharing economy, the broad frameworks help researchers to position their SEBM studies from the theoretical and empirical point of view [10].

Value proposition. Companies have to understand what jobs customers want to get done, and design their value proposition around those jobs [49]. For example, when people want to get easily from points A to B without administrative tasks, such as handling insurance or the need for extra space for keep a vehicle, car sharing systems are suitable for meeting these needs. In general, SEBMs connect people and increase social interaction, as well as offer cost effectiveness and practical utility to their users due to access to underutilized assets [50], [51]. Customers value practicality, cost and time savings and extra incomes, as well as environmental and social benefits; new friends, belonging and "doing the right thing" [30], [52]. Perceived sustainability influences the attitudes towards SEBMs positively, but economic benefits are found to be a stronger motivator for the intention to participate in the sharing economy [38]. SEBMs are mostly adopted by Generation Y, which is knowledgeable in digital technologies, web platforms, mobile apps, and social networks [41], [51]. The majority of SEBMs focus on operating in cities [51], where a critical mass of users [30] can be reached. Rural areas have lower population densities and, on average, an older population and less of the infrastructure needed to facilitate the sharing of services [51]. The customers are typically socially concerned, price sensitive, knowledgeable in technology, and environmentally concerned [51]. Binninger et al. [53] categorize the profiles of consumers into six groups on the basis of their motives: (1) smart shoppers, who control their budget and contribute to the sharing economy for financial reasons; (2) altruistic humanists, who look for social contacts, getting to know others, and social cohesion; (3) pleasure seekers, who look for new, creative and interactive forms of consumption; (4) alternative consumers, who oppose the dominant market system and demand sustainability; (5) postmodernists, who look for emotional value as much as utilitarian value and engage in the sharing economy if social connections are guaranteed; and (6) bourgeois bohemians, who actively look for new innovative products and services and act as early adopters.

Value creation and delivery. Compared to the traditional business model, the sharing economy requires companies to reconsider their key resources and processes [49]. Value propositions are mainly delivered to and communicated with customers via virtual channels. In some cases, like fashion libraries [44], the main channels are physical stores. The required amount of resources and technology for companies to set up matchmaking platforms is relatively low, limited to software developers, programmers and marketers [48]. Some B2C business models are more dependent on physical resources, for example Zipcar has its own fleet. In P2P and B2B platforms, the members are both upstream and downstream partners acting as suppliers as well as customers. There are often synergies between different types of SEBMs, hence companies have interests in partnering with each other [51]. Different business models can be connected to create holistic sharing concepts, for example, linking various travel-related sharing services. Partnering can also help to find new users who are already familiar with SEBMs. Companies oriented towards the sharing economy also have interests in partnering with traditional companies. Co-operation with

larger and well-known companies helps to create trust, and offers benefits from existing structures, such as established relations with suppliers, retailers and other partners, whereas traditional companies can benefit from agility in the implementation of solutions, as well as adaptability towards new trends and customer expectations. [51] In order to take advantage of the full potential of the sharing economy, a holistic approach is needed [4]. The targets of creating sharing cities and achieving positive sustainability impacts can only be attained when multiple actors from the private and public sector work together.

Value capture. Starting a business in the sharing economy can be done at a relatively low cost, particularly in the case of P2P platform-based models, but scaling up requires more investment [51]. The main costs of running a business in the sharing economy concern the hosting and maintaining of the platform and the development of new features. At the same time, this opens up new ways of generating revenue. Acting as an intermediary between two customer groups (e.g. hosts and guests) creates value by charging fees that depend on the value transferred [41], [49]. Besides the opportunity for different revenue streams and reduction of costs, SEBMs hold potential for higher profit margins [49]. A global survey by Wagner et al. [51] indicates that sharing economy initiatives may face difficulties in generating reliable revenue streams. In order to reach a critical mass of members, relatively cheap products or services are offered in the start-up stage. Later, it will be challenging to generate revenue streams from price-conscious customers. According to Enders et al. [54], success depends on the number of users on a platform, i.e. a critical mass of service providers and customers, the users' willingness to pay for a specific service, and the level of consumer trust. The importance of each driver varies for each revenue model, for example, if the users' willingness to pay is low, but there is a high level of traffic on the platform, advertising models will be implemented. By contrast, models based on subscription fees require high willingness to pay. For transaction models, both a critical mass of users and moderate willingness to pay have to be assured, but the key revenue driver is consumer trust. This is especially apparent when transactions are executed online between strangers without any physical interaction, and everything is based on trust.

Besides economic benefits, SEBMs are assumed to capture environmental and social value as well. SEBMs aim at maximizing utilization and avoiding overconsumption, and when consumers rent, share, swap, or lend their idle goods, fewer resources go into making products. SEBMs play an important role in changing consumer habits as well [55], [56]. For example, the environmental benefits derived from car-sharing are not limited to the optimization of vehicle utility. Additional benefits are that optimal number of miles may be traveled by using a shared car, and sharing a ride may lead to new friendships. SEBMs are driven by economic, ecological and social concerns. However, it is by no means self-evident that these goals can be achieved [7]. Whereas many companies claim to create social or environmental benefits, only a few have measured the impacts they create in a systematic or quantifiable way [51]. According to Leismann et al. [55], the general statement that "use rather than own schemes are resource-efficient" is not applicable. These systems may be associated with negative ecological side-effects, for example due to the transportation or packaging material required. Redistribution is positive from the environmental point of view when the "provider" no longer needs the product and does not replace it with another purchase, and the "recipient" does not need to buy a new product, i.e. the acquisition of a used product replaces a purchase, and the environmental impact of the redistributed product is not linked to its usage [56]. In reality, redistribution does not always meet these conditions, for example, people who get gifts do not necessarily consider these goods as replacements for new purchases, but as additional items. The sharing economy also lacks regulation in contrast to

conventional businesses [57].

By reviewing previous literature, Frenken and Schor [6] have assessed sharing economy platforms in terms of economic, social and environmental impacts. They found that the direct economic effects of the sharing economy are indisputably positive; the rise in income or consumer welfare can be understood as a direct consequence of lower transaction costs, but the full economic effects are far more complex. The rise of SEBMs will have indirect effects on traditional business models, for example, Airbnb acts as a partial substitute for hotel nights, or rents go up in neighborhoods where home sharing is popular. The environmental effects are complex as well. SEBMs are advertised as green and less resource-intensive, but there is little empirical evidence on that, or at least the systemic perspective including second round impacts is lacking. For example, if the resale of used items creates earnings that are then used to buy new goods, the original sale may not reduce environmental impacts. Regarding the social impacts, the benefits of meeting new people and making friends are central in many SEBMs' value propositions, but it seems that as more people participate in the sharing platforms for economic reasons, social interaction will decline.

We consider the sharing economy as an umbrella concept, and following Acquier et al. [10], we do not present new definitions. We position the sharing economy as focusing on unlocking the value of unused or underutilized resources. Further, building on previous literature we have identified six distinct dimensions of SEBMs: (1) interaction model (P2P/C2C, B2C, B2B and the activities of civil society actors and government entities), (2) rights sold (temporary and permanent access), (3) resources that are shared (goods and services), (4) infrastructure (platform, intermediary), (5) market orientation (profit-driven and mission-driven), and (6) form of compensation (monetary and nonmonetary).

III RESEARCH METHODOLOGY

A. Research Approach

The aim of this paper is to provide a theoretically grounded explanation for how SEBM choices affect captured sustainable value. A qualitative research study was conducted, as the study is exploratory due to the fact that to date limited research has been done in this field. Our research is mainly inductive and the emphasis is on the discovery of new constructs rather than on testing existing theory. The research setting is presented in Fig. 3. The purpose is to explain how certain variables/constructs, business model choices (causes) and sustainable value types (effects), relate to each other [58], [59].

The case study approach was chosen, as it is well-suited for investigating contemporary phenomena in depth and within their real-life context, and it is also suited for addressing 'how' and 'why' questions focusing on contemporary events [60]. We have used a multiple case research design to explore the 'how' question. A multiple case design is a case study research in which more than one case is selected to develop a more robust understanding of the issue under examination. Comparing multiple cases enables a replication logic that is central to theory building [61].

Business model choices affecting sustainable value captured was analyzed by applying a five-step approach (Fig. 3) consisting of 1) extracting distinct dimensions of sustainable value and forming a sustainable value framework, 2) extracting distinct dimensions of SEBMs and forming a SEBM framework, 3) identifying specified value propositions and further synthesizing general

SEBM value attributes (“effects”), 4) analyzing sustainable value capturing as well as uncapturing, and 5) finally, identifying business model choices affecting sustainable value capturing and synthesizing business model attributes (“causes”). Steps 1 and 2 were carried through by reviewing previous literature and steps 3 to 5 by analyzing the selected cases.

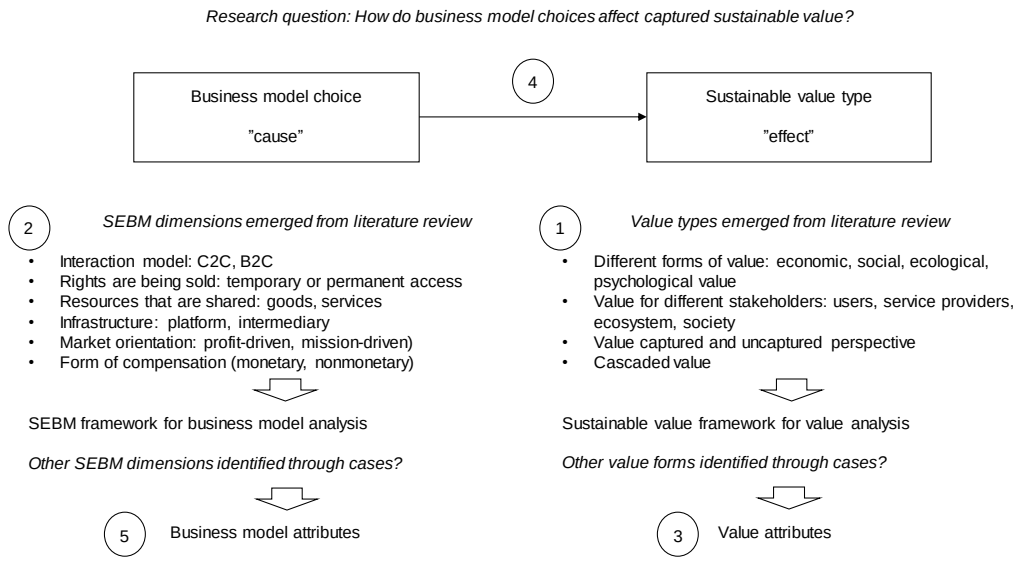

Fig. 3 Research setting

B. Case Selection

The cases were selected on the basis of reviewing sharing economy and SBM literature and other research on SEBMs, for instance Honeycomb 3.0 [11] was used. In this study, we focus on consumer business, and thus the cases cover business models based on P2P transactions and B2C transactions. As we define the sharing economy as an umbrella concept, the selected business models also cover profit and mission-driven organizations, different monetary and nonmonetary transactions and different trading activities, such as renting, swapping and donating. The aim was to identify different types of viable SEBMs. Twenty SEBMs were selected for closer analysis, summarized in Table II.

TABLE II
CASE COMPANIES

Sector	Company	Interaction model
Accommodation	Airbnb	P2P
	GuesttoGuest	P2P
	HomeExchange.com	P2P
	HomeAway	P2P
	Love Home Swap	P2P
Mobility	BlaBlaCar	P2P
	Blue Bikes (before Hubway)	B2C

	Car2go	B2C
	Turo (before RelayRides)	P2P
	Uber	P2P
	Zipcar	B2C
Food	EatWith	P2P
	FoodCloud	B2charity2C
	Shareyourmeal	P2P
	The Food Assembly	B2C
Consumer goods	BookMooch	P2P
	Fashion Hire	B2C
	Freecycle	P2P
	Peerby	P2P
	Rent the Runway	B2C

C. Data Collection and Analysis

The analysis was based on secondary data available on companies' websites, previous research, reports, and other public documents, as well as publicly available information. Each case involved similar types of data collection. First, basic data, such as general company details (e.g. the number of users, year of foundation) and general business model descriptions (e.g. interaction and transaction models) were collected. Then, a more thorough business model analysis was conducted by using a SEBM framework generated from previous literature. Further, a value analysis was conducted by using a sustainable value framework generated from previous literature as well. The data were classified into tables as a way to analyze and comprehend the data, and the tables also helped us to identify sustainable value and business model attributes within the synthesizing phase [62]. Finally, a case study narrative was written for each SEBM, describing business model choices and sustainable value capturing. An inductive approach was used to analyze the data, and the analysis was conducted by using the qualitative content analysis method [63]. The data collection and analysis were carried out through several iterations.

IV DISCUSSION ON THE FINDINGS

A. Sustainable Value Propositions

On the basis of the 20 SEBMs investigated in this study, we identified specified value propositions and synthesized further general SEBM value attributes (i.e., effects). In the following, we provide a summary of the SEBM value attributes (table III) and their specifications, i.e., sustainable value propositions for different stakeholders (table IV). These sustainable value propositions are the potential sustainable values different stakeholders aimed to capture. We found the following key value propositions: (1) economic value - cost savings, income, convenience and practicality, accessibility, profit, strong customer relationships, sustainable image, wealth, and equality, (2) ecological value – sustainable consumption, more efficient use of resources, eco-effectiveness, sustainability and livability of the environment, and (3) social and psychological value – social interaction, emotional value, and wellbeing.

SEBMs propose multiple economic benefits. For customers (e.g., guests, riders) the main economic benefits are cost savings, increased convenience and easy access. For example, guests can save money by finding cheaper accommodation options compared to traditional hotels, and

drivers and riders save money by sharing the cost of trips. P2P car sharing offers a virtually unlimited pool of vehicles to choose from; customers can drive a Smart car today and a Jeep tomorrow. The customer gains access to a vehicle when wanted and needed and without the hassle of vehicle ownership. Service providers (e.g., hosts, drivers) are allowed to earn rental money/additional income, share the cost of ownership and reduce the costs as well. For example, people can redistribute underutilized and unwanted items through reuse groups and earn additional income, or just avoid the costs related to items to be removed. The economic value for firms or platform operators is related to cutting the normal operating costs and having opportunities to increase profits through product-service or pure service business. The whole sharing ecosystem is growing. The ecosystem is full of agile players whose focus is scaling up, and there are many start-ups who offer value-added services. At the societal level, the sharing business aims at benefiting local economies by creating new jobs, stimulating micro-entrepreneurship and increasing equality. For example, accommodation sharing boosts tourism in underexplored areas of cities, and redistributing surplus food aims at preventing food poverty.

TABLE III
GENERAL SEBM VALUE ATTRIBUTES

Levels of value		Value attributes
User	Customer	Cost savings Convenience & practicality Accessibility Sustainable consumption Social interaction Emotional value
	Service provider	Income and/or cost savings Convenience & practicality More efficient use of resources Social interaction Emotional value
Service enabler/provider		Profit Cost savings Strong customer relationships Eco-effectiveness Sustainable image
Ecosystem		Stability & growth Sustainability
Society		Wealth Equality Wellbeing Livability of the environment

Within accommodation sharing, the main value propositions for sustainability are increasing the utility of unused spaces, enhancing sustainable use of spaces, managing capacity changes, reducing raw material consumption and the need for new buildings, connecting people, encouraging cultural exchange, and enhancing social cohesion and liberality. Besides social interaction with strangers and an opportunity to new friendships, hosts have the opportunity to use existing resources, i.e., their own houses and apartments, more efficiently, and guests have the opportunity to travel in a more sustainable way.

In the mobility sector, the main value propositions for sustainability are increasing the utility

of unused vehicles and enhancing sustainable use of vehicles. The ultimate goals are reduced car dependency, individual car ownership and vehicle miles traveled, which mean less cars on the road, less congestion, less pollution, decreased need for parking infrastructure and road expansion, more green space and cleaner, fresher air, decrease in energy dependency, as well as overall better health due to an increase in biking (e.g. Blue Bikes) and walking. Turo's mission is to put the world's billion cars to better use, and Zipcar's mission is to enable simple and responsible urban living. Zipcar sees a future where car sharing is dominant, and where car sharing strategies will be a requisite part of the planning for all urban, residential, and commercial developments. Uber's mission is to connect passengers with drivers seamlessly, making cities more accessible, opening up more possibilities for riders, and creating more business for drivers.

In the food sector, the main value propositions for sustainability are solving the social and environmental problems associated with food waste and food poverty, but also providing a healthy alternative to traditional takeaway fast food, building communities by bringing people together through food sharing, stimulating micro-entrepreneurship, and allowing unemployed people to earn some extra income. FoodCloud's mission is "to create an innovative solution for surplus food that empowers people, brings communities together and creates lasting positive social change". EatWith´s mission is to bring people around the world together, one meal at a time, and changing the way people eat, travel and interact with each other.

In the consumer goods sector, the main value propositions for sustainability are related to increased use of underutilized items and saved raw materials, demand-driven sustainable consumption, increased social cohesion and helping others, and modal shift from goods to services. For example, no one uses an electric drill all the time, but many people buy one just for the occasional need. According to Rent the Runway's internal research, on average an American woman buys 64 new pieces of clothing a year, half of which she wears just once, so their business model targets at enhancing more sustainable consumption. Freecycle's mission is to reduce waste and save precious resources by building a worldwide sharing movement.

