



The Business Performance of New Technology-based Firms: The Importance of the Business Model's Value Proposition and Customer Relationships

Hans Löfsten¹

Chalmers University of Technology, Sweden

Abstract. This study analyses the impact of the business model's value proposition and customer relationships on business performance of new technology-based firms (NTBFs). NTBFs must create a suitable business model to commercialise a new product or service to realize their economic potential and perform as a business. We conducted a survey among 401 small, young Swedish NTBFs in 2016 in the early stages of their existence and applied a multiple regression analysis explaining business performance from various measures capturing value propositions and customer relationships. The results show that performance-enhancing elements for business performance in the early phases are product similarity (to products of other firms), internationalisation and maintaining very close relationships to customers. The finding on product similarity is particularly striking as it suggests that in the early stages of NTBFs it is imitation rather than innovation that may help achieve higher business performance. This study contributes to the literature on NTBFs by showing how various elements of the business model's value proposition and customer relationships affect the firm's business performance in the very early stage of its development.

Keywords: value proposition, customer relationships, business performance, business model, new technology-based firms.

Acknowledgement: The author hereby gratefully acknowledges financial support for this study from the Peter Wallenberg Foundation for Economics and Technology.

1. Introduction

Earlier studies demonstrate that the resources available at a firm's foundation create conditions that can have long-lasting effects on the firm's future performance (Boeker, 1989; Bamford et al., 2000). During this early phase, new technology-based firms (NTBFs) normally have very few resources and need access to resources to commercialise their technologies. NTBFs acquire resources, particularly human scientific resources, in the early stage, which can serve as foundations for development (e.g., Colombo and Grilli, 2005). In general,

1. Chalmers University of Technology, Department of Technology Management and Economics Division of Entrepreneurship and Strategy, SE 412 96 Göteborg, Sweden. E-mail: hans.lofsten@chalmers.se, Phone: +46(0)31-772 12 30

NTBFs are resource-scarce and their initial bundles of resources are not sufficient to create competitive advantages or even to progress from ideas to the commercialisation of their technologies. In addition, these firms often lack financial resources and legitimacy (Kollmer and Dowling, 2004; Brinckmann et al., 2011).

Technological innovations do not generate economic value themselves, and NTBFs need to design a suitable business model that commercialises innovative ideas and technologies (Chesbrough, 2010; Teece, 2010). Fundamental to the development of innovation in technology-based firms is the creation, storage, and dissemination of knowledge, both within and across projects (Löfsten, 2016). For very young firms, defining and developing a value proposition is essential in the initial start-up phase in order to connect the business idea to the customer market, and explore its performance potential (Osterwalder et al., 2014; Reyman et al., 2017). For NTBFs operating in high-tech, fast-changing environments, it is especially important to distinguish themselves from competitors and adapt technologies and businesses to fit the market's needs (Andries and Debackere, 2007), and thus survive in the initial stages. Aaboen et al. (2008) also highlight the links necessary for an NTBF to obtain technology transfer, one of which is universities. New and advanced technologies create new mediums of exchange between firms and their stakeholders, and contribute to new and innovative business models and value propositions (Amit and Zott, 2001, 2015; Chesbrough, 2010).

The business model has become a popular concept in entrepreneurship and strategy research (Klang et al., 2014). This concept helps to identify the building blocks of a business by describing the rationale of how that firm creates, delivers, and captures value. One area of research focuses on business models as a description of the architecture of the firm in its environment (Chesbrough and Rosenbloom, 2002) and often considers the business model as an antecedent to business performance. An initial business model is a construct representing how the firm structures its business during the first critical start-up stages. Previous studies report that choices made at the point of inception might have a significant impact beyond the start-up phase (Aspelund et al., 2005; Geroski et al., 2010). Hence, the initial business model may have a durable effect on the firm's future business performance.

Technology-based firms must be able to create a suitable business model to commercialise a new product in order to realize its economic potential. It is therefore important to increase our knowledge about the different business model dimensions in the high technology sectors and the roles of these dimensions as a part of business and innovation management. Using data from 12 small technology firms, Pellikka and Malinen (2014) show that the business model creates the operational level of the commercialisation process and can help managers plan the value delivery through the process phases. Johnson et al. (2008) state that the elements of the business model are the (i) customer value

proposition, (ii) profit formula, (iii) key resources and (iv) key processes. Therefore, the business model can be defined as a means to integrate technology development and economic value creation (Chesbrough and Rosenbloom, 2002). Balboni et al. (2019) examined how (i) the initial business model of a high-tech start-up, (ii) the subsequent changes in the design themes and (iii) the combinative effect of efficiency and novelty, impact on a start-up's growth performance. Their study is based on a survey of 267 new ventures from high-tech industries and the results highlight the importance of pursuing higher efficiency over the life cycle of a start-up and the differing effect that contextual ambidexterity can have on the growth performance of a start-up firm in separate stages of the NTBF's life cycle.

Most research in the small business sector examines the later phases of NTBFs. This leaves a gap in the very early stages of firms in terms of the effects of value propositions and customer relationships on their business performance. Accordingly, this study examines the effects of these two elements of the Business Model Canvas on business performance measures. Business Model Canvas is a strategic business tool to define and communicate a firm's business idea and it consists of nine elements: key partners, key activities, key resources, value propositions, cost structure, revenue streams, customer relationships, channels and customer segments. This study consequently contributes to the literature on NTBFs by showing how value propositions and customer relationships affect the firm's business performance in the very early stage in its development. By doing so, we can provide a clearer perspective on firms' future prospects. We measure business performance according to earnings before interest and taxes (EBIT) and return on assets (ROA).

Our study uses empirical fieldwork in Sweden, with a dataset consisting of a survey of 401 small, young Swedish NTBFs (the employment mean was 1.80; average firm age of 28.3 months) conducted in 2016. The dataset also contains secondary business data. Studies in the technology sector aimed to define high technology (Markusen et al., 1986, and Monck et al., 1988) state that there are two types of indicators: (1) measures of resource inputs to high-technology activity, such as R&D effort and R&D expenditure; and (2) the employment of qualified personnel and measures of output such as growth rates, patent records, copyrights and licenses and technological innovations. According to Little (1979), small high-tech firms are new firms established with the aim of exploiting a technological innovation associated with a high technological risk.

Little (1979) settles on the following characteristics of an NTBF: (1) it must be less than 25 years old, (2) the business must be based on potential technological innovation or has technological risks over and above those of normal businesses, (3) it must have been established by a group of individuals, (4) it must have been established for the purpose of exploiting a technological innovation. In our study, we use the Eurostat categorisation of manufacturing and service industries according to technological intensity.² Butchart (1987) applies

the industry approach in a study on the United Kingdom, which others applied extensively thereafter (e.g., Brown and Mason, 2014). Based on the General Nomenclature of Economic Activities in the European Communities (NACE) Revision (Rev.) 2 codes, we selected firms in high-technology, medium high-technology, and knowledge-intensive high-technology sectors aggregated at the two-digit level to minimize the risk of identifying separate firms in the data. Table A1 in the Appendix shows the breakdown of our sample into different two-digit NACE Rev. 2 codes. The remainder of this paper proceeds as follows. Section 2 provides a literature review of the two selected elements of the Business Model Canvas and presents our research questions. Section 3 describes the dataset and data collection processes, together with the measures we used in our study. Section 4 describes the statistics and discusses the findings. Finally, Section 5 presents the conclusions.

2. Literature Review and Research Questions

The business model concept is related to innovation and associated with a new range of business design opportunities. Scholars conceptualise the business model phenomenon in different ways and view it from different theoretical perspectives. Chesbrough and Rosenbloom (2002) make a link between business models and the technology management literature. Other researchers, such as Zott and Amit (2007), argue for the idea of business models as boundary-spanning systems of transactions and activities to capture the essence of ‘how firms do business’. Transaction content refers to what is being exchanged, transaction structure refers to how the exchanges are linked and transaction governance refers to the issue of control. During the last decades, the business model concept emerged as a new unit of analysis in organisation theory and management science. Researchers used it in micro-level analyses of resource structures and macro-level analyses of industry structures and market dynamism, strategy, technology management, information systems, innovation management, management and internationalisation (Najmaei, 2014). Despite all of the application areas, research on business models is still open to fundamental questions about its theoretical roots and definitions (Teece, 2010) and the empirical use of the concept business model is criticised for being unclear (Porter, 2001). In strategy research, Porter’s causality chain model (1991) offers a similar approach, as does Eisenhardt and Sull’s (2001) strategy approach. However, entrepreneurship research is not clear about business model components and their causalities (Hedman and Kalling, 2003).