TABLE IV
SUSTAINABLE VALUE PROPOSITIONS FOR DIFFERENT STAKEHOLDERS

	Accommodation sharing	Mobility sharing	Food sharing	Goods sharing
Sustainable value for users - customers (P2P, B2C business)				
Cost savings	Cheaper or free accommodation option, free access to practical residential amenities & supplementary services	Cheaper car rentals/rides, no need to buy an expensive vehicle, reduced driving costs	Cheaper or free food/meals/ dinners	Cheaper rentals or getting goods for free, no need to buy expensive goods
Convenience & practicality	More space and privacy, access to supplementary services (e.g. local advice, car sharing) & practical residential amenities (e.g. kitchen, washing machine)	Access to a vehicle when needed and without the hassle of vehicle ownership (incl. maintenance and insurance), personalized drop-offs and pickups, one-way rentals	Healthy meals at affordable price in direct vicinity	Decreased need for storage space, saved time through internet-based shopping or sharing goods with neighbors
Accessibility	Possibility to stay in a 'non-touristy' area and real neighborhoods	Rides between cities/areas/places where public transit or taxis typically do not go, access to a broad & unique selection of vehicles, access to a car even if one cannot afford	Access to healthy, home-cooked and fresh food	Access to a range of goods in own neighborhood (e.g., power tools; Peerby) or broad & unique selection of goods (e.g., designer handbags; Fashion Hire)

		a vehicle of one's own		
Sustainable consumption	A more sustainable way of traveling (e.g., "living like a local" and using a bicycle)	Reduced & smarter driving (e.g., use of newer vehicles, optimized trips, shared rides)	Healthier and more sustainable eating	Reduced material consumption and need for new goods
Social interaction	(face-2-face) Interaction with service providers, staying on a stranger's couch, experiencing different lifestyles, new friendships	(f2f) Interaction with service providers, getting a traveling companion, new friendships	(f2f) Interaction with service providers, social dining, new friendships	(f2f) Interaction with service providers, interaction with neighbors, new friendships
Emotional value	Feeling of being in a home over a hotel, authentic atmosphere and "living like a local" experience, being part of a group/community	Being part of a group/ community	Insights into different cultures, being part of a group/community	Being part of a group/ community
Sustainable value for users - service providers (P2P business)				
Income and/or cost savings	Earning rental money, reducing the total cost of the property	Earning rental money, sharing the cost of the trip, reducing the total cost of the vehicle	Earning additional income, sharing the cost of a meal	Earning additional income, no need to pay for items to be removed
Convenience & practicality	Flexibility, possibility to offer capacity for sale without having to make upfront investments	Flexibility (e.g., flexible working hours, Uber)	Flexibility, possibility to act as a chef without having to make the career decision to run a restaurant	Flexibility
More efficient use of resources	Having one's home occupied while traveling, having an extra room/bed occupied	Increasing the utilization rates of vehicles	Preventing food waste	Increasing the utilization rates of goods, preventing waste and material from going to landfill
Social interaction	(f2f) Interaction with customers, opening one's door to strangers, new friendships	(f2f) Interaction with customers, traveling companion, new friendships	(f2f) Interaction with customers, social dining, new friendships	(f2f) Interaction with customers, interaction with neighbors, new friendships
Emotional value	Being part of a group/community	Being part of a group/ community	Being part of a group/ community, selling portions of one's own dinners, getting feedback and feeling good, gift surplus food for a good cause	Being part of a group/ community, helping neighbors, gifting underutilized items for a good cause, finding a good home for special items
Sustainable value for service enabler (P2P business) or service provider (B2C business)				
Profit	Pure service business; profits without owning anything (P2P), high volumes through the network effects for growth (P2P)	Pure service business; profits without owning anything (P2P), product-service business (B2C)	Pure service business; profits without owning anything (P2P), increased profits through shorter supply chains (B2C)	Pure service business; profits without owning anything (P2P), product-service business (B2C)
Cost savings	None of the normal operating costs, e.g., repair, cleaning (P2P)	None of the normal operating costs, e.g., maintenance (P2P)	Redistributing surplus food instead of paying for food to be sent to landfill	None of the normal operating costs (P2P), e.g., warehousing
Strong customer relationships	Long-term customer relationships, new customer segments	Long-term customer relationships, new customer segments	Long-term customer relationships, new customer segments	Long-term customer relationships, new customer segments
Eco-effectiveness	Acting as a service enabler (P2P)	Acting as a service enabler (P2P), acting as a product-service provider with a fleet of new, fuel-efficient and electric vehicles (B2C),	Acting as a service enabler (P2P), acting as a product-service provider (B2C)	Acting as a service enabler (P2P), acting as a product-service provider with quality products (B2C), keeping goods in circulation

		integrating car sharing with the public transport network		
Sustainable image	Enhancing more sustainable use of spaces and way of living and traveling, enabling social connections	Enhancing more sustainable use of vehicles, way of transit and way of driving, enabling social connections	Enhancing more sustainable use of food and healthier eating, enabling social connections	Enhancing more sustainable use of goods and way of consumption, enabling social connections
Sustainable value for business ecosystem actors				
Stability & growth	Growing ecosystem where different startups offer value-added services (e.g. cleaning, insurance services, maintenance, photographers), active partnering and scale-up targets	Growing ecosystem where different startups offer value-added services, active partnering (also with traditional car companies) and scale-up targets	Emerging ecosystem where different startups support each other	Growing ecosystem where traditional business adopts PSSs and sharing practices
Sustainability	Enhancing the concept of smarter cities, incorporating a sustainable way of traveling and living in environmental planning	Enhancing the concept of smarter cities and modal shift from privately used cars to shared vehicles/ public transport/ bicycles/ walking, incorporate car-sharing in environmental planning	Enhancing the concept of sustainable food consumption and preventing food waste	Enhancing a modal shift from goods to services
Sustainable value for society				
Wealth	New jobs, revenue for locals, incl. hosts and local businesses	New jobs, revenue for locals, (in the long term) decreased energy dependency	New jobs, revenue for locals (e.g., extra income to unemployed people), micro-entrepreneurship	New jobs, revenue for locals
Equality	Boosted tourism in new areas, revenue for low-income people, cultural exchange, traveling opportunities for middle class families	Enabling access to cars to people who cannot afford to own vehicles	Revenue for low-income people, preventing food poverty	Enabling people who cannot afford access to expensive goods designer wardrobes, a new pair of shoes or a power drill
Wellbeing	Increased social cohesion, community based on trust and goodwill	Increased social cohesion, better health due to increase in biking and walking	Increased social cohesion, provided health	Increased social cohesion
Livability of the environment	Increased utility of underutilized spaces, better capacity management, reduced need for new buildings and raw material consumption	Reduced individual car ownership, vehicle-miles traveled and car dependency and further less cars, less congestion, less pollution, and (in the long term) decreased need for parking lots and road expansion, and more green space	Avoided/reduced food waste and food poverty	Increased utility of underutilized goods and saved raw materials, reduced waste

B. Value Uncaptured

Price issues. For example, accommodation-sharing sites promote their services at lower prices compared to traditional hotel accommodation, but the prices are not always lower, especially at the high season and in famous locations. Within mobility sharing, the users have complained about Uber's surge pricing and lack of transparency [64], and the customers feel that they are

exploited by Uber by changing the prices constantly. Surge pricing means that Uber fare rates increase automatically when taxi demand is higher than the number of drivers nearby.

Trust and safety issues. Within accommodation sharing, the hosts have faced criminality (e.g. theft) or damage, and if the guests do not admit to being responsible for the damages, the hosts will have problems with their own insurances and receiving compensations. Privacy problems may also exist, for example, Airbnb has faced lawsuits over hidden cameras in rented apartments. From the safety perspective, hotels are regularly inspected to ensure that they do not pose risks to the visitors, but Airbnb and other accommodation-sharing hosts face no such inspections. Within P2P mobility sharing, the drivers do not have professional taxi licenses, and the service enablers do not give any assurance that the driver's car insurance provides adequate cover. It was found in a CNN investigation that over 100 Uber drivers in the U.S. have been accused of abusing their passengers verbally or assaulting them sexually in the past years.

Limited availability. We found limited availability and unsuitability for specific needs (e.g., date and location requirements) in all the sectors investigated in this study. For example, simultaneous house swap does not suit for short trips and specific date and location requirements. Overall, one of the biggest challenges for car sharing is access. People may want to use car-sharing services, but fail to find any vehicle nearby. Existing car owners might not get rid of their vehicles, because shared vehicles are not always available, especially on weekends. BlaBlaCar does not operate in countries where the price of gas is not high enough to motivate consumers to look for travel alternatives to driving. Zipcar seems more likely to be used in neighborhoods where convenient public transportation access is not available. SEBMs rely on a critical mass of people, which implies that the market can only be sustained in a limited area.

Instability and competition. SEBMs are becoming mainstream alternatives to traditional providers (not without protests), but the whole sharing ecosystem is not stable yet. Whilst the overall sharing sector is growing rapidly, there is instability among individual SEBMs. For example, the mobility-sharing ecosystem is a rather siloed system. There are many operators and different sharing options, which might lead to substitution, but also confusion among users.

Cannibalization. SEBMs are accused (by competitors) of having a negative impact on traditional business. For example, Airbnb takes guests from the traditional accommodation sector and has a negative impact on the revenue of local hotels [65], and Uber is criticized for having a negative impact on local taxi drivers' revenue. A study by Martin and Shaheen [66] shows that one-way car sharing has an impact on taxis as well: car2go was found to compete directly with taxis, as most respondents used taxis less as a result. This highlights the assessment of system-level impacts and exploration of general effects of moving from traditional business to sharing economy.

Legal issues. Within accommodation sharing, investors might buy and renovate real estate just for the purpose of renting to tourists. Most cities and states regulate and tax hotels, and tourists are an important source of tax revenue, but not all Airbnb customers pay the taxes required by the law. Within mobility sharing, P2P business models are also criticized for evaded taxes, and it has been difficult to find policy holders offering insurances that cover personal vehicles that are used for P2P rentals. The sharing economy for food is not legalized everywhere, and within goods-sharing, people may resell goods professionally and evade taxes as well.

Ecological and social harm or missed value. Within accommodation sharing, ecological value is uncaptured if hosts rent their "second" or "third" homes and act as professional landlords, or if people travel across the world, which creates environmental impacts through increased transport. The vast majority of Airbnb's listings are now "entire home" rentals: self-contained flats or villas,

not spare rooms of hosts, and the majority of HomeAway´s business is in second homes that are rented for most part of the year. Furthermore, the number of reasonably priced long-term renters will decrease, if landlords see more profit in short-term stays. Guests do not always interact with local home owners, because many of the "hosts" collaborate with professional rental managers.

Within car sharing, consumers who do not own a car, may move partly away from using public transport and bicycling because they have access to a 'private' car without the need to invest in one. Car2go substituted for the use of other public transit modes, such as urban rail and bus, in four of the five cities studied in the survey of the impacts of car2go [66]. Additionally, only two to five percent of the active members said that they had sold a car as a result of car2go's operations, and only seven to ten percent said they had avoided buying a car. P2P business models may also replace lower emission fleets with vehicles that have poorer emissions. In general, taxi emission standards in advanced cities have led to significant increases in hybrid taxis.

According to Morone et al. [67], even if food sharing could be an effective way to tackle food waste at the consumer level, the adoption of food sharing practices by households will not automatically lead to reduction of food waste. Similarly, the adoption of goods sharing will not automatically lead to saved raw materials. Redistributed goods are also used as additional items, not replacements for new purchases. Within food and goods sharing, ecological risks are related to increased handling and transport. For example, Rent the Runway encourages people to rent clothes instead of buying, but it also encourages the users to choose a membership model that allows unlimited swaps, leading to increased packaging, shipping and cleaning.

TABLE V
VALUE UNCAPTURED

	Accommodation sharing	Mobility sharing	Food sharing	Goods sharing
Price issues	Price fluctuation, all prices are not lower compared to the traditional business model	Price fluctuation, all prices are not lower compared to the traditional business model		Price fluctuation, all prices are not lower compared to the traditional business model
Trust & safety issues	Privacy problems, no regular inspections, criminality (e.g., theft) or damage, limited/lack of/problems with guarantees	Safety (e.g., Uber drivers accused of sexual assault), limited/lack of insurances	Food safety (e.g. food poisoning, salmonella, listeriosis)	Poor quality of goods offered, goods are marked as "lost in the mail"
Limited availability	Unsuitability for specific needs (e.g., date and location requirements)	Limited geographical availability, limited availability in rush hours	Limited geographical availability	Limited geographical availability
Lack of critical mass of people	People view home sharing or exchange as not safe or hard to organize, people organize it themselves directly or via social networks	People view sharing/ renting their cars to strangers as not safe or hard to organize, people organize it themselves directly or via social networks, insufficient number of users in a limited geographical area	People view sharing/ reselling food as not safe and are afraid to be held liable in case someone claims to have gotten food poisoning, insufficient number of users in a limited geographical area	People view sharing/ renting their goods to strangers as not safe or hard to organize, people organize it themselves directly or via social networks, insufficient number of users in a limited geographical area
Instability and competition	Competition due to similar startups, Airbnb dominates, protests against SEBMs	Competition due to similar startups, siloed ecosystem, protests against SEBMs	Young and limited markets	Lots of self-organized groups
Cannibalization	Negative impact on traditional business (revenue of local hotels), travelers have access	Negative impact on traditional business (taxis, public transit	Negative impact on traditional business (restaurants, retailers)	Negative impact on traditional business (retailers)

	to practical amenities (e.g., kitchen, washing machine) and even cars, so they do not pay for so many restaurant meals, need laundromats or rent a car	modes)		
Legal issues	Investors buy and renovate real estate just for the purpose of renting to tourists and evading taxes	Evaded taxes, difficult to find policy holders offering insurances that cover personal vehicles that are used for P2P rentals	Selling homemade food is not legalized	People resell or sell homemade goods professionally and evade taxes
Ecological and social harm or missed value	Renting "second" or "entire home", professional rental and contacts with third parties, missed responses due to inactive listings, increased carbon footprint through increased traveling across the world, decreased amount of long-term renters and reasonably priced rented apartments, "commercialized neighborhoods"	Choosing car sharing over walking, bicycling or public transit, replacing lower emission fleets with vehicles that have poorer emissions, not giving up individual car ownership	No decrease of food waste, increased transport	Redistributed goods used as additional items, not replacements for new purchases, increased consumption, increased handling and transportation

C. Business Model Choices

On the basis of the 20 SEBMs investigated in this study, we have identified eight business model attributes (table VI) that affect sustainable value capturing. In the following, we give an overview on these attributes ("causes") with some examples.

Interaction model. In this study, we focused on consumer business models, P2P and B2C interactions. From the point of view of sustainability, we found differences between these models, but it cannot be said that one model is more sustainable than the other. Both models show cost savings, social interaction is emphasized within P2P models, but otherwise sustainable values are crisscrossing. For example, from the ecological point of view, B2C car-sharing companies often have newer and more fuel-efficient cars, whereas the variation in the fleet is much higher within P2P car-sharing. P2P business models offer a virtually unlimited pool of assets, such as vehicles or houses, to choose from. Airbnb, Love Home Swap and other accommodation-sharing sites have listings across the world. While fleet-based car-sharing services are predominantly found in larger metropolitan areas and in major locations, P2P car-sharing has no geographic restrictions, which leads to increased accessibility. Because the same regulations are not suitable for facilitating B2C and P2P markets [68], or the same rules are not followed, some of the P2P business models are accused of operating in a grey area, for example Airbnb users are accused of evading taxes.

Offering. We focused on four main offerings: accommodation, mobility, food and consumer goods, and the SEBMs investigated in this research cover both categories of exchange: access over ownership (PSS) and transfer of ownership (product redistribution). We found that social values are particularly emphasized in accommodation sharing, whereas in the mobility sector SEBMs focus more on ecological values, such as reductions in vehicle-miles traveled, pollution and congestion. While car sharing, accommodation sharing and PSSs are becoming mainstream alternatives to traditional providers, food sharing operates still in a niche market. Service providers have struggled with profitability and fears regarding food safety. There are differences

between the PSS and redistribution models, but we found that both have an opportunity to enhance sustainability. For example, PSSs target to increase the utility of underutilized resources by sharing goods, and redistribution models by circulating goods. All SEBMs are not highly differentiated from the more traditional companies within their industry, which might lead to cannibalization. For example, Uber is criticized for resembling the traditional taxi business and having a negative impact on local taxi drivers' revenue, whereas the ride-sharing company BlaBlaCar is focused on long-distance drives. The average BlaBlaCar journey is city-to-city and a distance of 200km, meaning they pose little competition to taxi drivers. On the other hand, it will not necessarily be bad for system level sustainability if sharing-based business models replace traditional business. In the mobility sector, car-sharing business models are divided into round-trip (e.g., Zipcar) and one-way models (e.g., car2go). One-way car sharing enables the members to begin and end a trip at a different location, which will potentially lead to decreased vehicle miles traveled. Within the consumer goods sector, Peerby has purposively chosen to offer a demand-driven platform, opposed to other item-sharing platforms, meaning that people in need of a certain item post a request, which could lead to smarter consumption.

TABLE VI
GENERAL SEBM ATTRIBUTES

Business model attributes	Specifications
Interaction model	P2P/C2C B2C
Offering	Shared good or service Temporary/permanent access Service type Demand-/supply-driven
Geographic scope	Global Regional Local
Market orientation	Profit-driven Mission-driven
Value network	Social companies Growing ecosystems Sustainable systems
Trust building mechanism	Review system Booking procedure and payment system Rules Guarantees and insurances
Form of compensation	Monetary Nonmonetary
Revenue model	Service/commission fee Membership/subscription (flat & tiered) Pay per use Freemium
Pricing model	Pricing mechanisms Pricing rules Price discovery

Geographic scope. The SEBMs investigated in this study operate both in local and global markets. In accommodation sharing, Airbnb and Love Home Swap have hosts in 190 different

countries, which encourages traveling all over the world. This increases cultural exchange, but at the same time emissions through increased miles traveled. More than 50% of GuesttoGuest's home exchanges are made within the same country or a neighboring country, as the company's target users look for places that are accessible by not-too-expensive transportation. Operating in a limited geographic area leads to a decrease in transportation, but for several service providers/enablers the biggest obstacle is the acquisition of a sufficient number of users in a specific limited geographical area. For example, for Peerby, which offers a platform where people can borrow and share items with their neighbors, Brooklyn as a whole would be a too big area, because the transaction costs associated with traveling would be too high compared to the value added.

Market orientation. Within the SEBMs studied in this research, both profit-driven and mission-driven business models exist, and both models have sustainability targets. Kodransky and Lewenstein [69] have found that unless the operator is a social enterprise, or unless the government mandates a focus on low-income communities, the operators are unlikely to target low-income users. We also found that with a profit-driven business model, low-income people are not the main customer segment, or truly ideological goals are not central. Mission-driven FoodCloud collaborates with charities and aims to reduce food poverty by donating surplus food, but at the same time, a successful profit-driven SEBM might create and capture sustainable value widely and increase overall wealth and wellbeing as well.

Value network. We found that collaborating with social companies, partnering actively at the ecosystem level and integrating SEBMs with wider sustainable systems leads to an increase in sustainable value. For example, FoodCloud collaborates with charities and aims to reduce food poverty, and BookMooch collaborates with a number of organizations that support worthy causes and offers an option to donate books for a good cause, such as children's hospitals or African literacy programs. At the ecosystem level, the entire accommodation sharing industry is flourishing and growing – mostly due to Airbnb's success. Airbnb's business model has accelerated the rise of different startups offering value-added services, such as cleaning, taking photographs and handing out keys. Within mobility sharing, by integrating car sharing into the transportation network and incorporating car sharing into new real estate developments, companies support the modal shift from privately used cars to shared vehicles/public transport/bicycles/walking and the concepts of smarter and sustainable cities.