To keep up with competitors and develop innovations, NTBFs require an agile technique. Teece (2010, p. 174) states, ‘a good business model yields value

2. http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/High-tech_statistics

propositions that are compelling to customers, achieves advantageous cost and risk structures, and enables significant value capture by the business that generates and delivers products and services'. There are examples of business model innovations in each of the nine building blocks of the Business Model Canvas, with the value proposition being the most obvious. A business model consists of several elements related to value creation, but the central part is the value proposition, which describes the value the firm creates for its customers (Chesbrough and Rosenbloom, 2002; Magretta, 2002; Morris et al., 2005; Osterwalder and Pigneur, 2010). A business model describes how a firm creates and delivers value for its customers and partners, and at the same time, how it employs parts of this value and thus expresses its underlying business logic (Chesbrough and Rosenbloom, 2002; Teece, 2010; Zott et al., 2011). Research focuses on how activities performed in the context of a firm's business model creates value for its partners and a surplus for customers, while also generating profit (Magretta, 2002; Teece, 2010; Zott et al., 2011). Kay et al. (2019) analyse how established small and medium-sized enterprises (SMEs) respond to potentially disruptive innovations and business models under increasing digitisation. Drawing on the strategic entrepreneurship approach, they argue that SMEs showing opportunity-seeking behaviour are more likely to respond to potentially disruptive innovations and business models proactively. Meyer et al. (2004) use the dramatic rise and fall of a web-economy company from 1997 to 2002 to help students consider the meaning and design of business models. Their paper describes the four business strategies and three distinct business models the company embraced over the previous five years.

Andries and Debackere (2007) and Andries et al. (2013) state that NTBFs' initial business models develop iteratively, which is in line with the firms' development of market knowledge and firm resources. NTBFs often need to collaborate with external partners due to their small pool of resources and lack of legitimacy (Yli-Renko et al., 2001). The business model's firm-centric perspective (Chesbrough and Rosenbloom, 2002; Morris et al., 2005; Teece, 2010) developed towards a view of the business model as network-embedded (Mason and Spring, 2011; Palo and Tähtinen, 2013; Bankvall et al., 2016). Mason and Spring (2011) and Palo and Tähtinen (2013) underline this development, and state that considering the business model at the network rather than firm level can help explain business model creation and practice, as well as the factors that influence the business model itself. A growing body of research examines the levels between management systems and several contextual variables such as environmental uncertainty, product competition, rate of technological change and managerial climate. Several studies indicate that environmental conditions moderate the relationship between entrepreneurial posture and firm performance, including both business and innovation performance, such as patents and licenses (Löfsten, 2015; Rydehell et al., 2019a). This study considers two elements in the Business Model Canvas: the value proposition and customer relationships.

The value proposition is the central element connecting the other parts of the business model to differentiate the firm's business from others (Berends et al., 2016; Chesbrough and Rosenbloom, 2002; Osterwalder and Pigneur, 2010; Osterwalder et al., 2014; Priem et al., 2018). The value proposition describes products and services that create value for a customer segment by satisfying its needs and solving its problems. These values can be quantitative (e.g., price, fast delivery) or qualitative (e.g., design, customer satisfaction). The value proposition is a firm's promise of the value it creates and delivers to its customers (Chesbrough and Rosenbloom, 2002; Morris et al., 2005; Osterwalder et al., 2014). A business value proposition can also be seen as a marketing statement, by which the firm positions itself apart from its competition and explains why the business can survive (Morris et al., 2005; Priem et al., 2018).

A firm's value proposition needs customer interaction to suitably fulfil their expectations and needs (e.g., Fjeldstad and Snow, 2018; Priem et al., 2018). However, it is essential for firms to initially compete with their new products or services in uncertain markets (Brattström et al., 2015). Except for customer interaction, the founder's decisions and interactions with other stakeholders in the environment influences the value proposition. Our first research question is:

RQ1: *How are NTBFs' value propositions related to business performance?*

Relationships in a network may increase a firm's reputations in a market (Hitt et al., 2000; Hoang and Antoncic, 2003) and accelerate market valuations (Stuart et al., 1999). It is easier to build close relationships when the firm has a close reach to customers as actors. We can classify business networks into two types of (support) networks: informal and formal (Birley, 1985). The former consists of personal relationships, such as family and business partners, whereas the latter consists of the suppliers of capital, banks, accountants and lawyers (e.g., Birley, 1985; Löfsten, 2015).

According to Osterwalder and Pigneur (2010), the common types of customer relationships are dedicated personal assistance, self-service automated services, communities and co-creation. Several authors suggest different definitions for the concept of customer relationship management. Romano and Fjermestad (2006) and Cho and Fjermestad (2006) first define it as activities to manage customer relationships to provide the best value to the firm and second as relationship marketing that aims to maintain relationships for the mutual benefit of the firm and its customers. Zablah et al. (2004) define customer relationship management as a continuous process that includes using customer information and improving customer relationships. Accordingly, we propose the following research question:

RQ2: *How are NTBFs' customer relationships related to business performance?*

3. Dataset and Method

3.1. Dataset

This study focuses on Swedish NTBFs founded between 2013 and 2015. We identified our sample using the Retriever Business database, which contains information on all Swedish companies³, and used it to collect secondary business data. To focus on genuine businesses and avoid hobby and lifestyle businesses, we sampled only firms organized as limited companies. To control for heterogeneity among new firms (Davidsson, 2007; Wennberg, 2005), we restricted our analysis to independent firms (not belonging to a business group), thus avoiding spin-offs from existing businesses and other start-ups that are not true *de novo* firms. To ensure that the firms in our sample are real and have started some kind of operations, we filtered the sample to include only those registered in certain years (2013 to 2015) and active (not deregistered or liquidated, etc.), which must pay value-added tax and must make a tax prepayment. We therefore excluded dormant, shelf and other inactive entities. A practical restriction in our sampling was that the firms had to have valid contact information (telephone numbers) so that interviewers could contact them. Adopting this approach also ensured that we obtained responses from active firms (a firm with no contact information is more likely to be a non-active firm). Our sampling resulted in a population of 2,329 firms, of which 1,230 (52.8%) were founded in 2013, 812 (34.9%) in 2014 and 287 (12.3%) in 2015 (see Table 1). We received valid responses from 401 firms—a response rate of 17.2%.

Table 1 summarizes the entire sample, including the respondent characteristics, and compares these with non-respondents. Non-respondents have somewhat lower sales, profits, and profitability, but also higher total assets. The only significant difference between respondents and non-respondents is the establishment year (significant at the 0.05 level). The respondents have few employees (mean = 1.80) and have high returns on total capital (mean = 16.47%). The respondent firms' average age is 28.3 months. The oldest firms started in January 2013 (39 months; the survey occurred over March–April 2016) and the youngest firms are six months old.

3. <http://business.retriever.se/>

Table 1. Descriptive statistics for the surveyed new technology-based firms, 2016.

<i>1. Sample and response rate</i>							
<i>Firms</i>							
<i>N</i> (population: 2459)				Invalid firms: 130			
<i>n</i> (response): 401				Response rate (%): 17.2			
No response: 1928							
<i>2. Business data - Means and standard deviations</i>							
	<i>Sample</i>						
	<u>Response</u>			<u>No response</u>			
	401 firms			1928 firms			
	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Sig (2-tailed)</i>
Start year ^a	401	2,013.52	0.70	1,918	2,013.61	0.70	0.013*
Employment ^b	377	1.80	6.62	1,812	1.72	10.53	0.858
Sales ^c	377	2,177.26	10,724.77	1,812	2,071.82	10,346.82	0.636
Total capital ^c	377	1,388.20	5,324.68	1,812	1,896.56	20,688.24	0.636
EBIT ^c	377	234.72	779.00	1,812	208.99	1,356.28	0.722
Return on total capital ^d	377	16.47	47.32	1,812	12.25	95.75	0.403
<i>3. Technology level, founding year and firm age (responding firms)</i>							
<u>Technology level</u>		<u>Founding year and number of firms</u>					
		Year 2013	Year 2014	Year 2015	Sum	Percent	
High-tech		15	3	0	18	4.49	
Mid-tech		21	11	2	34	8.48	
Knowledge intensive		205	99	45	349	87.03	
Sum		241	113	47	401	100.00	
<i>4. Innovation performance and technology level in the NTBFs</i>							
<u>Private capital - firms start^d</u>		<u>Incubator localization^e</u>					
<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>		
401	0.93	0.25	400	0.10	0.29		
<i>5. Firm age (months)</i>							
<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>SD</i>			
401	6	39	28.32	8.59			
<i>6. Innovation performance and technology level in the NTBFs</i>							
	<i>Mean</i>	<i>SD</i>	<i>Scale</i>				
Number of patents	0.10	0.78	Number				