Trust building mechanism. Trust is the keystone of a SEBM. As SEBMs rely on trust between strangers, potential users may be deterred by a lack of confidence in the sharing groups themselves and the quality of the items offered. Trust is fostered through review systems, reliable booking procedures and secure payment systems, different rules, guarantees, and insurances. Review systems are based on verified public profiles, which include recommendations and reviews by other users. Regarding booking and payment, BlaBlaCar ensures passengers' engagement through charges at the time of booking. Airbnb's guests pay for their reservation in advance by a credit card, and Airbnb holds the payment until 24 hours after the guests arrive to ensure that the accommodation is as described, and then transfers the money to the host. For many women, carpooling has raised concerns about security, and that is why BlaBlaCar has created a Ladies Only rule, to allow members to plan a ride where the driver and all passengers are women. Regarding additional services, Airbnb offers a guarantee of insurance coverage for damage and theft to the host's property free of charge, and Love Home Swap offers a tailor-made protection package, which is subject to a charge.

Form of compensation. In this study, the SEBM examples covered monetary as well as

nonmonetary forms of compensation, and different trading activities, such as renting, swapping, pooling and donating. We found that people might not act without monetary incentives. For example, Freecycle's and BookMooch's membership figures are likely to overstate the actual participation, as many members are inactive or have joined multiple free reuse groups. A freemium is a plan to get lots of members from all walks of life, but it is not a plan to make money or to get lots of active users. We also found differences in the captured value between different trading activities. For example, Home exchange sites (e.g., GuesttoGuest, Love Home Swap) are different to rental sites (e.g., Airbnb, HomeAway) because their business models are based on pure swapping. The users of home exchange sites save money by swapping and acquiring accommodation for free. This is not about making money from existing assets, but about saving money. Safety is based on reciprocity, as both users entrust their homes to one another and both will have the same questions about safety. However, simultaneous home swap, which is free, does not suit trips that have to meet specific date and location requirements. So far, home rental sites have attracted many more customers than home swapping sites. People might view home exchange as unsafe or hard to organize.

Revenue model. Within the SEBM examples studied in this research, the following revenue models were used: (1) service/commission fee, (2) flat membership/subscription, (3) tiered membership/subscription, (4) membership + pay per use, (5) pay per use, (6) freemium, and (hybrid). A hybrid model is a combination of different revenue mechanisms. It is more complicated but it could be a strategy to reach various customer segments and decentralize risks. *Service/commission fee* models are most common in the P2P business, and they are generally successfully implemented. However, since the transactions are low (e.g., Shareyourmeal: 4€ on average for a meal), collecting transaction fees covers only a part of the cost. The only way to increase profitability is to create economies of scale and increase the number of users. This implies that the market can only be sustained in a limited number of urban areas. In *Flat and tiered memberships/subscription* a company may charge a flat membership fee (monthly or annual) regardless of usage (e.g., HomeExchange.com), or offer a range of subscriptions at different prices based on the frequency of use or the level of additional services (e.g., Love Home Swap). HomeExchange.com offers annual membership that gives access to unlimited home exchanges, encouraging more travel, meeting more new people and the exploring different cultures. However, it increases a person's eco-footprint due to the increased travel involved. HomeAway, HomeExchange.com and Love Home Swap develop long-term customer relationships through annual memberships, but companies that have experienced greater growth in the number of users (Airbnb and GuesttoGuest) do not demand membership. Within goods sharing, Rent the Runway encourages people to rent clothes instead of buying, but it also encourages the users to choose a membership model that allows unlimited swaps, leading to increased cleaning, packaging and transportation. In *Pay per use* the usage-based revenue mechanism means that revenue is generated only during the actual usage of the product or service [70]. Usage can be expressed in time units (e.g., cycling hours for a bicycle), in other units that correspond to the usage dimension (e.g., miles for a car) or even in a combination of units.

Pricing model. We found that different pricing mechanisms and rules affect the captured or uncaptured sustainable value as well. Within car sharing, charging for actual usage and keeping the hourly fee low and the mileage fee high, the company encourages the use of the shortest routes and slower, more fuel-efficient driving. Furthermore, keeping the rates lower at night time can lead to decrease in congestion. Hybrid cars have the lowest price in the Zipcar system, which encourages the choosing of a green vehicle. BlaBlaCar's drivers are not allowed to make a profit,

only to share the costs of a journey, which does not encourage driving extra kilometers. Further, as the drivers do not make profit, only cover their costs, there are no regulation, tax or insurance problems. Price discovery mechanisms can build on a pricing system in which the prices are fixed or set by sellers or by buyers or by negotiating. Within P2P models, setting the right rental price is often the service provider´s responsibility. They might be attracted by exploitative prices. On the other hand, in highly competitive markets they might set the prices too low and forget the costs.

V CONCLUSION

The purpose of this research was to explain how SEBM choices affect sustainable value capturing. We carried out an extensive literature review on sharing economy in connection with SBMs and studied twenty SEBMs in the accommodation, mobility, food, and consumer goods sectors. We identified specified value propositions for different stakeholders, and synthesized SEBM value attributes ("effects"). These sustainable value propositions are the potential sustainable values different stakeholders aimed to capture. We found 22 SEBM value attributes, which implies that SEBMs hold the promise to enhance system-level sustainability. Further, we analyzed how sustainable value propositions are captured. We found that it is not self-evident that all sustainable value propositions are delivered and captured in reality. We observed value uncaptured and complex indirect effects, such as trade-offs between or within value forms, stakeholder conflicts, trade-offs between different time frames, and other negative side effects. Finally, we identified business model choices that affect sustainable value capturing, as well as uncapturing and synthesized SEBM attributes ("causes"). These business model attributes are: interaction model, offering, geographic scope, market orientation, value network, trust building mechanism, form of compensation, revenue model, and pricing model.

This research brought together the fields of sharing economy and SBMs and investigated SEBMs as examples of SBMs. This research contributes to several calls by focusing on sharing economy in connection with SBMs, analyzing the sustainability impacts of SEBMs, including different value forms and levels of stakeholders, conducting a multiple case study and investigating different sharing practices, and focusing on business model design options in order to exploit the sustainability potential of the sharing economy.

This research can have practical implications for managers planning to build their business models in the direction of sharing economy and sustainability, by introducing SEBM attributes and sustainable value attributes, and explaining how these "causes" and "effects" are related to each other. We found that business model choices affect the captured and uncaptured sustainable value. The business model choices, and their implications to potential captured and uncaptured value have to be analyzed and discussed carefully early in the formation of a new business. The research process used in this study can also be seen as valuable from the managerial perspective. Managers can explore their business models through the frameworks and examples presented in the study.

There is a limited literature on sharing economy in relation to value capturing and SBMs. Therefore, we present a number of avenues for future research. First, to deepen the understanding of how business model choices affect sustainable value capturing, it would be valuable to (1) broaden this research to other sectors, (2) focus on one specific industry sector and its sub-classes in depth, and (3) study a specific business model attribute and its underlying logics more closely. Second, to capture sustainable value through SEBMs, a holistic and system-level approach is

essential. To address sustainability challenges, there is a need to consider complex indirect effects, such as trade-offs between or within triple bottom line performance goals, stakeholder conflicts, trade-offs between different time frames, and other negative side effects in depth. More research is also needed on the wider social and political changes that are required to support sustainable value capturing. Third, to understand the sustainable value captured through new disruptive SEBMs, value assessment at both firm and system level is needed. There is also a need for new metrics and assessment tools with which to analyze business models in the sharing economy. Fourth, this study focused on SEBMs operating mainly in Europe and the U.S., but it would be valuable to repeat this study in the context of developing countries, and compare the results.

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Publication III

Laukkanen, M., Manninen, K., and Huiskonen, J.
Revealing the sustainable value creation and value capture potential with a multicapital approach

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Revealing the Sustainable Value Creation and Value Capture Potential with a Multicapital Approach

Minttu Laukkanen,[1]* Kaisa Manninen,[1] Janne Huiskonen[1]

[1]LUT University – LUT School of Engineering Science

*Minttu.Laukkanen@lut.fi

Abstract

This paper clarifies the concepts of value creation and value capture related to the sustainable business model. Additionally, the paper applies a multicapital approach combined with triple bottom line, multi-stakeholder, and system dynamics perspectives, and concretises and demonstrates sustainable value creation and value capture potential in a case study.

Keywords

Sustainable business model, value creation, value capture, multicapital approach

Introduction

As a reflection of corporate sustainability strategy, the sustainable business model (SBM) translates strategic objectives into the business logic of the company and other daily operations and value creation activities (Rauter et al., 2017). The SBM aims to create greater positive environmental and societal value overall, optimising the value for the company itself and a wider stakeholder network, including society and the environment (Bocken et al., 2019). The essential functions of any business model are the value propositions, value creation, and value capture mechanisms employed (Chesbrough, 2007; Teece, 2010). In SBM research, the concepts of sustainable value proposition and sustainable value creation have come to the fore of the discussion (e.g. Bocken et al., 2019; Patala et al., 2016; Sulkowski et al., 2018; Yang et al., 2017), but the value capture of the SBM is the least explored element (Morioka et al., 2018), in spite of the fact that it is equally critical. The value capture represents the value that the company generates for itself from its value proposition (Abdelkafi and Karl Täuscher, 2016).

An understanding of sustainable value creation is essential for targeting the Sustainable Development Goals (SDGs) (United Nations, 2019). Furthermore, an understanding of value capture logic is vital for the successful implementation and diffusion of SBMs. A company that cannot earn a profit from its value creation activities cannot sustain those activities over time (Chesbrough, 2007). Companies are mainly interested in creating sustainable value if it brings economic benefit (Yang and Evans, 2019), i.e. increased revenue or decreased costs (e.g. Engert et al., 2016; Schaltegger et al., 2012). Indeed, it is unrealistic to expect commercially oriented businesses to fully refocus on sustainability challenges and value creation for the common good (Agafonow, 2013; Dyllick and Muff, 2016). However, the value captured often tends to be intangible (Morioka et al., 2018), and companies fail to see the full value capture potential. This raises the need for research on how companies can translate sustainable value created to the other stakeholders into the captured value for themselves. New perspectives on assessing the full value capture potential are needed.

This study aims to clarify sustainable value creation, and especially, value capture potential. As Figure 1 presents, value creation is a prerequisite for value capture, yet value capture is a necessary driver for a company to engage in value creation. Even if the value capture potential exists, it may not be fully visible for companies. This study helps companies to recognise the value capture potential and motivate them to create sustainable value. Furthermore, realised value capture motivates companies to create even more sustainable value, leading to a virtuous circle. To address this aim, this study combines the previous literature and findings from an empirical case concerning the sustainability strategy work of the Kekkilä Group in 2018.1 The study first conceptualises the concepts of value creation and value capture related to the SBM. This study further

1 http://kekkila-bvb.com/

applies a multicapital approach (e.g. McElroy and Thomas, 2016) as a promising perspective on assessing sustainable value creation and value capture potential.

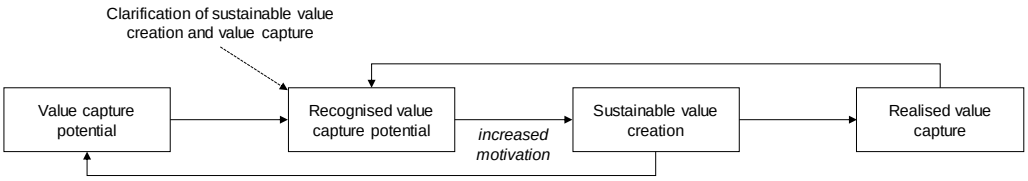

Figure 1. Conceptual framework of the study

Approach

Multicapital approach

Instead of focusing solely on creating customer value and capturing profits, (Chesbrough, 2007; Teece, 2010), companies aim to create economic, environmental, and social value for multiple stakeholders through new SBMs (den Ouden, 2012; Sulkowski et al., 2018; Yang et al., 2017). The focus is not merely on short-term profit maximisation, but on other forms of non-monetary value and maximising long-term wellbeing (den Ouden, 2012; Lankoski and Smith, 2018). The multicapital approach is proposed to broaden the view from shareholder benefits and the generation of economic capital to considering the impacts on society and the environment, and other forms of vital capital (McElroy and Thomas, 2016).

The capital-based philosophy itself is not a new idea, and there is an emerging discourse of reporting on multiple capitals in the areas of corporate reporting and organisational accounting (Coulson et al., 2015). Recently, the capital-based approach is proposed to connect corporate sustainability performance with the concept of strong sustainability (Nikolaou et al., 2019). However, in the SBM literature, multiple capital is seldom used. Within SBMs, a capital-based approach refers to maintaining and regenerating natural, social, and economic capital (i.e. sustainable value creation), while capturing economic value (Schaltegger et al., 2016).

The capital represents stocks of value that are the basis of the company's value creation. Furthermore, all companies increase, decrease, or transform capital through their activities (IIRC, 2019). The multicapital approach assesses the performance of a company in terms of what its impacts on vital capital are (McElroy and Thomas, 2016). There are different categorisations for vital capital, e.g. definitions used in the Integrated Reporting

framework,2 the Five Capitals Model,3 and the Multicapital Scorecard,4 but when generalised, multicapital can be categorised as economic (financial and non-financial), manufactured, intellectual, human, social and relationship, and natural. Natural capital (N) consists of all renewable and non-renewable natural resources and ecosystem services (e.g. air, water, land, minerals, forests, biodiversity, and ecosystem health). For example, when creating environmental value, such as increased biodiversity, the aim is to increase natural capital, whereas responsible use of resources is linked to protecting natural capital. Human capital (H) consists of knowledge, competencies, skills, experience, health, values, attitudes, motivation, and the ethical entitlement of individuals. Social and relationship capital (SR) refers to the institutions and the relationships within and between communities, groups of stakeholders, and other networks of individuals sharing their intellectual and human capital. Intellectual capital is embedded in the other capital, for example, through personal knowledge. Manufactured capital (M) consists of physical objects, systems, or ecosystems created and/or cultivated by human beings, and is used to create products and services, such as equipment and infrastructure. Financial capital (F) refers to the pool of funds available to a company, whereas non-financial capital (NF) may or may not be monetised, as with brand value.

Sustainable value creation and value capture potential from the multicapital perspective

To identify the forms of sustainable value creation and value capture from the multicapital perspective, we reviewed the scientific literature on SBMs and corporate sustainability. We used the Finna search service of the Lappeenranta Academic Library, which has access to 109 databases, such as EBSCOhost, Elsevier SD Freedom Collection, SAGE Premier, Scopus, ProQuest Central, and the Wiley Online Library. To obtain a comprehensive view, we included practice-related business studies (FIBS, 2018; Future-Fit, 2019; Kiron et al., 2013) in the literature review. We analysed the data using the thematic content analysis method (Myers, 2013), resulting in the summary of sustainable value creation and value capture potential presented in Table 1.

Sustainable value creation potential refers to the different general sustainable value forms companies aim to create for multiple stakeholders. For example, SBMs consider the health and safety of employees, customers, and citizens through carefully planned and managed processes, product responsibility, and value creation activities contributing to the wellbeing of society, e.g. healthy living. The identified sustainable value forms represent different types of vital capital and the three dimensions of the triple bottom line (McElroy and Thomas, 2016). We further identified value capture potentials, which describe how part of the value generated for stakeholders can be transformed into value useful for the company (Geissdoerfer et al., 2018). To identify these value capture potentials, we reviewed studies of the relationship between corporate sustainability

2 http://integratedreporting.org/

3 https://www.forumforthefuture.org/

4 http://www.multicapitalscorecard.com/

activities and company performance, as well as the literature on drivers and motives for sustainability actions. We found cost and revenue impacts as direct financial motivations, as well as several other business case drivers and non-economic value drivers, reflecting the fact that the objective of business may also be something other than profit maximisation (Lankoski and Smith, 2018).

Table 1. Sustainable value creation and value capture potential ([1] Azapacic, 2003; [2] Bocken et al., 2019; [3] Evans et al., 2017; [4] den Ouden, 2012; [5] Future-Fit, 2019; [6] Nikolaou et al., 2019; [7] Patala et al., 2016; [8] Bansal and Roth, 2000; [9] Engert et al., 2016; [10] FIBS, 2018 ; [11] Kiron et al., 2013; [12] Schaltegger et al., 2012; [13] Svensson et al., 2018; [14] Ditlev-Simonsen and Midtunn, 2011; [15] Saeidi et al., 2015; [16] Hockerts, 2015.)

Sustainable value creation potential		**Source**
Environmental bottom line: natural capital		
Resources (N)	Responsible use of resources (materials, water, energy); use of renewables; reduced use of finite resources; reduced need for physical goods/resources	1; 2; 3; 4; 5; 6; 7
Emissions (N)	Reduced emissions; pollution prevention (air, water, land)	1; 2; 3; 4; 5; 6; 7
Waste (N)	Reduced waste and waste prevention; waste management	2; 3; 4; 6
Biodiversity (N)	Secured/increased biodiversity	1; 3; 4; 6; 7
Liveability of the environment (N)	The physical beauty of nature; responsible land use; reduced noise	1; 3; 4; 7
Environmental wellbeing (N)	Increased and ensured long-term wellbeing; positive environmental value, e.g. afforestation	2; 4; 5
Social bottom line: human, social and relationship, and manufactured capital		
Health and safety (H/SR)	Product responsibility; customer/employee/citizen health and safety; ensured long-term wellbeing of society	1; 2; 3; 4; 5; 6; 7
Labour standards and practices (H)	Decent working conditions, e.g. wages, benefits, safety at work, job satisfaction	1; 3; 7
Stakeholder and human rights (SR)	Respecting employee, stakeholder, and human rights, e.g. no child or forced labour	1; 5; 6; 7
Ethical principles (SR)	E.g. honest competition, anti-corruption; no harmful social impacts	5; 6; 7
Equality and diversity (H)	Equal opportunities and non-discrimination	1; 3; 4; 6; 7
Training and education (H)	Employee/customer/stakeholder training and education	1; 6
Partnerships (SR)	Fruitful and reciprocal relationships	1; 4
Community development (SR)	Belonging; support of locals; secure livelihood; encouraged sufficiency and sustainable living	2; 3; 4; 6; 7
Social wellbeing (H/SR)	Happiness; the wellbeing of larger groups of people	3; 4; 5
Economic bottom line: economic financial and non-financial capital		
Employment (NF, F)	Job creation, employment	1; 6; 7
Viability and stability (NF)	Viability/resilience/stability of the network/ecosystem	2; 3; 4

Wealth (F)	Wealth at individual/company/societal levels, e.g. contribution to GDP; economic benefits for stakeholders	1; 2; 4
Value capture potential		**Source**
Economic financial value drivers		
Costs (F)	Cost reduction	1; 8; 9; 10; 11; 12; 13
Revenue and profit (F)	Increasing revenue and profit margins; price premium	1; 8; 9; 10; 11; 12; 13; 14
Economic non-financial value drivers		
Stock value (NF)	Higher stock price; long-term value for shareholders	1; 8; 10; 14
Competitive advantage (NF)	Strategically integrated corporate sustainability; cost leadership and differentiation; competencies	8; 9; 10; 11; 13; 14; 15
Risk management (NF)	Risk reduction, e.g. reduced risk of pollution incidents	1; 8; 9; 10; 11; 12; 16
Efficiency and quality (NF)	Increased eco-, resource or socio-efficiency (e.g. employee productivity) and product quality; better control of processes	1; 8; 10; 11; 13; 16
Market share (NF)	New markets; Larger market share	8; 11; 16
Stability and resilience (NF)	Ensured good operating conditions for the future; long-term sustainability and survival	8; 10
Reputation and brand value (NF)	Sustainability as a component of corporate reputation; increased reputation and brand value	1; 9; 10; 12; 13; 14; 15
Other business value drivers		
Customer satisfaction (SR)	Increased ability to meet (sustainability-oriented) customer expectations; perceived sustainable value	1; 10; 11; 15
Stakeholder satisfaction (SR)	Increased ability to meet (sustainability-oriented) stakeholder expectations, e.g. sustainability-oriented investors/supply chain partners	1; 9; 11; 14
Stakeholder relationships (SR)	Enhanced and open/trusted/transparent customer/ stakeholder relationships; attractiveness as partner	1; 10; 11
Attractiveness as employer (SR)	Employee motivation and satisfaction; ensured employees' commitment; attracting new/top talents	1; 8; 10; 11; 12
Innovation capabilities (H/SR)	Increased capability to innovate due to thinking in diverse dimensions	8; 9; 10; 11; 12; 14
Other value drivers		
Licence to operate (SR)	Maintaining licence to operate; social licence to operate	1; 8; 9; 10; 11
Social and environmental responsibility (H/SR)	Contributing to long-term sustainable development; increased individual satisfaction, morale and "doing the right thing" feelings	8; 9; 13; 14

Many previous studies on corporate sustainability have focused on "does it pay to be green" and have identified individual causal links between corporate sustainability activities and the economic performance of a company. However, the value capture of sustainable value creation activities is a multidimensional and complex process in which a more systemic and dynamic approach is needed. An integrative approach that can systematise and structure every unidirectional link is required – and not just individual ones (Lankoski, 2008). The link between sustainable value creation activities and a company's financial performance is a fully mediated relationship (Saeidi et al., 2015).