Number of patents 2013-2015 divided into different technology levels			
	N	Mean	SD
High-tech	18	0.39	1.195
Mid-tech	34	0.18	0.521
Knowledge intensive	348	0.08	0.777
5. Sectors - frequencies (%)			
	Sample	No response	
	Response	No response	
Manufacturing	8.50	7.28	
Construction	0.25	0.57	
Wholesale and retail trade	1.50	2.27	
Transportation and storage	0.25	0.15	
Accommodation and food service activities	0.00	0.21	
Information and communication	75.00	79.55	
Financial and insurance activities	0.50	0.05	
Real estate activities	0.00	0.05	
Professional, scientific, and technical activities	13.25	7.75	
Administrative and service support activities	0.25	0.41	
Education	0.00	0.31	
Human, health and social work activities	0.25	0.78	
Arts, entertainment, and recreation	0.25	0.46	
Other service activities	0.00	0.16	
Sum	100.00	100.00	

Notes:

^aYear

^bNumber of employees

^c1,000 SEK

^dPercent

^eYes/No (1/0)

* $p < 0.05$

3.2. Data Collection, Measures and Statistical Analysis

This study was part of a questionnaire on NTBFs in Sweden that also included questions about business networks and localisation (Rydehell et al., 2019a), as well as business experience, growth orientation, proximity and R&D networks (Rydehell et al., 2019b). We collected data by developing a survey questionnaire in two steps before finalizing it. First, we discussed the entrepreneurs' perceptions of their businesses, including key resource dimensions to measure

them quantitatively. The questionnaire was also thoroughly pretested and modified after discussions with six firms; that is, we tested the survey through a pre-test with six NTBFs (that were not previously interviewed) by telephone to identify uncertainties and avoid misunderstanding in the final survey.

The final survey occurred during March–April 2016 by telephone through one of Sweden's largest and most respected marketing research companies (TNS-Sifo: The National Institute for Consumer Research). In order to ensure the validity of the sample, we collected all data for the questionnaire through TNS-Sifo. Telephone surveys generally reduce the risk of misunderstanding in interpreting the questions, as the interviewers are trained and can lead the respondent through the survey. In order to increase the validity of the measures, the questionnaire was double-checked by TNS-Sifo with regard to language and ease of understanding. We increased the inter-rater reliability by using randomly selected experienced professional callers. To ensure the consistency and quality of responses, the interview process was monitored and taped.

We scored all measures in the questionnaire on a 5-point scale or a binary Yes = 1, No = 0. Among the non-respondents, some firms could not be located, nor did they have any activity, while the others stated that they did not have time to answer the questionnaire or did not wish to respond to the survey without providing any specific reason. Any problems with the questionnaire (e.g., misunderstanding) were captured in the monitoring process; 41% of the statistical loss was because the firms did not answer the phone call. The analysis consists of 16 variables (for means and standard deviations, see Table A2 in the Appendix).

The *value proposition* describes what value the firm creates for its customers and what is the purpose of the business (Chesbrough and Rosenbloom, 2002; Magretta, 2002; Morris et al., 2005; Osterwalder and Pigneur, 2010). For very young and small NTBFs, developing a value proposition is essential in the initial start-up phase to connect the business idea to the customer market, and to explore its performance potential (Osterwalder et al., 2014; Reymen et al., 2017; Amit and Zott, 2001, 2015; and Chesbrough, 2010). These items were measured according to Likert-type scales ranging from 1–5 (Variables 1–4 in Table A2).

Customer relationships define the type of relationships the firm wishes to establish with its customer segments. There are several reasons to establish unique relations: few or many customers, exports, the firm's relationship to its customers, marketing, and distribution channels. Romano and Fjermestad (2006) and Cho and Fjermestad (2006) define it as the activities to manage customer relationships to provide the best value to the firm. Most items in this element were measured using a binary 1/0 scale (Variables 5–10 in Table A2).

The analysis also includes four control variables for firm age, incubator localisation, patent and private capital – all measured at firm start. The control variable private capital has no significant relationships to EBIT and ROA in the correlation matrix (Table A2) and is therefore not included in the regression analysis. Including control variables helps to separate the statistical results from

firm age, localisation effects, intellectual property and financing issues. We gathered the EBIT and ROA measures during Spring 2016 and for accounting year 2015 (Comparable measures: Cooper and Artz, 1995; Yagüe-Perales and March-Chorda, 2013 and Löfsten, 2014a, 2014b). To ensure that the dataset did not show any significant differences between firms with different founding years, we conducted an independent sample t-test, which compares the means between two unrelated groups for the same variable. We separated the groups (start years 2013 and 2014, 2013 and 2015, and 2014 and 2015) by creating a grouping variable called 'start year'. Because there are few differences between the years of these variables, we do not consider these differences as serious.

When using self-reported questionnaires to collect data at the same time from the same participants, common method variance may be a concern, and more so when both the dependent and central explanatory variables are perceptual measures derived from the same respondent (Podsakoff and Organ, 1986). Podsakoff et al. (2003) analyse four general sources of common method variance: the use of a common rater, how items are presented to respondents, the context of the items on a questionnaire, and other contextual influences (time, location, media, etc.). One solution to common method variance is to send out a questionnaire to several respondents in each firm and then calculate the average. This was not a valid strategy for this study because very small firms are typically organisations in which only one person fits the respondent criteria. However, we adopt several approaches in this study to avoid or correct common method bias: (i) we constructed the dependent variables (EBIT and ROA) using information from sources besides the questionnaire (accounting measures), (ii) we used different scale types (1-5 and 1/0) and (iii) we used different headings and sections for the different items in the questionnaire.

Our statistical analysis consisted of two steps. First, we applied a correlation analysis to identify the statistically significant interrelations (at the variable level: see Table A2 in the Appendix). Second, we used regression analysis to test the links between the dependent variables (EBIT and ROA) and the 10 independent and control variables.

4. Analysis

4.1. Regression Analyses⁴

In our second step, we apply a multiple regression analysis. Because we expressed all independent measures in Likert-type scales (from 1 to 5 or 1/0), there was no risk that extreme values will affect the means. The four multivariate

4. Only the control variables that are significantly related with EBIT or ROA in the correlation matrix are included in the regression analysis.

linear models test the relationships between the dependent variable business performance (EBIT and ROA) and the 10 independent variables. Table 2 reports the results of the regression analyses and indicate four strongly significant regression models. We conducted one test to verify the findings. A VIF greater than 5 is generally considered evidence of multicollinearity, and a tolerance below 0.20 is a cause for concern. However, we could find no indication of multicollinearity in the statistical analysis (collinearity statistics: see Table A3 in Appendix). The table also reports on the 10 independent variables together with the control variables, as well as the R squared and adjusted R squared.

Table 2. Regression analysis explaining business performance.

	EBIT	EBIT	ROA	ROA
	Model 1	Model 2	Model 3	Model 4
	Sig=0.000	Sig=0.000	Sig=0.000	Sig=0.000
1. Does the firm develop a product (1) or a service (5)	104.190** (33.164)	89.427* (38.638)	7.756*** (1.982)	7.310*** (1.993)
2. Is the firm's main product/service – compared to other firms – very similar (1) / very different (5)	-113.785*** (37.717)	-105.865** (38.547)	-7.784*** (1.959)	-7.246*** (1.990)
3. Is the firm's main product/service – compared to other firms – much cheaper (1) / far more expensive (5)	45.422 (53.233)	52.527 (53.323)	2.533 (2.764)	2.531 (2.572)
4. Is the firm's main product/service – compared to other firms – of much lower quality (1) / much higher quality (5)	-16.702 (60.588)	-34.611 (61.084)	0.545 (3.146)	-1.095 (3.180)
5. Are the firm's main customers – firms and other organizations (business to business) (0) or consumers (business to customers) (1)	-108.495 (235.106)	-119.734 (235.734)	-15.888 (12.208)	-17.424 (12.150)
6. Are the firm's main customers a few large customers (0) or many small customers (1)	41.328 (114.868)	65.785 (115.611)	-4.352 (5.965)	-4.671 (5.980)
7. Has the firm sold its main product/service outside of Sweden (0/1)	236.903* (95.401)	232.264* (95.973)	-3.090 (4.954)	-2.509 (4.971)
8. The firm's relationships to its main customers - very distant (1) or very close (5)	85.454 (55.661)	91.489 (55.599)	7.344* (2.890)	7.295* (2.869)
9. Is the firm marketing via – indirect channels, mass media, flyers (0) or direct channels, visits, meetings, telephone calls (1)	113.879 (125.309)	116.512 (125.631)	5.074 (6.507)	2.995 (6.528)
10. The firm's distribution channels – indirect via distributors (0) or direct, own stores or sellers (1)	172.057 (130.596)	154.729 (130.621)	2.900 (6.781)	1.941 (6.738)
Intercept	-616.338 (403.638)	-512.972 (405.606)	-35.486 (20.960)	0.330 (24.136)
11. Firm age (months)				-0.873** (0.321)
12. Incubator localization (0/1)		-145.366 (155.080)		-4.968 (8.002)
13. Patent (number)		-128.466 (66.857)		-4.669 (3.463)
R square	0.114	0.129	0.213	0.238
Adjusted R square	0.085	0.095	0.187	0.206
F	3.934	3.752	8.031	7.270

Notes: Model 1 and 2 - dependent variable: EBIT. Model 3 and 4 – dependent variable: ROA. Unstandardized beta coefficients are reported (standard errors in parentheses). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$.