For example, an increased reputation and competitive advantage followed by higher customer satisfaction or employee satisfaction, innovativeness, and efficiency gains are external and internal mediators in the relationship between sustainable value creation activities and captured economic value (Saeidi et al., 2015; Schreck, 2011). Mediators help explain why it pays to be green; contingencies, i.e. moderators (e.g. the industry a company is part of, company characteristics, such as large vs small companies) help explain when it pays to be green (Dixon-Fowler et al., 2013; Schreck, 2011). An understanding of how companies create sustainable value and can benefit from these activities, requires attention to be paid to interactions among multiple stakeholders and long-term outcomes (Ortiz-de-Mandojana and Bansal, 2016; Sulkowski et al., 2018). However, what is profitable for one company or benefits one stakeholder, or increases value in one dimension of sustainability, may not be profitable for another company, or destroy value from another stakeholder's perspective or in another dimension of sustainability (Lankoski, 2008; Van Bommel, 2018; Yang et al., 2017). This further increases the complexity. We therefore suggest a multicapital approach combined with the system dynamics perspective (Abdelkafi and Täuscher, 2016), and triple bottom line and multi-stakeholder perspectives to assess sustainable value creation and value capture potential.

Key insights

As we discussed in the previous chapter, value is seen within SBMs as having multiple environmental, social, and economic value forms, and value creation is considered from the multi-stakeholder perspective and the impacts on multiple vital capital. We therefore propose that SBMs' value creation and value capture potential, assessed in multiple capital, are greater compared to more traditional business models focusing on customer value and profit maximisation.

We concretise and demonstrate the sustainable value creation and value capture potential of the SBM through the multicapital approach in a case study concerning Kekkilä Group's sustainability strategy work. Kekkilä has an ambitious goal to move from being a market-driven company to a company that is shaping the future by being part of a larger food system and solving the global food challenge. It has set six sustainability initiatives, which aim to address global food production challenges and contribute to sustainable development. We use one of these initiatives, *creating sustainable product portfolio and services*, and its three intended sustainability impacts (i.e. sustainable value propositions), *saved natural resources*, *improved wellbeing*, and *more sustainable socio-ecological systems*, as an example. Figure 2 illustrates (at a high level) how this initiative aims to create sustainable value for multiple stakeholders, i.e. users, network-level actors, and those more broadly in society, and what motivates the company to create sustainable value, i.e. what the value capture potential is. The sustainable value creation potential is expressed as multiple value forms and capital. Furthermore, the sustainable value creation potential perceived by multiple stakeholders is translated into value capture potential by the company, which is expressed as direct and indirect effects, and monetary and non-monetary value potentials.

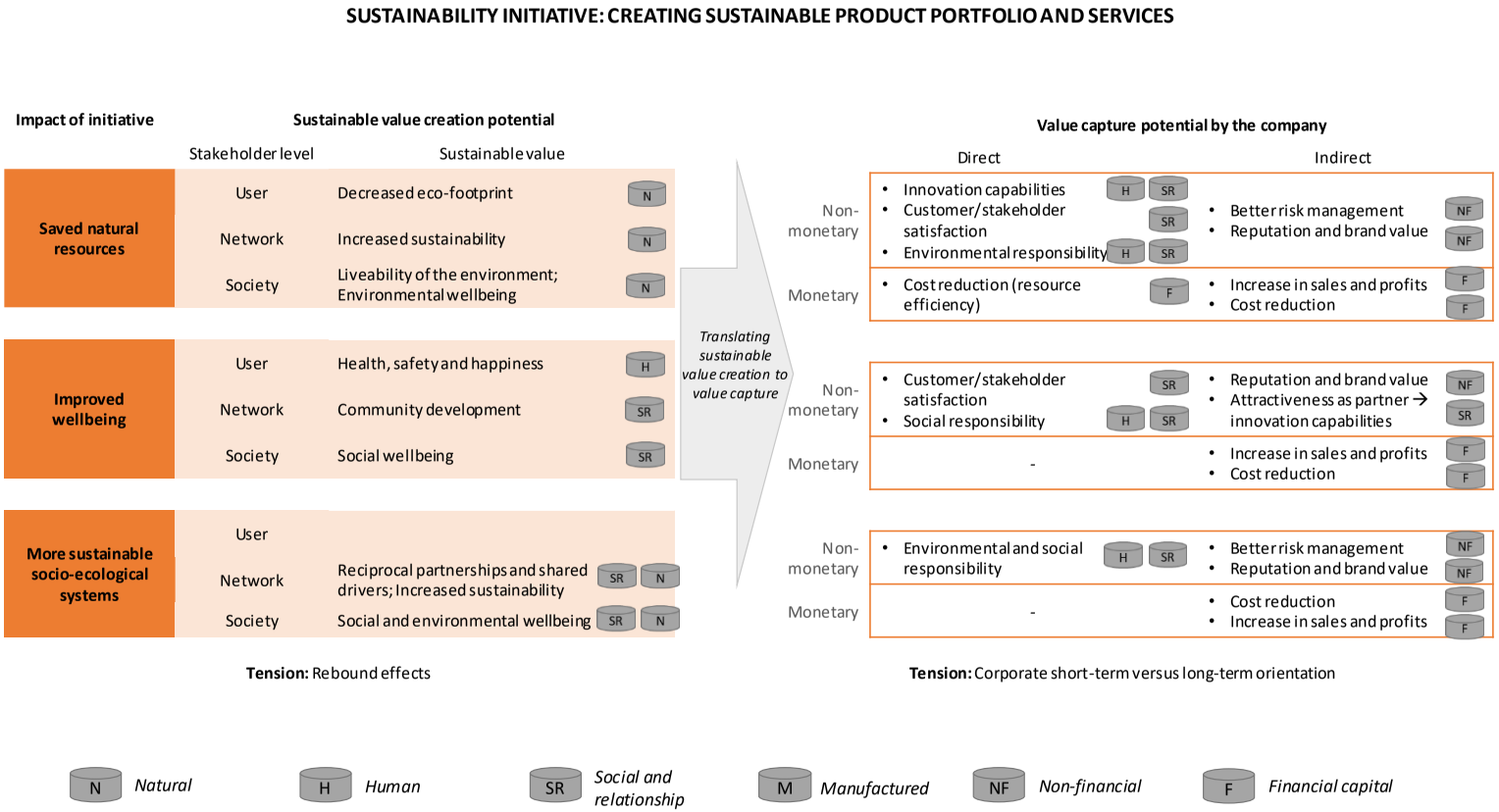

Figure 2. Multicapital perspective to sustainable value creation and value

For example, the initiative aims at *saving natural resources*. From the stakeholders' perspective, this creates environmental value, such as a smaller eco-footprint, increased sustainability, the liveability of the environment, and environmental wellbeing, and increases or protects natural capital. From the company's perspective, saving natural resources entails increased eco-effectiveness, customer or stakeholder satisfaction, and environmental responsibility. Eco-effectiveness is directly translated into financial capital through cost reduction, whereas increases in environmental responsibility and social and relationship and human capital are not directly translated into financial capital. However, an increase in environmental responsibility may lead to better risk management and further cost reduction, or an increase in brand value and a further increase in the long-term sales and profit margin.

Our analysis shows that the other intended impacts, *improved wellbeing* and *more sustainable socio-ecological systems*, are not directly translated into financial capital, reflecting the fact that they both have social welfare as the end objective (Lankoski and Smith, 2017). Profit may be only one of the end objectives. However, improved wellbeing and more sustainable socio-ecological systems increase other forms of capital that may be indirectly realised as financial capital, even if that is sometimes uncertain and not merely dependent on the company's own actions. This may lead to temporal tension, i.e. a trade-off between short-term and long-term sustainability orientation, and there is a risk of undervaluing long-term outcomes (Hahn et al., 2015).

The approach presented in Figure 2 looks quite linear and static, but it reveals that fully sustainable value creation and value capture potential demand a more dynamic approach. Figure 3 adopts the idea of virtuous circles in business models (Casadesus-Masanell and Ricart, 2011), which describes how the positive effects of implementing sustainability activity encourage an even greater increase in sustainability efforts, i.e. generating positive feedback loops. Kekkilä's decision to create a sustainable product portfolio and services has several potential consequences, relating to sustainable value creation and further value capture potential. First, adopting a sustainable product portfolio and services leads to improvements in the company's own processes, related to increased resource efficiency translated directly into cost reductions, and increased innovation capabilities translated into opportunities to decrease costs and/or increase revenues. Second, multiple stakeholders perceive new sustainable products and services as valuable, allowing the company to capture value from its value propositions. In this connection, we identified three types of virtuous circle based on different motivations to create sustainable value.

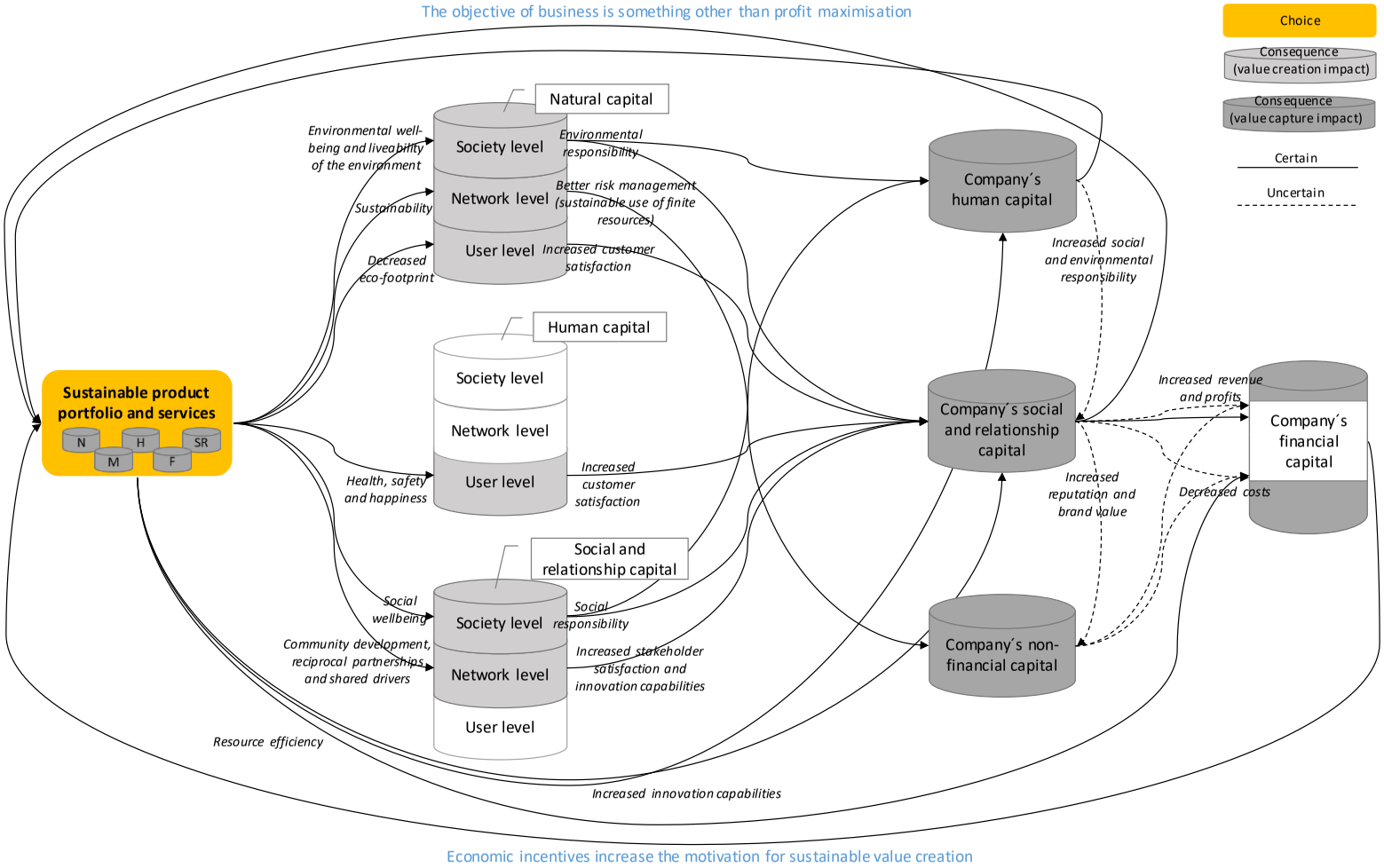

Figure 3. Potential virtuous cycles to sustainable value creation

For example, responding to customer/stakeholder demand by creating a more sustainable product portfolio and expecting increased revenues from it represents the first type, which focuses on direct economic incentives and increases in the company's financial capital. The second type covers sustainability activities derived from indirect economic incentives. For example, the use of peat, which is categorised as a fossil resource in the EU ETS, is a central part of Kekkilä's business model. A more sustainable use of peat leads to better risk management, which in turn may lead to financial gains and foster the development of an even more sustainable product portfolio. Additionally, we found commitment to social and environmental responsibility to be an intrinsic value, not a pre-identified path to cost reduction or increased revenue. For example, Kekkilä envisages the empowering of citizens, building communities, and supporting community gardening to support food security.

Discussion and conclusions

This study makes three main contributions. First, it clarifies the concepts of value creation and value capture related to the SBM by providing a more detailed categorisation of the different value forms, i.e. a summary of the sustainable value creation and value capture potential. Second, it demonstrates the sustainable value creation and value capture potential of the SBM, using the multicapital approach. It concretises sustainable value creation, in which potential impacts are indicated for certain capital. Its value form is therefore easier to identify and further translate to value capture potential. In the Kekkilä case, many of the impacts were somewhat abstract in nature, and the multicapital approach guided us to consider the value creation potential from different perspectives. Third, the study adopts the system dynamic perspective and the idea of virtuous circles in business models to identify positive feedback loops between sustainable value creation and value capture that continuously strengthen the SBM development.

From a theoretical perspective, this is an attempt to foster the development of unified definitions, and the approaches presented in this study provide the premises for a more detailed design and an analysis of the sustainable value creation and capture potential of new SBMs. From a managerial perspective, this study explains the value capture potential of sustainable value creation to foster the adoption of more SBMs. Tension, trade-offs, and conflicts in sustainable value creation are the rule rather than the exception. Hence, turning a blind eye to the value destruction perspective leads to a limited effort for sustainable development (Hahn et al., 2015). We therefore propose that further research should more closely integrate the multicapital approach with an analysis of tension.

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Publication IV

Laukkanen, M., and Patala, S.
Analysing barriers to sustainable business model innovations: Innovation systems approach

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Analysing barriers to sustainable business model innovations: Innovation systems approach

Minttu Laukkanen*

Lappeenranta University of Technology
P.O.Box 20 FI-53851 Lappeenranta Finland
E-mail: minttu.laukkanen@lut.fi

Samuli Patala

Lappeenranta University of Technology
P.O.Box 20 FI-53851 Lappeenranta Finland
E-mail: samuli.patala@lut.fi

* Corresponding author

Abstract: Business model innovations are recognised as a key to the creation of sustainable business, but their adoption by firms has been slow. Organisations can only be sustainable when the whole societal system is sustainable. Both structural and cultural changes are required to facilitate firm- and system-level sustainability. The central idea of this paper is to examine how societal transition towards sustainable business models (SBMs) can be achieved. Through a qualitative Delphi study, we assess and categorise the key structural and cultural barriers to sustainable business model innovation (SBMI). By applying the innovation system approach, we explain how to overcome existing barriers by strengthening the functions of the innovation system. We analyse how these barriers can be overcome through the activities of governments, firms and consumers, and discuss the wider implications of our research for practitioners, policy-makers and researchers.

Keywords: Barriers; business model innovation; Delphi; innovation system; institutional theory; societal change; sustainable business model; sustainable innovation

1 Introduction

Sustainable development is an increasingly important concern for business managers. If the current population and consumption trends continue, we will need the equivalent of two Earths by the 2030s (Global Footprint Network, 2014). Empirical studies have shown that CEOs see sustainability as more important than ever for long-term success, and believe that sustainability issues should be fully integrated into the strategy and operations of a company (Lacy et al., 2012). To address this, radical and systemic innovations are needed (Boons et al., 2013). Sustainable business model innovation (SBMI) is an approach for firms to re-conceptualise their purpose and value-creation logic to improve their environmental and social sustainability (Bocken et al., 2014).

Existing research on sustainable business models (SBMs) has identified several archetypes of strategies firms can pursue for SBMI, such as promoting eco-efficiency, creating value from waste, or delivering functionality rather than ownership. Although the question of how companies can transform their business models to become more sustainable is highly relevant for the society and management, it is poorly understood (Sommer, 2012), and the adoption of the strategies by firms has been slow. More research is needed on the wider social and political changes that are required to make these archetypes mainstream (Bocken et al., 2014).