The four regression models are significant ($p < 0.005$) and support the conceptual framework. However, only some of the individual independent variables are significant in the two models. Both variables 1 and 2 in Table 2 are significant (for both EBIT and ROA). However, variable 1 (measuring whether the NTBF creates a service rather than a product) has a positive relationship to EBIT and ROA, and variable 2 (measuring whether the NTBF's product/service is different rather than similar to those of other firms) has a negative relationship to EBIT and ROA. Variable 7, a measure of internationalisation, has a significant positive relationship to EBIT (models 1 and 2), and variable 8 (measuring whether the NTBF maintains close rather than distant relationships with its main customers) has a significant positive relationship to ROA (models 3 and 4). The adjusted R square for model 1 is 8.5%, for model 2 it is 9.5%, for model 3 it is 18.7% and for model 4 it is 20.6%. We can conclude that models 3 and 4 are somewhat stronger than models 1 and 2 are in terms of the adjusted R squared. Considered together, the regression analyses imply that variables 1 and 2 (capturing variables of value proposition) are the most important variables for business performance. The next section discusses the implications of these results for research and practice.

4.2. Discussion

Earlier research focuses on how a firm's activities in the context of its business model create value for its partners while also generating profit (Magretta, 2002; Teece, 2010; Zott et al., 2011). Our study is in line with those of Osterwalder et al. (2014) and Reymen et al. (2017) because the firm's value proposition is essential. In this study, the NTBFs' value proposition is important in the initial start-up phase. We explore the performance potential of the value proposition because it has an unconditional business performance effect. Consequently, this study contributes to the research on business modelling, especially that of the value proposition, which is its core element. New firms that fail to establish value propositions in the beginning focus too much on a first business idea and find it difficult to adapt their businesses to fit a market (Andries et al., 2013; Chesbrough and Rosenbloom, 2002), and thus create problems for the development of their business models. Few studies focus on NTBFs' value propositions in the very nascent stages because limited information is available on the effect of stakeholder information on a firm's value proposition. Accordingly, this study clarifies this gap by analysing the relationship between a firm's value proposition and its business performance.

However, regarding the two Business Model Canvas elements we analysed in the NTBFs' early phases, we find some unexpected results. We can state a positive impact on business performance among the NTBFs in our dataset for firms that produce a service that does not differ much from that of its competitor.

These results are connected to the firm's value proposition and business performance (RQ1). However, improving a product or service is a common way to create value for customers. NTBFs operating in knowledge-intensive industries, as in our study, distinguish themselves based on several traits, including size, R&D intensity and innovative capacity. In this regard, our study also reveals that few early firms had patents (10%). We can compare this to Löfsten's (2015) finding that 41% of the somewhat older NTBFs had at least one patent.

As both managers and academics increasingly raise issues about the real value of customer relationships in a firm's business model, some of the customer relationships variables have a performance effect (RQ2). This study advances research on customer relationships by investigating the role of the critical mechanisms underlying the customer relationships-business performance link. For the business performance measure ROA, the firm's relationship with its main customers – very close rather than very distant – is positive and significant. Understanding how firms can profit from their customer relationships is highly important for both practitioners and academics (Boulding et al., 1994; Payne and Frow, 2005). Prior research characterises customer relationship management as basically reshaping the marketing field and evolving as a part of marketing's new dominant logic (Day, 2004). Scholars argue that a firm's practices for leveraging associations with customers can be fundamental to sustaining a competitive advantage (Hogan et al., 2002; Mithas et al., 2005).

With the focus on how strategic choices at the firm's early stage affect business performance, we build on prior studies by Eisenhardt and Schoonhoven (1990), Kimberly (1979), Kirchoff and Phillips (1988) and Van Doorn et al. (2013). Kimberly (1979) concludes that environmental conditions, the founder's personality, and the initial strategic choices have an enduring effect on a firm's behaviour. Eisenhardt and Schoonhoven (1990) show that founding teams have permanent effects on a firm's performance of firms. However, we know little about how the entrepreneurs' initial business models can lay the foundation for future performance at the time of founding. More systematic knowledge about the relationships between business models and future subsequent business performance will help improve the practices in starting new firms and making them perform. This in turn generates some platforms for practitioners, firm support communities such as incubators and Science Parks, and different stakeholders to evaluate business models during the early start-up phase.