The research on sustainable innovation has recently become more focused on the coevolutionary process in which technologies, social practices and institutions turn towards sustainability (Boons et al., 2013). Organisations can only be sustainable when the whole societal system is sustainable. Both structural and cultural changes are required to facilitate firm- and system-level sustainability (Stubbs & Cocklin, 2008). Business model innovation is conventionally focused on firms' internal strategic activities, but these activities are greatly affected by the institutional environment in which the firms operate (Zott & Amit, 2007). It is thus important to take a step beyond the business model of the individual firm and identify and analyse the structural and cultural driving forces and barriers which have an impact on SBMI.

This study applies institutional theory to examine the barriers to SBMI and the innovation system approach to understand the successful process of SBMI diffusion. Through a qualitative Delphi study, we assess the key barriers which have an impact on the adoption of SBMI. We then discuss how these barriers relate to the archetypes of SBMIs and how the transition towards SBMs can be promoted. By applying the innovation system approach, we explain how to remove the existing barriers by strengthening the functions of the innovation system. The main objective of this research is to examine how the societal transition towards SBMs can be achieved. Specifically, we aim to answer the following questions: What are the key structural and cultural barriers to SBMI? and How can societal change towards SBMs be promoted?

This paper is structured as follows. The theory and concepts used, such as sustainable business model innovation, institutional theory and innovation system are described in sections 2 and 3. A short overview of the research methodology is given in section 4. Sections 5 and 6 summarise the findings of our analyses. Finally, we conclude and discuss the findings and suggest possible avenues for future research.

2 Sustainable business model innovation

There is a growing interest in research connecting two young disciplines: strategic sustainability management and business model research. Business model reflects the firm`s realised strategy (Casadesus-Masanell & Ricart, 2010). It describes the rationale of how an organisation creates, delivers, and captures value (Osterwalder & Pigneur, 2010).

Business model innovation is recognised as a key to the creation of sustainable business (e.g. Boons et al., 2013; Boons & Lüdeke-Freund, 2013; Carayannis et al., 2014; Girotra & Netessine, 2013). The business model concept provides a link between an individual firm and the larger production and consumption system which it is part of (Boons et al., 2013). Business model innovations for sustainability are innovations that create significant positive or significantly reduced negative impacts for the environment and/or society, through changes in the way the organisation and its value-network create, deliver and capture value or change their value propositions (Bocken et al., 2014).

While the current literature does not offer a general conceptual definition for the SBM (Boons & Lüdeke-Freund, 2013), several important requirements have been identified. Stahel (2007) sees the SBM as a resource-miser business model, which is based on closed material loops, closed liability loops, and selling performance instead of selling products. Wu & Pagell (2011) see it as a question of how sustainable practices are adopted in internal operations and supply chain management, what the role of environmental management in their product and service value proposition is, and what is the impact of environmental initiatives on financial performance. Stubbs & Cocklin (2008) define that SBM encompasses both a systems and firm-level perspective, draws on economic, environmental and social aspects of sustainability in defining an organisation`s purpose and measuring performance, considers the needs of all stakeholders, and treats nature as a stakeholder.

A wide range of examples on specific companies, e.g. Interface Inc. and Bendigo Bank (Stubbs & Cocklin, 2008), Grameen (Yunus et al., 2010), Toyota (Porter & Derry, 2012), as well as examples of solutions and mechanisms, e.g. extended producer responsibility and end-of-life strategies (Gehin et al., 2008; Rizzi et

al., 2013), sustainable supply chain management (Linton et al., 2007; Wu & Pagell, 2011), sustainable design strategies (Niinimäki & Hassi, 2011) and base of pyramid solutions (Chaurey et al., 2012), which can contribute to business model innovation for sustainability, have been identified in the literature. Bocken et al. (2014) have introduced a more comprehensive view of how firms should approach embedding sustainability in their business models, by introducing SBM archetypes that are groupings of mechanisms and solutions that may contribute to business model innovation for sustainability. These archetypes are introduced in order to develop a common language that can be used to accelerate the development of SBMs in research and practice. We have adapted the SBM archetypes of Bocken et al. (ibid.) as follows (Table 1): The archetypes are: (1) Pollution control, (2) Maximise material and energy efficiency, (3) Create value from 'waste', (4) Substitute with renewables and natural processes, (5) Deliver functionality rather than ownership, (6) Adopt a stewardship role, (7) Encourage sufficiency, (8) Re-purpose the business for society/environment, and (9) Develop scale-up solutions. Further, the archetypes are classified in higher order groupings, which describe the main type of business model innovation: Technological, Social, and Organisational -oriented innovations (Boons and Lüdeke-Freund, 2013). Different archetypes lead to divergent sustainability benefits, and firms can use one or a selection of SBM archetypes for shaping their own transformation. Real sustainability almost certainly demands combined use of different archetypes (Bocken et al., 2014).

The first four (1–4) archetypes are technologically oriented and focused on innovation in products and manufacturing processes. Pollution control and maximising material and energy efficiency aim at eliminating emissions and optimising the use of resources. Creating value from waste aims at eliminating the whole concept of waste by turning existing waste streams into useful and valuable input to other production. This archetype seeks to both reduce waste to the minimum and create new value from what is currently perceived as waste. Substituting with renewables and natural processes addresses the resource constraints associated with non-renewable resources, and consider the potential of renewable resources and benefits from nature-inspired innovations.

The next three (5–7) archetypes are described as socially oriented innovations that focus on changing consumer behaviour and innovations in consumer offering. Delivering functionality rather than ownership is based on the literature on Product Service Systems (e.g. Beuren et al., 2013; Gaiardelli et al., 2014; Tukker, 2004), which concern reducing material consumption by offering a combination of products and services. The supply of services contains also tangible elements. From the sustainability perspective it is more important to focus on the difference between tangible and intangible or non-ecological and ecological solutions than the difference between products and services. Adopting a stewardship role aims at ensuring stakeholders' long-term health and well-being, and maximising positive social and environmental impacts through upstream and downstream stewardship. It aims at engaging the consumer with the full story of production and the supply chain. Encouraging sufficiency seeks to reduce both production and demand-side consumption by ensuring product durability and longevity, and responsible product distribution and promotion.

The last two (8–9) archetypes seek wider organisational and cultural changes in business practices. Re-purposing the business for the society/environment aims at prioritising the delivery of social and environmental benefits rather than economic profit maximisation through close integration between the firm and local communities and other stakeholders. Developing scale-up solutions aims at maximising the benefits by delivering sustainable solutions at a large scale, which means innovation in partnering, new unusual business relationships and collaborative models. (Bocken et al., 2014)

Table 1. Sustainable business model archetypes

Innovation type	*SBM archetype*	*Aim*	*Examples*
Technological	*Pollution control*	Elimination of emissions via new product innovations, cleaner production and efficient supply chains	Low carbon manufacturing; Low carbon supply chain; Low carbon solutions
	Maximise material and energy efficiency	Optimised use of resources; 'do more with fewer resources'	Lean manufacturing; Dematerialisation (of products/ packaging); Increased functionality (to reduce the total number of products required)
	Create value from waste	Elimination of the concept of waste; Reduced waste and virgin material use	End-of-life strategies (reuse, refurbish, remanufacture, recycle); Closed-loop supply chain management; Cradle-to-cradle; Industrial symbiosis
	Substitute with renewables and natural processes	Reduced use of non-renewable resources, emissions associated with burning fossil fuels, and synthetic waste to landfill	Substitute with renewable resources; Move from non-renewable to renewable energy sources; Renewables-based energy innovations; Biomimicry; Green chemistry
Social	*Deliver functionality rather than ownership*	Maximised use of products; Business focus on satisfying user needs without users having to own physical products	Product-oriented product service systems; Use-oriented product service systems; Result-oriented product service systems
	Adopt a stewardship role	Stakeholders' long-term health and well-being, and maximised positive social/ environmental impacts through upstream and downstream stewardship	Ethical trade; Fair trade; Biodiversity protection; Resource stewardship; Radical transparency about environmental/ social impacts; Consumer care
	Encourage sufficiency	Reduced production and consumption; Reduced overconsumption on systems level	Consumer/user education; Product durability and longevity; Responsible product distribution and promotion; Market places for second-hand goods; Shared ownership; Collaborative consumption
Organisational	*Re-purpose the business for society/ environment*	Prioritised delivery of social and environmental benefits (rather than economic profit maximisation)	Not for profit; Social business; Hybrid business; Base of pyramid solutions; Alternative ownership: cooperative, collectives
	Develop scale-up solutions	Maximised benefits for the society and the environment by delivering sustainable solutions at a large scale	Licensing; Franchising; Collaborative models; Co-creation; Open innovation; Crowdsourcing, Crowdfunding, Crowd co-production; Lobbying

Source: Adapted from Bocken et al., 2014

3 Innovation systems and institutional theory

The new institutional theory has emerged in recent decades as one of the dominant theories to examine the societal context of organisations (Dimaggio & Powell, 1983; Scott, 2014). The new institutionalists in sociological fields define institutions as regulative, normative and cultural-cognitive elements which provide stability to social activities (Scott, 2014). Organisations adapt to these elements to establish themselves as socially acceptable or legitimate actors (Suchmann, 1995). Legitimacy gives the actors improved access to resources, which are central for sustained competitive advantage (Oliver, 1997).

The literature on evolutionary economics also considers institutions as important aspects of the socio-technical system. Institutions are considered to be the factors and forces that hold *social technologies* or the modes of organisation and activities that are related to physical technologies, together (Nelson, 2008). While physical technologies generally play the leading role in innovation, social technologies are needed to implement them, and the two are thus highly interrelated. Changes in social technologies can be considered an integral part of business model innovation, defined as adding new activities or changing existing activities in the operations of a business (Amit & Zott, 2012). Thus, SBMI involves the development of new social technologies that advance the sustainability of a firm.

The traditional institutional theory emphasises the constraints that institutions place on the actors and consequently views their agency as limited. However, the branch of research that focuses on institutional entrepreneurship is concerned with how the actors can enact purposeful institutional change (Maguire et al., 2004). By definition, business model innovation requires change in existing systems and is driven by entrepreneurial actions, and therefore entrepreneurial actions also involve creating a favourable institutional environment for new innovations (Farla et al., 2012).

An important link to the external societal environment which facilitates the development of new technological innovations is provided by the *innovation system* -concept (Nelson & Nelson, 2002; Hekkert et al., 2007). Innovation systems can be considered as the broader institutional structures that support technological innovation, including such elements as universities, governmental funding programs and regulations (Nelson & Nelson, 2002). Several studies have attempted to dissect innovation systems in order to categorise the various activities that they include (e.g. Bergek et al., 2008; Hekkert et al., 2007). Table 2 offers an overview of these functions.

Table 2. Functions of innovation systems

Function	Example
Entrepreneurial activities	Encouraging experimentation with new technologies
Knowledge development	Pilot projects
Knowledge diffusion through networks	Workshops and conferences
Guidance of the search	Governmental R&D funding
Market formation	Forming 'nursing markets' from pilot projects
Resource mobilisation	Human capital (e.g. education), financial capital, complementary assets
Creation of legitimacy	Supportive regulations, lobbying

Sources: Hekkert et al. (2007); Bergek et al. (2008)

The actors involved in the innovation system include not only the innovating firms and their shareholders, but also their various stakeholders (Farla et al., 2012). Policymakers and public authorities can play a large role in creating a favourable regulative environment for an innovation. Consumer demands have a vital role in guiding the characteristics of an innovation. Employee values can play a role in the development of sustainable innovations, and also various civil movements and the perceptions of the wider society have an impact on decision-making for innovators.

The innovation system concept has received considerable attention in regard to societal issues, such as sustainability. The success of sustainable innovations depends to a large part on their environment, and the structure and dynamics of the innovation system (Alkemade et al., 2007). The support of an innovation system for specific technological sectors, such as renewable energy (Foxon et al., 2005, Shum & Watanabe,

2009) sustainable transport technologies (Farla et al., 2010) and sustainable water management (Ward et al., 2012) has been studied. However, the focus in these studies has been mostly on the physical technologies involved in the innovation system. As demonstrated by the archetypes of SBM, SBMI can also take the form of innovations in social technologies. There is a lack of a holistic perspective on innovation systems and SBMI.

4 Methodology

This explorative study is part of a more extensive foresight research. Our analysis is based on data from themed expert interviews and a two-round qualitative Argument Delphi (Kuusi, 1999). The aims of the Delphi study were to explore how sustainability will be integrated into firms' business models in 2030, and to identify how the transition towards SBMs will be achieved. This complex issue requires knowledge of people who understand the different economic, social, environmental and political issues in it. Because of the complexity, the Delphi method was applied in this study.

Delphi is a qualitative research method that is applied widely to a variety of problems. Delphi can be characterised as a method for structuring a group communication process so that the process is effective in allowing a group of individuals to deal with a complex problem (Linstone & Turoff, 1975). The key characteristics of a traditional Delphi study are anonymity in responses, iteration of questionnaires, controlled opinion feedback, and group statistical response (Landeta, 2006; Rowe & Wright, 1999). Traditionally, Delphi studies have aimed at reaching consensus among experts, while Policy Delphi (Turoff, 1970) studies have acknowledged also disagreement of preferable futures. The Argument Delphi (Kuusi, 1999) used in this study can be seen as variant of the Policy Delphi. Typically Delphi entails two or more survey rounds, and the procedure relies on a panel of experts. Delphi is an appropriate method to bring together a large number of qualified experts with heterogeneous backgrounds. The selection of the experts is a crucial phase of the process. The exact procedure (Okoli & Pawloski, 2004) based on the nominal group technique presented by Delbecq et al. (1975), and the matrix of expertise (Kuusi, 1999) for selecting appropriate experts, were followed.

Table 3. Delphi panel

	Political *Economical* *Social* *Technological* *Environmental* *Legal*
Business managers	CEOs and Business, Technology, Energy, Environmental and R&D Managers at large companies and SMEs
Consultants	Business consultants
Researchers	Academic researchers, Professors and Scientists in Technology, Business, Law, Corporate Responsibility and Consumer research
Government/ authorities	Ministry of the Environment, Ministry of Employment and the Economy, Ministry of Agriculture and Forestry
Non-profit organisations	Corporate Responsibility Network
Students	Bachelor, Master and Doctoral students in Technology, Business and Law

In order to prevent overlooking any important class of experts, a research team of five academic researchers first identified relevant categories of experts without identifying them by names. After careful consideration and discussions with other research groups and practitioners, the team ended in using a matrix (table 3) where each heading in the rows and columns represents a different lens for considering and identifying the experts. The experts were categorised in six groups: (1) Business managers/executives, (2) Consultants, (3) Researchers, (4) Government/authorities, (5) Non-profit organisations, and (6) Students. To achieve more variation among the panellists, their different backgrounds and expertise were ensured from the PESTEL point of view. The group of non-profit organisations was chosen because new collaborative partnerships and alliances with non-profit organisations (Dahan et al., 2010; Michelini & Fiorentino, 2012) are highlighted in building some SBM archetypes. For the time horizon, students, who are future business

executives and decision-makers, were selected. Web searches, a literature review, personal contacts and snowball sampling were used to populate the categories with actual names. The experts were selected based on their expertise in the subject matter, their capacity and willingness to participate, as well as effective communication skills. Altogether 42 experts were named to the Delphi panel. The experts came from Finland.

4.1 Survey procedure

The study was carried out during October 2012 – March 2013. Themed semi-structured interviews that took place between October and November 2012 started the study process. Eight experts representing business, academia and politics were interviewed. Each interview lasted on average 90 minutes. The objective was to shed more light on the role of business in enhancing sustainable development, the enablers and barriers of SBMI, and visions of ideal SBM in order to focus on the important issues and form interesting statements for the following online Delphi rounds, which were carried out during February 2013 – March 2013. Further, the comments of the experts in the first round served as a basis for the second round questionnaire.

The main dimensions of the questionnaires were (1) drivers and barriers to SBMI and (2) elements of SBMs. The questionnaires of both rounds contained closed and open-ended questions. The experts evaluated the statements first on a 7-point Likert scale (e.g. ranging from totally probable to totally improbable and ranging from totally desirable to totally undesirable), after which they produced written arguments. The open-ended questions allowed the experts to comment relatively freely on the SBMI. The experts were encouraged to interaction. The real-time Internet-based Delphi format allowed the possibility of having synchronic dialogue between the experts. After both rounds, the experts had the opportunity to comment on other panellists' answers, and they also had the opportunity to clarify their own comments during the process. The responses were anonymous.

4.2 Data analysis

Of the 42 experts, 40 responded to the first round Delphi inquiry, and 27 participated in the second round. The overall Delphi procedure produced a rich set of data. Written comments on the statements, as well as the former, transcribed interview data were analysed with qualitative methods. The qualitative analysis of the data was carried out by the content analysis. The main focus in the analysis was on identifying similarities and dissimilarities, and describing divergent themes and types. We proceeded in three steps. First, we identified the major barriers to the different SBM archetypes. Second, we grouped the barriers to the diffusion of the SBMs under three main categories. Third, we analysed how these barriers can be overcome by strengthening the functions of the innovation system.

5 Barriers to sustainable business model innovation

5.1 Barriers to sustainable business model archetypes

Existing research on SBMs has identified several archetypes of strategies firms can pursue for SBMI, but their adoption by firms has been slow. Several obstacles stand in the way of their diffusion. Based on the expert interviews and Delphi rounds, different barriers to technological, social and organisational -oriented SBMIs were identified (table 4), and the following observations could be made. The lack of strict legislative pressure and economic incentives were seen as the main barriers to technologically oriented SBMIs, and lack of consumer or customer acceptance and economic incentives to socially oriented SBMIs. When dealing with organisationally oriented SBMIs, attitudes and values, and larger structural barriers were emphasised.

Table 4. Barriers to sustainable business model archetypes

Innovation type	*SBM archetype*	*Main barriers*
Technological	Pollution control	• Lack of strict legislative pressure • Lack of economic incentives
	Maximise material and energy efficiency	• Lack of strict legislative pressure • Lack of economic incentives • Lack of awareness and understanding
	Create value from waste	• Lack of legislative pressure • Lack of economic incentives • Lack of awareness and understanding
	Substitute with renewables and natural processes	• Lack of clear legislative pressure • Lack of economic incentives
Social	Deliver functionality rather than ownership	• Lack of consumer/customer acceptance • Lack of economic incentives
	Adopt a stewardship role	• Lack of consumer/customer acceptance • Short-term profit maximisation • Lack of transparency (challenging supply chain control in global environment)
	Encourage sufficiency	• Lack of consumer/customer acceptance • Lack of economic incentives • Lack of legislative pressure • Lack of international agreement (e.g. substitutes from Asia)
Organisational	Re-purpose the business for society/ environment	• Attitudes and values • Lack of awareness and understanding • Lack of incentives/support • Short-term profit maximisation • Structural barriers
	Develop scale-up solutions	• Attitudes and values • Lack of awareness and understanding

Technologically oriented sustainable innovations related to pollution control, resource efficiency and renewable-based business are quite well supported by regulation mechanisms. However, the world is currently using the equivalent of 1.5 planets to support human activities. The experts in this study thought that stricter legislative pressure and supportive economic incentives would be needed to achieve sustainable economy. Radical resource scarcities will lead to remarkably increased prices and further resource efficiency because of its cost-effectiveness. However, resource scarcity is a relative concept. It is easier to use resources today than predict resource scarcity in the future. Without strict price control for resource usage and significant waste charges, the real value of raw materials and waste will not be noticed. The lack of economic incentives for cleaner production methods, technologies and solutions, and lack of sanctions and prohibitions for unsustainable ones are noted. Low carbon and renewables -based solutions are high-priced, and incentives that motivate to choose cleaner technology in all circumstances are not encouraging enough. In addition to regulatory barriers, the lack of awareness and understanding is emphasised. The broad perspective over the whole value network is missing. Resource efficiency and creating value from waste require new partnerships across industries and new business models.

Sustainable technologies hold the promise of reducing harmful emissions and using resources more efficiently, which is important in dealing with environmental challenges. The experts pointed out that it is not clear that consumer habits will change towards sustainability through new technologies. Efficiency in material and energy use generates rebound effects. The driver who replaces his car with a fuel-efficient model, only to take advantage of its cheaper running costs to drive further and more often is an example of a rebound effect (Sorrel, 2007). Hence, social and organisational -oriented SBM innovations that focus on changing consumer behaviour and seek wider organisational and cultural changes in business practices are crucial.

While the lack of legislative pressure was emphasised with technologically oriented innovations, lack of consumer or customer acceptance was seen as the main barrier to socially oriented SBM innovations. The experts did not see socially oriented innovations as dominant today. Consumer habits are handed down from generation to generation and the youth of today will also supply material need. Consumers or customers appreciate a cheap price rather than sustainability aspects, and firms answer these calls. We have created a "disposable" culture where it is more profitable to produce or buy cheap and short-lived products than offer or buy e.g. more sustainable repair services. The public sector supports private ownership and free consumption. Many industries are based on extremely fast cycles of fashion, and firms focus on short-term profit maximisation. Radical changes in consumer preferences are needed, but there is still call for cheap products. Thus regulation that offers cost-benefits for customers, and does not encourage overconsumption is needed.

Attitudes and values, as well as common understanding were seen as the major barriers to the diffusion of organisationally oriented SBM innovations. Business aims at maximising economic profit and short-term financial gain, not focusing on long-term strategic planning. Profitability indicators do not support prioritised delivery of social and environmental benefits. Different forms of business, e.g. social businesses, cooperatives and collectives are not supported by regulatory bodies. In order to SBMs become common at a large scale, structural changes in legislation and economy are needed.

5.2 Barriers to the diffusion of SBMs

Overall, the above-mentioned key barriers to the diffusion of SBMs can be structured by the following three categories: (1) Regulatory, (2) Market and financial and (3) Behavioural and social (table 5). It is notable that the diffusion of SBMs was not seen as a technologically focused issue. The experts thought that the technologies (such as Internet, 3D technology, renewables-based energy innovations) of today make sustainable business entirely possible. It is not a question of new technologies; it is more like a question of attitudes and values and regulation mechanisms. The crowd does not see sustainability attributes as dominant. Consumers appreciate good products and services at an affordable price, and they do not see environmental and social problems until in the middle of a crisis. Firms comply with regulation, but they do not take steps beyond it voluntarily.

Particularly the responsibility of regulatory bodies was emphasised in all discussions. As mentioned above, the experts in this study demanded stricter legislative pressure and supportive economic incentives. They underlined the importance of regulatory and financial mechanisms that would lead to the introduction of new technological innovations, but also guide to using old technologies in a sustainable manner. However, regulation is extremely challenging. Lack of long-term regulatory frameworks will lead to uncertainty and short-term investments, but politicians' time frame differs from that of firms. Too loose regulation does not motivate, but too strict regulation at the early phase of development discourages the development of rival innovations. Lack of stakeholders' involvement in the decision making process will lead to inconsistent and overlapping regulation mechanisms, and also to opposition of regulation.

From the market perspective, a distinct lack of awareness and understanding of SBMs among firms, financiers and consumers can serve in limiting both supply and demand. Firms (particularly small and medium enterprises) do not have adequate understanding, and market participants cannot identify the

partnerships that are needed for developing sustainable business. Firms do not master sustainable marketing, and customers do not know how to make sustainable choices. Many firms are financially successful in their current form and in the current environment, and they may be unwilling to change as they have a vested interest in maintaining the status quo. The enterprise culture does not support sustainable business fully, and financial risks lower the motivation. Holistic change is required to deal with the challenges. The diffusion of SBMs requires collaboration and involvement both at society and individual level. Changes in consumer habits and legislation, as well as new business models are prerequisites for a more sustainable society.

Table 5. Barriers to the diffusion of SBMIs

Regulatory barriers	*Market and financial barriers*	*Behavioural and social barriers*
• Lack of long-term strict legal regulatory frameworks • Inconsistent and overlapping regulatory mechanisms • Lack of economic incentives • Lack of encouragement to innovativeness • Lack of flexibility • Lack of involvement of stakeholders in decision making • Lack of normative rules/industrial standards	• Financial risk • Short-termism • Lack of awareness and understanding among market participants • Lack of marketing know-how	• Attitudes and values • Lack of consumer/ customer acceptance • Lack of risk-taking • Enterprise culture • Leadership, management • Lack of motivation • No stakeholder pressure • Profitability of existing business models/ satisfaction

6 Transition towards sustainable business model innovations

To understand the successful diffusion of SBMs, we will next examine the technological innovation system functions in relation to the barriers to SBMI (table 6). We will explain how the different functions can act to remove or decrease the identified regulatory, market and financial, and behavioural and social barriers to SBMI.

Table 6. Functions of innovation system for overcoming barriers

Barriers / ***Functions***	***Regulatory***	***Market and financial***	***Behavioural and social***
Entrepreneurial activities	Long-term legal frameworks; Various encouraging regulative mechanisms	Collaboration	Adventurism; Visionary executives and game changers
Knowledge development	Understanding of practical regulative mechanisms	New partnerships; New indicators	Education
Knowledge diffusion through networks	Stakeholders involvement; Industrial norms	Communication; Guidelines and instructions	Education

Guidance of the search	Structural changes in legislation and economy; Long-term legal support	Incentives	Enterprise culture
Market formation	Stricter regulation; Specialised policy instruments	Incentives	Eco-labels; Eco-indicators
Resources mobilisation	Fair support for different technologies	Collaboration; Ethical investments	
Creation of legitimacy	Lobbying	Informing; Transparency	Media attention

6.1 Entrepreneurial activities

Entrepreneurs, incumbents as well as new entrants, have a vital role in the development of new SBMs. Visionary executives who are willing to change and challenge the status quo are needed to overcome the behavioural and social barriers to SBMI. Entrepreneurs should also be encouraged to collaborate and form partnerships with various stakeholders that have an interest in their activities. Such collaboration can be promoted by forming platforms and coalitions around key sustainable development issues, which can act as a catalyst for new innovations. Policy-makers also need to support the entrepreneurs with regulations that encourage potentially risky experimentation and pilot projects.

6.2 Knowledge development

Knowledge development is a vital function for advancing the understanding of sustainable business. For policy-makers it is vital to understand the exact impacts of regulative mechanisms on firms' activities. Firms need to be able to understand the meaning of sustainable value and its relation to sustained competitive advantage. This can be accomplished by increasing the understanding of the positive connections between corporate environmental performance and financial performance. For example, increased understanding is needed on the financial impacts of environmental problems, such as global warming. This understanding will help form new indicators for profitability that are more suited for sustainable development. Universities and research centres have an important role in advancing the knowledge on sustainability, as well as diffusing this knowledge through educational activities.

6.3 Knowledge diffusion through networks

In addition to developing new knowledge, an important function of innovation systems is the diffusion of knowledge through relevant networks of actors in the system. In terms of removing the regulatory barriers of SBMI, political decision-making should aim at involving relevant stakeholders in decision-making and the preparation of policy instruments. Cooperation between governmental organisations and businesses can promote the formation of voluntary industrial norms in addition to regulations. The market and financial barriers can be addressed by sustainability-oriented communication in the innovation system. For example, the development of guidelines for sustainability reporting can diffuse knowledge of sustainability issues between businesses and their stakeholders. Eco-labelling practices can make sustainable buying behavior easier for consumers. The behavioural and social barriers can be lowered by improving education on sustainability, which can increase both consumer and producer acceptance of SBMs.

6.4 Guidance of the search

Innovation systems must also be able to focus the limited resources available. Guidance of the search can be provided by governmental interventions, for example by forming regulative frameworks that aim at long-term sustainable change (Hekkert et al., 2007). Examples of these types of regulations are for example reduction targets for carbon emissions or market-share targets for renewable energy production. These

forms of regulations can act as catalysts for innovations in these sectors. Overlapping and inconsistency in regulations should be addressed to provide clearer goals for innovation activities. In regard to market and financial barriers, governments can also provide financial incentives, such as tax cuts for sustainable technologies or deterrents, such as emission taxes that guide entrepreneurial activities through market mechanisms.

6.5 Market formation

The fifth key function of innovation systems is forming markets for new technologies. As new technologies often have initial difficulties to compete with incumbent technologies, governments can create temporary niche markets to aid their commercialisation. Favourable regulations, sustainability standards and tax incentives can all promote this. The market and financial barriers can be decreased by promoting a functional local home market, an important catalyst for commercialisation. Governments should ensure that the home markets for new SBMs are functioning to provide a test market for firms before their technologies reach the mass market phase. Consumer acceptance can be advanced by improving the price competitiveness of sustainable products and services compared to unsustainable ones, as high prices are often a barrier for the mass-market appeal of sustainable products. Public procurement practices can also support the adoption of SBMIs.

6.6 Resource mobilisation

New innovations also require resources, human and financial, to take off. Governments can design R&D programs that channel resources towards specific innovations. In terms of overcoming the barriers to SBMI, the programs should aim at supporting a diverse range of new technologies and innovations, such as biofuels, electric cars, and fuel cells in the case of sustainable transportation. This ensures a range of options for moving to SBMs. The market and financial barriers can be overcome by forming collaborative alliances and coalitions, and increasing the amount of available resources for specific innovations.

6.7 Creation of legitimacy

Last, a vital function of innovation systems is to create legitimacy for the focal innovations, as incumbent technologies and parties with vested interests often cause resistance to change (Hekkert et al., 2007). The innovators for SBMI need to form new associations and use positive lobbying for policy-makers to gain resources and a more favourable environment for new technologies. Dissemination of success cases and stories among business actors is important for overcoming the market and financial barriers, to create awareness of the possibilities for SBMIs that are also profitable. Behavioural and social barriers can be overcome by promoting the awareness of environmental/social problems in the media, as well as success stories of solutions to those problems.

7 Discussion and conclusion

In this research, we studied the barriers to the diffusion of SBMIs. We examined the existing theoretical frameworks for SBMI and highlighted the archetypes of SBMI focused on technological, organisational and social innovations. Through a qualitative Delphi study consisting of a panel of 42 experts, we identified several important barriers to SBMIs. These focused on three primary areas: *regulatory, market and financial* and *behavioural and social* barriers. Lastly, we applied the functions of innovation systems - framework (Hekkert et al., 2007) to analyse how these barriers can be overcome through the activities of governments, firms and consumers. We will next discuss the wider implications of our research for practitioners, policy-makers and researchers.

Firstly, our research highlights the importance of well-functioning regulatory frameworks for SBMIs. Mechanisms such as emission regulations, taxes and subsidies can aid the commercialisation of new

innovations. Regulations should not be formed around short-term political interests, but on long-term societal trajectories for sustainable innovations. Policy-makers should also avoid forming several overlapping, or even inconsistent regulatory frameworks. At the same time, regulations should also support a diverse set of alternate sustainable innovations, as multiple viable solutions can increase sustainable development.

Secondly, the role of voluntary business activities is also vital for the diffusion of SBMIs. As businesses are mostly driven by economic concerns, they will most likely focus on adopting SBMs that provide win-win situations (Escobar & Vredenburg, 2011). At the same time, visionary entrepreneurs are needed to adopt radical new innovations, and the environment of the innovation system should support this. Businesses need to collaborate with their stakeholders in sustainability issues, and also with each other to form common norms that support SBMI. In addition, sustainability reports and eco-labels are needed to allow consumers to make sustainable buying decisions.

Our study contributes to the research on innovation systems and societal change by giving an example of how the functions of innovation systems -framework can also be applied with a broader view on sustainable business model innovations, and not just focused on specific sustainable technologies. This broader view can uncover possible conflicts and overlapping regulations in regard to how the different functions support sustainable innovations. It also aids in recognising synergies between activities that support the various kinds of SBMI, which can help in developing innovation systems with a wider impact. Conversely, this wider view can also lack details related to specific kinds of innovations. Therefore we suggest that future research could utilise a mid-level approach and focus on specific archetypes of SBMI.

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Sustainable system value creation: Development of preliminary frameworks for a business model change within a systemic transition process

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TITLE

Sustainable system value creation: Development of preliminary frameworks for a business model change within a systemic transition process

AUTHORS

Katariina Koistinen[1], Minttu Laukkanen[1], Mirja Mikkilä[1], Janne Huiskonen[1] and Lassi Linnanen[1]
[1] Lappeenranta University of Technology, POBox20, FI-53851 Lappeenranta, Finland

ABSTRACT

Although corporate sustainability has gained more attention and companies have recently showed a growing interest in sustainable practices, the progress towards sustainable development has been slow leading to increasing environmental and social challenges. Business model innovations are recognized as a key to the creation of sustainable business and as a bridge between company level and system level changes. Sustainable business model innovations create, deliver and capture economic, social, and ecological value for customers and other stakeholders in various societies.

The aim of this article is to deepen the understanding of the ways how companies create and capture sustainable value through business models in a larger operation system. From the theoretical perspective, the article adopts the transition theory and the concept of strong sustainability for understanding socio-technical transitions and business model changes towards sustainability. Here the focus is on companies' dualistic role pursuing sustainable development targets – both contributing to sustainability within the business dimensions, and assisting the broader systemic change through the new sustainable business models. Furthermore, the article deals with the external factors that either enable or hinder companies to transform their existing business models towards sustainability.

By reviewing previous literature, this study develops preliminary frameworks combining the approaches of transition management, sustainable value creation and corporate sustainability levels. The work aims to decrease the existing gap between the literature of system transition and business models. The frameworks can be applied in the future in analyzing new sustainable business models, value processes, value creation and capture, and broader systemic changes towards sustainability.

INTRODUCTION

The number of publications on corporate sustainability has increased exponentially since the early 1990s (Linnenluecke & Griffiths, 2013), and companies overall are showing increasing interest towards corporate sustainability practices (e.g. Lacy et al., 2012). However, the progress towards sustainable development has been slow, and ecological and social problems are increasing. Dyllick and Muff (2015) identified a significant disconnection between the organizational, micro-level concepts of corporate sustainability and sustainable business and the global, macro-level concept of sustainable development. Company-level actions contribute marginally to global sustainability if corporate sustainability and sustainable development are disconnected, and consequently, the performance measures remain disconnected. Three conceptual challenges disconnecting the concepts of corporate sustainability and sustainable development were addressed: 1) the poor integration of all three dimensions (economic, ecological and social) in the business sustainability discourse, 2) the insufficient integration of the societal macro level with the organizational micro level, and 3) the focus on economic success as the dominating performance measure.

The concept of the business model is presented as a bridge between changes at the company level, micro level, and the system level, macro level (Boons & Lüdeke-Freund, 2013; Boons et al., 2013). Monumental challenges, such as climate change, resource depletion and inequality, question the traditional manner in which companies create value. Innovations promoting the sustainable performance of companies are more crucial than ever for long-term success, and sustainability issues should be fully integrated into the strategy and operations of a company (Lacy et al., 2012). Sustainable business model is an approach for firms to reconceptualize their purpose and value creation logic to improve their economic, environmental and social sustainability (Bocken et al., 2014)., and sustainability can be seen as a central driver of innovation (Nidumolu et al., 2009). Although the question of how companies can transform their business models towards sustainability is highly relevant for society and management, and sustainable business model literature is evolving, companies have been slow to adopt sustainability strategies and sustainable business models. Sustainability transitions are complex and unique because sustainability is a collective good, which means that most sustainable solutions do not offer direct user benefits (Geels, 2011). It is therefore unlikely that sustainable business model will be able to replace existing systems without wider system level changes, such as changes in regulatory frameworks and industry level policies.

Firms are capable of contributing to sustainability through multiple transition pathways (Geels & Schot, 2007; Geels, 2014) when firms can be interpreted as agents of sustainability transitions. Transition literature typically perceives business enterprises as external agents that challenge the status quo, whereas the internal processes of firms are often underplayed. The processes of value creation and capture within business environments are needed to understand both business model change and system transition.

In addition, business models are typically considered from the viewpoint of a focal company, and to date, business model research has predominantly focused on company level analyses and examples, whereas sustainability often requires a broader, system level perspective (Abdelkafi & Täuscher, 2016; Gorissen et al., 2016; Pedersen et al., 2016). Internal activities through which companies enhance sustainable business are greatly affected by the business environment in which the companies operate (Zott & Amit, 2007). It is thus important to take a step beyond the business model of the individual company and identify and analyze driving forces and barriers that have an impact on sustainable business models. A deeper understanding is required on the mechanisms on how the business model concept can bridge corporate sustainability and system level innovation. System level change and industry transformation require the joint efforts of several actors and the change of more than one company's business model.

This study contributes to these calls by applying transition theory to explain both the business model change at the company level and wider socio-technical transition towards sustainability. Transitions emerge through agency that can be, for example, an individual, a business enterprise, or a governmental or non-governmental organization. The article aims at explaining the mechanisms of sustainable value capture and creation at the company level but within a larger operating system.

This paper is organized into two main sections and conclusions. The next section reviews the literature from different disciplines and presents the central concepts of the study and the theoretical background related to them. The following section integrates the disciplines and ends up presenting preliminary frameworks emerging from the relevant theories. The initial integration of different disciplines may help to reduce the gap between system transition literature and business model literature. The final section draws conclusions and presents implications and avenues for future research. Since the focus of this chapter is theoretical, the proposed future research directions include testing the frameworks empirically.

THEORETICAL AND METHODOLOGICAL BACKGROUND

Previous literature was reviewed in order to create the basis on understanding socio-technical transitions and business model change towards sustainability. The qualitative literature analysis (see e.g. Marshall and Rossmand, 1999, Miles and Huberman, 1994) was conducted in two iterative stages. First, we identified the main concepts and conducted the literature review. Second, we used constructive research to synthesize the findings from the previous literature and to develop the integrative frameworks. We used the Scopus database and the following keywords and their combinations to find relevant articles: ‘business model’, ‘sustainability’, ‘transition management’, ‘system transition’ and ‘systemic change’. (Scopus is an extensive database and probably the best tool available for literature searches, particularly for articles published after 1995 (Falagas et al., 2008). Falagas, M.E., Pitsouni, E.I., Malietzis, G.A. & Pappas, G., 2008, "Comparison

of PubMed, Scopus, Web of Science, and Google Scholar: Strengths and weaknesses", *FASEB Journal*, vol. 22, no. 2, pp. 338-342.)

Based on three key concepts identified – namely, sustainability, business model and system transition – the conceptual framework was outlined for integrating business model change and system transition towards sustainability (Figure 1). The key concepts are discussed in this section. The synergy between the disciplines is created based on the findings of the discussion in the following section.

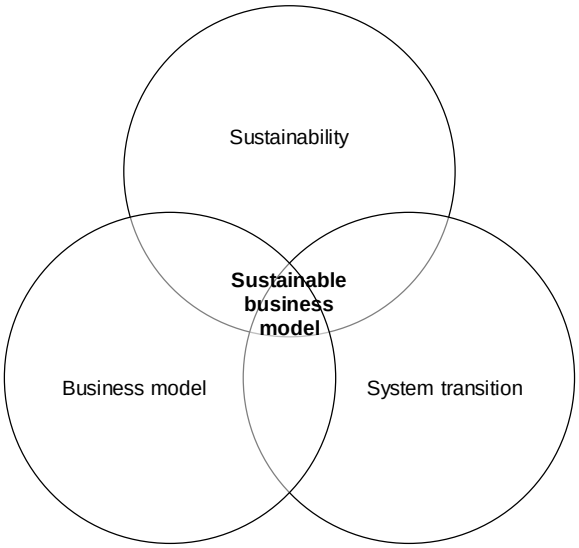

Figure 3. Conceptual framework for sustainable value creation

Concept 1: Sustainability

Planetary boundaries

Since the world faces mounting sustainability threats and great challenges, researchers have attempted to determine sustainable limits to human activities. After the Industrial Revolution, human actions have been the main drivers of global environmental change, hence pushing the Earth outside of its stable environmental state with consequences that are detrimental or even catastrophic for large parts of the world. Rockström et al. (2009) have developed “planetary boundaries” that define the safe operating space for humanity with respect to the Earth’s system and are identified in terms of the planet’s biophysical subsystems or processes. Steffen et al. (2015) addressed the impact of accelerating economic growth and equity for the changing safe operating space. Milne et al. (2006) emphasized management approaches to corporate responsibility in this context. The debate has led to investigating on the contribution of companies to the degradation of the nine specific boundary processes on different focal scales (Whiteman et al. 2013).

Sustainability

WCED (1987) defined sustainability as the development meeting the present needs without compromising the ability of future generations to meet their own needs. Within this view, pursuing sustainability is seen as a process of gradually conjoining demands on and the supply of resources, the infinite and finite aspects of human life (Williams & Millington, 2004). Traditionally, sustainable development is portrayed as a convergence, or a triple bottom line, of three different pillars: economic, ecological and social (e.g. Mikkilä, 2006, Mikkilä et al., 2015).

The debate by scholars and practitioners culminated into the categories of weak sustainability and strong sustainability. The distinction between weak and strong sustainability was derived from the attempts to operationalize sustainability in a purposeful way. Weak sustainability refers commonly to a need to expand the stock of resources by, for example, developing renewable resources, making more out of existing resources or finding technological solutions to environmental problems (Williams & Millington, 2004). The idea underlying strong sustainability is to revise the demands on the Earth. For instance, the consumption should be decreased, rather than adapting the Earth to suit human needs (Williams & Millington 2004). The distinction between weak and strong is, however, rather crude and the reality much more diverse.

Sustainable development related to corporate sustainability

The idea of sustainable development is often dominated by the macro level. Baumgartner and Ebner (2010) argued that sustainable development is designated only at the macro level of societies. Comprehensive corporate sustainability strategy eventually have positive effects on societies at large. This micro level sustainability refers commonly to corporate sustainability or responsibility including the three dimensions of economic, environmental and social sustainability (Mikkilä, 2006; Mikkilä et al., 2015) Corporate sustainability is a value-bound concept that varies in place and time depending on the surrounding, dominating regime. Corporate sustainability and responsibility refer commonly to the operation environment: natural resource based industries favor corporate sustainability, whereas several other sectors apply corporate responsibility (Mikkilä & Toppinen, 2008; Mikkilä et al., 2016).

The research on how corporations can contribute to sustainability has continued over the past decade and, for example, Dyllick and Muff (2015) have introduced a four-level typology for corporate sustainability in order to clarify when business is truly sustainable. These levels are “business-as-usual”, “refined shareholder value management”, “managing for the triple bottom line” and “truly sustainable business”. The first focuses on producing economic value in the form of profit and shareholder value, and externalized costs are not understood or measured. At the second level, the business objective is to create shareholder value, but environmental and social concerns are considered in decision-making and actions as economic risks but also opportunities for business. At the third level, value creation goes beyond shareholder value, including social and environmental values. This means a broadened stakeholder perspective, pursuing a triple

bottom line approach, and creating sustainable value not just as a side-effect of business activities but as the result of deliberately defined goals. The highest level, truly sustainable business, shifts the perspective from the traditional "inside-out" approach to "outside-in", referring to the creation of a significant positive impact in critical and relevant areas for society and the planet in addition to the mitigation of negative impacts. Sustainability challenges are turned into business opportunities making "business sense" of environmental and social issues.

Concept 2: Business model

Business model innovation

A business model describes the rationale on value creation, delivery and capture of organizations (Osterwalder & Pigneur, 2010). It reflects the company's realized strategy (Casadesus-Masanell & Ricart, 2010), emphasizes a holistic approach to explaining how companies "do business" (Zott et al., 2011) and provides a link between an individual company and the larger production and consumption system (Boons et al., 2013). The business model describes *how* and to *whom to do business in addition to what* a business does (Zott & Amit, 2010).

Business model innovation is widely acknowledged as a source of innovation (Zott & Amit, 2007; Amit & Zott, 2012) and as a key source of competitive advantage (Baden-Fuller & Morgan, 2010; Chesbrough & Rosenbloom, 2002; Teece, 2010). It is also recognized as key to the creation of sustainable business (e.g. Boons et al., 2013; Boons & Lüdeke-Freund, 2013; Carayannis et al., 2014) and the enhancement of the transition towards a circular economy (e.g. Lewandowski, 2016; Planing, 2015). Comprehensive sustainability efforts are more likely to take place in organizations that demonstrate high levels of business model innovation (Pedersen et al., 2016).

Business model for sustainability

Business models for sustainability, i.e. sustainable business models, significantly increase positive impacts or reduce negative ones for societies by changing value creation, delivery and capture by organizations and their networks (Bocken et al., 2014). According to Schaltegger et al. (2012; 2016), sustainable business modeling aims at identifying opportunities that allow firms to capture economic value whilst generating environmental and social value, thereby establishing the business case for sustainability. A business model that contributes to sustainable development needs to create value to the whole range of stakeholders and the natural environment, beyond customers and shareholders (Schaltegger et al., 2016). Upward and Jones (2016) have presented a more theoretical approach; they discuss weak and strong sustainability and compare more profit-oriented business models to strongly sustainable business models building on the natural and social science of sustainability. They see that strongly sustainable business models do no harm but create positive environmental, social, and economic value throughout the value networks, thereby sustaining the possibility that human and other life can flourish on this planet forever. Strongly sustainable business models take financial, societal and

environmental costs into account and measure financial rewards, social benefits and environmental regeneration – so called tri-profit.

Stubbs and Cocklin (2008) defined a sustainable business model to draw economic, environmental and social aspects of sustainability in defining a company's purpose and measuring its performance, considers the needs of all stakeholders, treats nature as a stakeholder, and encompasses both a system and a company-level perspective. Abdelkafi and Täuscher (2016) emphasized the system-level perspective by conceptualizing a sustainable business model, that enables the company to reinforce the mutual interdependencies between the value created for its customers and the environment as well as the value captured for itself. The more value the company can create for its customers and the wider environment, the higher the value it captures for itself.

The literature has identified a wide range of examples on specific companies aiming at contributing to business model innovation for sustainability, for example Interface Inc. and Bendigo Bank (Stubbs & Cocklin, 2008), and British Sugar (Short et al., 2014). Some examples show solutions and mechanisms of extended producer responsibility and end-of-life strategies (Rizzi et al., 2013), product-service systems (Tukker, 2015), base of pyramid solutions (Chaurey et al., 2012), and collaborative consumption (Bardhi & Eckhardt, 2012)..

Business model change towards sustainability

Business model innovation covers changes from incremental adjustments to more radical and systemic changes (Cavalcante et al., 2011). The innovations required for sustainable development need to move beyond incremental adjustments (Johnson & Suskewicz, 2009; Boons et al., 2013). Gauthier & Gilomen (2016) proposed a four-stage typology of the business model transformations where the first two stages represent business as usual or incremental innovation and marginal modifications to business model elements without major changes to the whole value delivery system, and the latter two more radical innovation. These four stages are: "business model as usual", "business model adjustment", "business model innovation", and "business model redesign". Business model innovation refers to major business model transformations and the strong potential of new value propositions and value creation mechanisms, and business model redesign refers to a complete rethinking of companies' business model elements to bring radically new value propositions to the market. From the sustainability perspective, the first stage could mean pollution prevention, cleaner production and good working conditions within legal and other external standards, whereas designing products for sustainability, resource efficiency and sustainable marketing and communication with stakeholders are covered at the second stage. The third stage highlights designing whole processes for sustainability. At the highest, the fourth level, companies see sustainability as a real business opportunity and source of differentiation. Companies translate sustainability challenges into business opportunities by making "business sense" of societal and environmental issues (Dyllick & Muff, 2015). Shifting from traditional energy business

to solar energy-based solutions business represents an example of a sustainability based business.

Concept 3: System transition

System transition and multi-level perspective (MLP)

Previously, the literature on environmental innovation was dominated by single technologies, such as developing wind turbines or biofuels. The multi-level perspective brings together both technological and social approaches to system transition, hence being one of the leading theories regarding sustainability transitions in the socio-technological system (Geels, 2011). MLP explains trajectories of sustainability transitions. Emerging sustainability innovations challenge and aim at replacing the existing, typically unsustainable system (Geels & Schot, 2007; Geels, 2011). MLP is based on the assumption of the three-level structure: niche level, regime level and landscape level. Technological trajectories locate in the socio-technical landscape, consisting of a set of deep structural trends, such as economic growth or oil price (Geels, 2002).

The landscape is described as an external structure or context for interactions of actors. Regimes refer to rules that enable and constrain activities within communities, whereas the landscape refers to wider technology-external factors. (Geels, 2002) The landscape is constantly transforming, but relatively slowly compared to regimes. Regimes generate incremental innovations, whereas radical innovations are generated in niches (Geels, 2002).

Genus and Coles (2008) and Berkhout et al. (2005) criticized the definition of transitions being problematic overall, being challenging to specify the start and end of transitions. Markard and Truffer (2008) argued that the definition of a regime is incoherent in MLP and regimes can bedefined at different levels of combination and from different perspectives. Moreover, MLP has steadily discussed policies as steering methods within the framework, but the policy is often an external force that is not actually implemented in the socio-technical transition (Smith et al. 2010). One of the critiques against MLP considers agency and how it isunderplayed in the framework. Sometimes MLP falls to focus on the technological transition rather than agency that has the capability to transform the existing regime (Smith et al., 2005; Genus & Coles, 2008).

Agency and MLP

Agents are capable of creating and advancing sustainability transitions and sustainable value. Agency is understood here as the capacity of performing acts that contribute to sustainability. The representations of agency can appear as both individuals and larger groups, such as firms pursuing sustainability. Several scholars recognize that agency plays a crucial role in sustainable transitions as a part of MLP. For example, Grin et al. (2011) and King (2008) suggested that agency creates change, having a necessary role during particular episodes of a transition. Agency typically possesses abilities, means, and power for deliberative action on multiple scales to contribute to sustainability (Wiek

et al., 2012). Agency also deeply influences the internal translation and interpretation of sustainability and helps to embed it further (Lehner, 2014; Heijden, van der Cramer & Driessen, 2012).

Agency shaping the system

The power of agency lies in its potential to shape the prevailing regime. Most pioneering studies suggested that agency could be the most effective element in creating lasting transition for better future (Walker et al., 2010; Fudge, Peters & Woodman, 2016). MLP framework recognizes the agents to be capable to introduce transitions outside the prevailing regime, and discursive activities at regime and niche levels eventually result in cultural repertoires at the landscape level (Geels & Schot, 2007; Geels & Verhees, 2011; Geels, 2011). The ability of achieving a more sustainable system ultimately depends on agency, which drives niche innovations and implements regime changes or connects niches and regimes (Grin, Rotmans & Schot, 2011).

Agents shape the prevailing system by challenging the current regime. To challenge the prevailing regime, niche innovations have to achieve legitimacy, which is required for an innovation to initially become relevant and in the end dominant in the system (Bork et al. 2015; Haxeltine & Seyfang, 2009). Legitimacy is achieved by surpassing resistance to change. Resistance from the current regime is likely since agents ultimately challenge the existing system. The current regime also embodies power: the rules, resources and actor configurations which are part of the regime will privilege particular practices over others (Grin, Rotmans & Schot, 2011). Whereas the incumbent regime uses its power to create resistance towards transition, it is also true that regime changes eventually result in changes in power relations (Grin, Rotmans & Schot, 2011). The challenge for regime shaping agents lies in making transition dynamics and the political dynamics associated with it to reinforce each other generously to gradually destabilize the harmony of power and legitimacy between incumbent and sustainable practices, which consequently may lead to merging through common visions or through the graduate, self-reinforcing structuring of practices (Grin, Rotmans & Schot, 2011).

From multi-level perspective (MLP) to triple embeddedness framework (TEF)

MLP has dominated the related sustainability transition theories even though it has been rather policy oriented and paid marginal attention to the business environment. To address this gap, Geels (2014) developed a new conceptual framework, the triple embeddedness framework (TEF) acknowledging interactions between incumbent business firms and operation environments. The interactions between business industries and their economic and socio-political environments were conceptualized as bi-directional.

The major global challenges, such as climate change, energy security, transport and resource efficiency, and food safety, are results of negative externalities for incumbent firms in industries, such as, oil or coal (Geels, 2014). These typically unsustainable systems are rigid and filled with various lock-in mechanisms (Geels, 2011). A stable incumbent regime is the outcome of various lock-in processes and it reinforces itself as

conflicting to novel innovations (Klitkou et al. 2015). In addition, incumbent firms typically embody power and internal resources and incumbents use their adaptive capacity to orient emerging transition trajectories into a path set in the parameters of the current regime (Geels & Schot, 2007). For this reason incumbent firms tend to prefer incremental change and the continuation of existing trajectories (Geels, 2014). However, incumbent firms can also adopt innovations that are developed in niches and then utilized in regimes, which gradually trigger further changes in the regime (Geels & Schot, 2007). In addition, large incumbent firms can also develop and market radical innovations and hence have an influence on confronting grand challenges (Geels, 2014). Incumbents may display many ambivalent strategies (Bakker et al., 2012). Consequently, incumbent firms bear the potential in contributing to sustainability through multiple pathways.

The underlying assumption of TEF is that a mismatch between widespread institutions, such as broadly accepted norms, values, belief systems, and industry-specific institutions, does not generate pressure on firms as such. Pressure is rather created through activities – for example, complaints, demands and criticisms by socio-political actors, such as consumers, policymakers, civil society and social movements (Geels, 2014). Consequently, the purpose of TEF is that increasing pressure towards incumbent industries might result in incumbent firms to overcome lock-in mechanisms and reorient towards more radical innovations (Geels, 2014). This is crucial since in addition to incremental innovations, the mounting challenges of the world need radical innovations. Since large firms are capable of pursuing sustainability, they can be seen as agents of sustainability transitions, and consequently, creating sustainable value. Since sustainability transitions have multiple possible pathways, transitions also include multiple types of agency (Geels & Schot, 2007). Firms as agencies can be interpreted as two-fold. Firstly, firms are able to contribute to sustainability within the limits of the current regime related with the concept of weaker sustainability and sustainable development through incremental innovation. Secondly, large firms are capable of acting as agents of radical innovations of sustainability if they are able to overcome the lock-in mechanisms of the existing system.

BUILDING AN INTEGRATION BETWEEN DIFFERENT DISCIPLINES

Integrative concept: Value

Different forms of value

Value is a multifaceted and elusive concept, which is used as a central construct in the form of value propositions when analyzing market opportunities (Anderson et al., 2006) and designing business models (Osterwalder & Pigneur, 2010). From the economic point of view, the two most common notions of value are exchange value and use value. The first one refers to the price of an item in the market, and the latter is determined by how useful an item is to a given person or situation (value-in-use, value-in-context). The latter view has been promoted especially by the service researchers since services are more intangible (e.g. Vargo et al., 2006). In business, it is most relevant to analyze value from

the customer's point of view; that is, the value of the supplier's offering for the customer. In this view, value is normally understood as some form of assessment of perceived benefits against sacrifices required by the customer (e.g. Woodall, 2003). Customer value is, however, a narrow definition of value if we look at larger systems of stakeholders and different perspectives into value. From the system's point of view, besides customer value, we should also consider value for the organization, ecosystem and society, and understand value as not only economic, but as a psychological, sociological and ecological concept (den Ouden, 2012). Only then can we approach what sustainable value as a whole in a system under study could be.

Sustainable value

The idea of value leads to ponder further the relation between sustainability and value within business environments. Sustainability is stated to be one of the firm's key success factors in the long term business strategy (Kuosmanen & Kuosmanen, 2009). Since firms use economic, environmental and social resources to produce goods and services to help the society to satisfy its needs, firms are at the same time both drivers and burdens to sustainable development (Hahn, Figge & Barkemeyer, 2007). The sustainability performance of firms needs to be measured to encourage sustainability instead of burdening it.

The concept of sustainable value (SV) was developed by Figge and Hahn (2004) to measure firms' contributions to sustainability based on opportunity costs. The additional value created by a firm is measured ensuring that every environmental and social impact is in total constant because the idea of strong sustainability requires that each form of capital is kept constant. SV is inspired by the concept of strong sustainability, taking into account corporate eco- and social-efficiency as well as the absolute level of environmental and social resource consumption; in other words, the efficiency and effectiveness of all three dimensions of sustainability (Figge & Hahn, 2004). The outcome of SV is a value that expresses how much more value is created because a firm is more efficient than a benchmark company and because the resources are allocated to the firm and not to benchmark companies (Figge & Hahn, 2004). The target of SV is to measure the potential advantages from the reallocation of resources and to identify firms to or from which resources should be allocated (Kuosmanen & Kuosmanen, 2009). SV steers businesses towards strong sustainability, hence enabling a stable economic position while adapting human activities – in this case business operations – to meet the boundaries of natural resources.

By creating SV, firms are also acting as agents of sustainability transitions since the value creation process ultimately results in stronger sustainability performance. Consequently, the adoption of SV approach can support the firms meeting their sustainability targets at large. First, by adopting the SV approach, the company's business operations contribute to sustainability in all of its dimensions. Second, firms that engage in SV creation challenge the current system. Firms that have created SV have also benchmarked their operations. By gaining a leading position (regarding sustainability) in the markets, firms

are able to apply pressure to their competitors. Eventually, this leads to increasing pressure on the whole business sector and at the same time on the prevailing regime. Also in this case, a firm's agency can be seen as two-dimensional: as agency towards the whole regime but on the other hand also as agency towards competing actors. If SV is closely associated with the concept of strong sustainability, the transition trajectory should proceed towards more radical innovations. However, various elements are likely to contribute to whether the competition caused by the SV approach results in transition pathways set by the parameters of the current regime or stir the transition more towards novel trajectories.

Business models as tools for creating and capturing sustainable value

The idea underlying sustainable value associated with business models is to unveil how SV is created, delivered and captured through business models. Den Ouden (2012) expressed the economic value for the expected users of the system, product or service to be the value for money, which reflects the usefulness of a product/service and value or the price of a product/service compared to the value or price of another product/service. The economic value that companies strive for is profit, and for an ecosystem it is financial stability and resilience. The economic value for society is summarized as wealth. The concepts of ecological value refer to an individual's ecological footprint, eco-effectiveness at a company level, sustainability at the ecosystem level and the livability of the environment at the society level. The livability of the environment relates to biodiversity as well as the physical beauty of nature. The social value for the user translates into belonging, which is an important parameter in determining people's happiness. At the company level, the social value is summarized as social responsibility, which represents the impact of a firm's behavior on society. Value at the ecosystem level from a social perspective translates into reciprocity, reflecting a system to which all parties contribute and from which they benefit. At the societal level, the ultimate value is the greatest happiness of the greatest number of people and meaningful life.

Sustainable business models propose sustainable value, but in practice, the value can be either captured or destroyed or missed (Bocken et al., 2013; 2015). Captured value represents the positive benefits delivered to users and other stakeholders. Destroyed value includes the negative outcomes of the business, such as greenhouse gas emissions, resource scarcity, biodiversity loss, unemployment, the neglect of health and safety, unfair competition and inequality. Missed value represents situations where stakeholders fail to capitalize on existing assets, capabilities and resources, or fail to benefit from the network, which might be due to poorly designed business models.

None of the companies on their own are able to achieve the system level goals (e.g. sustainability goals), but it is possible within a wider ecosystem where companies operate (Hellström et al., 2015). The business model of an individual company can reflect only part of the overall value creation, but it can be seen as a unit that serves a certain function in the ecosystem, thereby enabling system value creation. Firms can be interpreted as individual agents that trigger transitions that can gradually change the wider business

environment and eventually the whole system. Hellström et al. (2015) summarize that the overall system-level value is created in the transactions and non-transactional links between the companies. Thus, to understand the sustainable value created and captured, value analysis and assessment at both the company level and the system level are needed. Sustainable value is created and captured on a system level, but the company level approach is equally important because the value capture of each individual company is ultimately the main incentive for engaging in collaboration.

On the way towards sustainable value creation and capture through business model innovation and strong sustainability, there is a wide range of recognized barriers in three primary areas: regulatory, market and financial, and behavioral and social barriers (Laukkanen & Patala, 2014). It is obvious that companies and regulatory bodies need to take individual and combined action to overcome all these. Companies' task is to create new radical innovations towards sustainability, and well-functioning, consistent and long-term regulatory frameworks should support this development by creating a favorable innovation environment (e.g. Hekkert et al., 2007). To accelerate the transition towards strong sustainability, companies must not remain passive with respect to the system level either, but rather collaborate actively with relevant stakeholders to form common norms that support the creation of sustainable business model innovations.

Preliminary frameworks for integrated sustainability through different disciplines

Synergy between corporate sustainability, business model and system transition literature

The main theoretical elements of the literature review were sustainability, business model and system transition. In this chapter, the synergy between these elements emerges as sustainable business models that create sustainable value. Since none of the companies on their own are able to achieve the system level goals of sustainable development through their business models, system transition had to be integrated into business studies.

Sustainability literature emphasizes the dichotomy of strong and weak sustainability (Williams & Millington 2004). The distinction between strong and weak sustainability describes the general target levels of sustainability. The underlying assumption is that firms should pursue strong sustainability to shift the paradigm towards a sustainable society even if weak sustainability were an improvement compared to the previous circumstances. The literature suggests that companies are able to pursue different levels of sustainability. For example, both business model literature and literature on system transition recognizes firms' sustainability transition capabilities (i.e. Cavalcante et al., 2011; Boons et al., 2013; Geels, 2014). In addition, both disciplines acknowledge that businesses are also able to orientate themselves more towards radical innovations or niche-driving transitions if enough pressure is expected from other system actors or from stakeholders (i.e. Cavalcante et al., 2011; Boons et al., 2013; Geels, 2014). In the literature of business model change, the pathway towards strong sustainability is perceived as a trajectory from incremental innovation through business model innovation and business model redesign to radical innovation (i.e. Boons et al., 2013; Gauthier & Gilomen, 2016).

System transition portrays a similar path from a sustainability transition set by the parameters of the current regime through transition where the current regime adopts niche innovations eventually to sustainability transition where niche innovation pressure alters the current regime (i.e. Geels & Schot, 2007; Geels, 2014). Corporate sustainability literature also recognizes the pathway from weak sustainability to strong sustainability. In the corporate responsibility literature, the trajectory is seen as an ongoing process from business as usual through refined shareholder management and triple bottom line management to truly sustainable business (i.e. Dyllick & Muff, 2015). This implies that in the literature of different disciplines, the terminology varies but the actual phenomena often overlap. To sum up the interdisciplinary literature review, an integrative conceptual framework is proposed in Figure 2 as the outcome of the analysis.

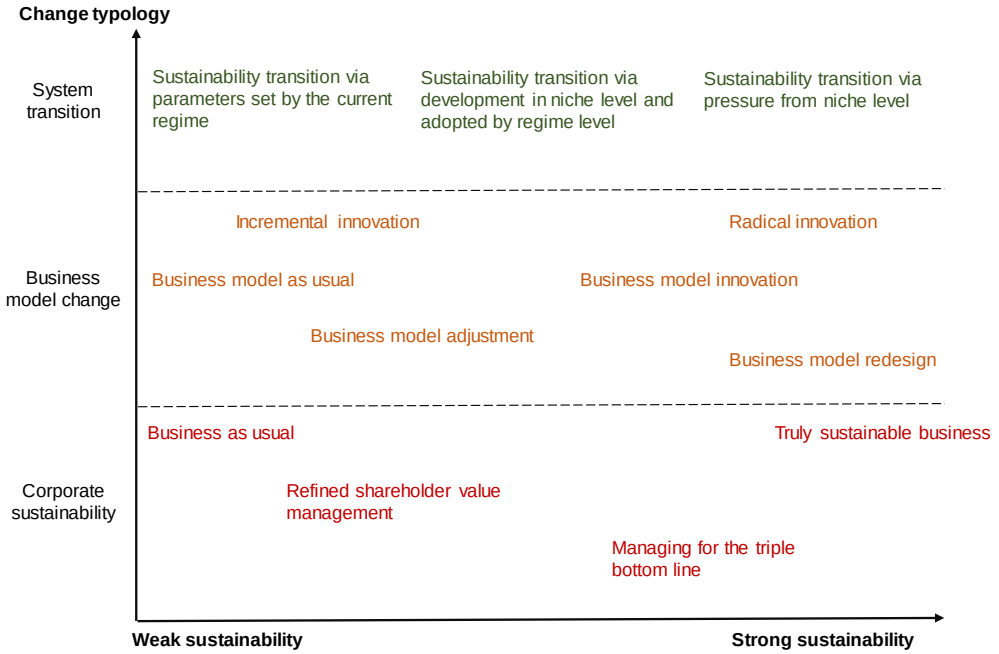

Figure 2. Proposed integrative framework (adapted from Geels, 2014; Gauthier & Gilomen, 2016; Dyllick & Muff, 2015)

Despite the scattered terminology, the capability of firms to create sustainability through agency and sustainable value through business models is acknowledged. The proposed integrative framework could be utilized in the future in analyzing new sustainable business models, system value, and value creation and capture, and eventually in evaluating how strong the sustainability performance of the company is. The proposed framework is an outline that employs a variety of terms for similar phenomena. Understanding similar phenomena in different disciplines may help to reduce the current gap between literatures of system transition and business models.

Illustrations of phenomena are always simplifications of reality, and Figure 2 demonstrates the pathway towards strong sustainability rather roughly. On the end of "weak sustainability" is "business as usual", "incremental innovation", and "sustainability transition via parameters set by the current regime" – not because these phenomena could not contribute to sustainability but because they are typically strongly restricted by the existing environment and hence unable to meet their full sustainability potential. For example, typical end-of-pipe methods that remove already formed emissions do contribute to sustainability but not to the extent as new material saving technology. At the other end of the line, "strong sustainability" encompasses "truly sustainable business", "radical innovation", and "sustainability transition via pressure from the niche level". Figure 2 shows that these phenomena pursue strong sustainability through "refined shareholder value management", "triple bottom line management", "business model adjustment", "business model innovation", and "sustainability transition via development in niche and adopted by regime". The reason why radical innovation and sustainability transition via niche pressure are situated at the end of the strong sustainability is because the radical innovations and niche pressure help the business to overcome the lock-in mechanisms set by the current regime and become truly sustainable.

In reality, the phenomena might overlap also in a vertical sense. In addition, there are multiple transition trajectories, and for that reason, Figure 2 does not imply that only radical innovations are relevant to achieve holistic sustainability. Sustainability transitions are effected, for example, by timing and spatial conditions (Geels & Schot, 2007; Markard & Truffer, 2008). Radical innovations are needed in addition to incremental innovation to achieve major sustainability changes, transform industries and consequently move towards strong sustainability and truly sustainable businesses.

Integration of business model change towards sustainability and system transition

The gap between the system transition research and business model literature remains clear. For example, Markard and Truffer (2008) presented the synergies and differences of transition literature and innovation studies, but the holistic integration is still incompletely researched. Business model literature pays little attention to system level effects on the process of business model change; instead, the focus stays on the company's internal operations (e.g. Abdelkafi & Täuscher, 2016; Gorissen et al., 2016). Transition literature emphasizes system level changes and underplays the role of individual companies. Recently, Geels (2014) emphasized the need for bidirectional interaction between firms and larger systems in the new conceptual framework, TEF. However, these attempts still overlook firms' internal operations. Firms are mainly interpreted as external agents of sustainability transition.

Moreover, the business model literature often leans on reliance on market forces (i.e Dyllick & Muff, 2015; Gauthier & Gilomen, 2016). On one hand, relying solely on markets involves the risk that sustainable development remains slow and weak since markets are driven by other incentives. On the other hand, transition theory often emphasizes governmental steering in creating sustainability (i.e. Geels, 2002; Geels,

2010; Smith et al., 2010; Berkhout et al., 2005). Consequently, the operation of companies is restricted by laws and regulations. This implies that business model literature would need stronger understanding of how policy pressure or governmental steering influences business model change and hence also value capture. In turn, transition literature would benefit from more detailed knowledge of how firms' internal operations affect sustainability transitions and how the agency of firms is represented. Figure 3 visualizes the integration of the two disciplines. The framework is a tentative proposal for the early integration of business model change literature and system transition literature, and therefore, it also has several simplifications.

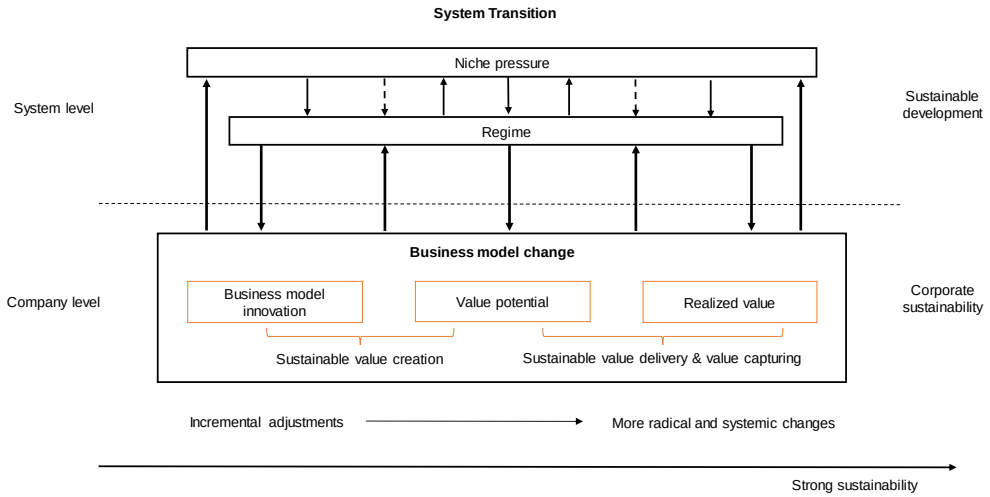

Figure 3. Tentative integration of business model change and system transition

At the company level, the framework introduces business model change towards strong sustainability. The idea underlying sustainable business model is to create economic, ecological, social and psychological benefits for the wide range of stakeholders in the society where the firm operates, to enhance corporate responsibility and further sustainable development. The framework illustrates that the potential and impacts of the sustainable business models are measured through sustainable value created, delivered and captured. First, the idea of business model change towards sustainability is to strengthen the value propositions, i.e. value potential through the business model elements (Osterwalder & Pigneur, 2010), such as key resources, key activities and partnerships that are needed to create value. Second, the framework highlights the fact that the potential value is not always equal to the actual realized value. Potential value can be either captured, destroyed or missed (Bocken et al., 2013; 2015). The overall objective is to increase the realized sustainable value through different value delivery and capture mechanisms. The framework shows that firms can have a dualistic role in their aspirations to meet their sustainability targets. First, by adopting the sustainable value approach, firms contribute to sustainability within all of the firm's dimensions. Second, firms that engage in sustainable value creation challenge the current system. Actions of

businesses pursuing sustainability are interpreted as agency that appears both within individual firms but also within the wider business environment. Firms are able to act as internal sustainability agents through business model change in addition to simply being external agents of sustainability transition. On the other hand, literature (i.e. Hellström et al., 2015; Geels, 2014) stated that individual firms are not able to achieve the system level goals, i.e. sustainable development, since for that bidirectional actions within firms and a wider ecosystem where firms operate are also highlighted. Regime pressure can affect both created potential value and realized value positively or negatively.

At the system level, the framework introduces a sustainable regime towards sustainability. To achieve strong sustainability, a sustainability oriented regime is needed as a gatekeeper for (1) unsustainable niche innovations and for (2) steering through policies or through a regime's legitimacy , business environments towards business model change and hence to capturing sustainable value. Niche pressure is emphasized because niche agency often enables sustainability transitions by driving innovations, implementing regime changes and eventually connecting niche and regime levels (Grin, Rotmans & Schot, 2011). Niche agency is crucial for sustainability transitions since it bears the potential for system level changes and radical innovations (Geels, 2011). This implies that niche pressure is needed for effective sustainability transitions.

Since stable regimes are the outcome of various lock-in mechanisms, they typically reinforce themselves against innovations (Klitkou et al., 2015). This means that regime actors are constrained by parameters from the existing regime. Hence, sustainability transitions enacted by regime actors were found to be path-dependent and trajectories are set by the current regime, thereby evolving through incremental innovation (Geels & Schot 2007). The regime can be a significant barrier for radical innovation to overcome, and typically radical innovations occur only if they are protected in niches (Markard & Truffer, 2008). In reality, transitions happen through multiple trajectories. The interactions of niche and regime levels should be studied more since regime actors may have ambivalent motivations (Bakker, 2014). As lock-in mechanisms typically reinforce a certain pathway of transition, the opportunity of upscaling a given niche depends on the characteristics of the regime in question (Klitkou et al., 2015). For example, Geels and Schot (2007) have presented four different pathways for sustainability transitions: transformation, reconfiguration, technological substitution, and dealignment and realignment. They have also noted that certain transition pathways can shift from one to another. This suggests that even if niche pressure is often crucial for sustainability transitions multilevel interactions are evident and regime conditions, such as policy drivers, also play a role in the transition process. Further, both company level and system level components that create or hinder sustainability transitions need to be concretized in more detail.

CONCLUSION

This work contributes theoretically to existing sustainable business model literature in three ways. First, the paper presents how sustainable business models can be used to

create sustainable value. Sustainable value is captured through business model change from business as usual to truly sustainable business. Challenges in sustainable development, and therefore in corporate sustainability, in business model change and value capture are related to the poor integration of the system level and company level and also to the slow progress towards strong sustainability. However, a firm's capability to act as an agent of sustainability is acknowledged through different disciplines. Sustainable value steers firms towards strong sustainability, hence creating possibilities for a stable economic position while adapting human activities – in this case business operations – to meet the boundaries of natural resources. Hence, value creation can be interpreted as a bridge to sustainable business and later as a component of larger system level transition.

Secondly, the paper presents pathways towards sustainability in relation to companies in different disciplines. Different disciplines use scattered and often overlapping terminology to describe the change from weak sustainability to strong sustainability. A stronger understanding of overlapping typology, while the phenomena remain much the same, can ultimately advance the integration of different disciplines.

Thirdly, the findings imply that there is still a lack of integration between system level (system transition) and company level (business model change). To adopt sustainable business models and hence sustainable value, firms need to consider system level influences on the change process. Since the current regime strongly puts pressure on firms' operations – for example, via legislation – a sustainable regime would assist companies in adopting sustainable business models. To achieve strong sustainability, more synergies between the system level and business environments is needed. This interplay between policy oriented system transition and business model change that focuses on business environments could also be associated with private-public partnerships that aim for cooperation between the public and private sectors.

The focus was theoretical. Since it is likely that the somewhat scattered phenomenon of firms acting as intermediates of sustainability is close to operationalization, the framework should be tested empirically to see the actual adjustment of the framework in business environments.

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