One important and interesting finding in this study is that in the early stages of NTBFs it is imitation rather than innovation that affects the firm's early business performance. There is a negative impact on business performance (EBIT and ROA) if the NTBFs produces a main product/service which is very different compared to other firms in the industry. Imitation is a business strategy used to obtain knowledge from those firms that are already more advanced and the bigger the advance of a firm, the more likely it is to be imitated by other firms. The

possibility of competitive imitation suggests that entrants need to strategically decide whether to reveal their ideas by competing through a new business model or conceal them by adopting a traditional rationale of value creation (Casadesus-Masanell and Zhu, 2013). While patents, licenses and copyrights exist to prevent competitors, they are not commonly applicable to value propositions in a business model (Casadesus-Masanell and Zhu, 2013).

Researchers have studied how new products, services or processes can be imitated by their competitors and according to Casadesus-Masanell and Zhu (2013) imitation is closely related to the broader literature on the transfer of best practices among firms (Csaszar and Siggelkow, 2010). Scholars have identified factors such as the absorptive capacity of the imitator (Cohen and Levinthal, 1990; Kogut and Zander, 1992; Szulanski et al., 2004). Defending technologies from imitation is a serious issue and the limited resources of NTBFs prevent these firms from obtaining and then using patent protection (Acs and Audretsch, 1990). A high-tech entrepreneurial venture usually protects itself from the risk of imitation by innovating and producing new technologies (Colombo et al., 2015). Schumpeter (1934) distinguishes between five types of innovation: new products, new methods of production, new sources of supply, exploitation of new markets and new ways to organize business. Zhou (2006) compares the effects of innovation and imitation strategies on new product performance and the empirical results from a cross-industry survey is that an innovation strategy leads to better product performance and the benefits of an innovation strategy over an imitation strategy become stronger as market demand is uncertain and technologies also change rapidly. The increasing competitiveness or imitation by competitors, is responded with more innovative efforts by firms (Fiates et al., 2010). However, according to Sadowski and Sadowski-Rasters (2006), empirical studies explicitly analyzing the imitation-innovation antagonism are quite rare.

Research literature on business model innovation has mainly devoted attention to high-tech entrepreneurial ventures illustrating that business model innovation creates entrepreneurial opportunities (Amit and Zott, 2001; Zott and Amit, 2007). NTBFs need to exploit external networks and resources not available inside the firm in order to innovate and commercialize their products and services. The incorporation of for example open innovation in the business model could be an interesting additional competitive strategy for NTBFs with limited resources. Imitation can be considered on par with innovation as an alternative strategic option for early business performance and the literature has also noted the importance of imitation. However, the significance of innovation is still overemphasized in some parts of the research literature where imitation could be a more important business strategy.

For researchers studying NTBFs, this study adds to prior research by investigating NTBFs in the very early stage of development. Studying NTBFs in this phase broadens the view of these firms and highlights what may be important for firms' initial resources in order to enhance business performance.

Furthermore, an important area for continued research is to develop usable measures of business models in a quantitative setting and to contribute to future scale development in business model research. Further, we study a broad sample of NTBFs in different industry sectors. We can thus capture a general view of NTBFs and their business performance (EBIT and ROA). However, this study has also several limitations, such as the risk of common method bias. The survey was based only on a single point in time, but the NTBFs' value propositions and customer relationships evolve with interaction and over time.

5. Conclusions

We investigated the impact of the business model's value proposition and customer relationships on business performance of new technology-based firms (NTBFs). The value proposition and customer relationships are important for NTBFs to create value. Our empirical results lead to several conclusions. We find that, in general, the NTBFs' value propositions and customer relationships are important elements of business performance for very young firms. These are two keys to the start of firm operations. However, we also find that only a few specific variables of the value proposition and customer relationships are positively related to business performance. In particular, the firms' products or services (mainly services) should not be very different than those offered by other firms in the industry, emphasising the important role of imitation to achieve high business performance for NTBFs in the very early stages of their existence. We also find positive associations with business performance for internationalisation activities and maintaining close relationships with customers. Hence, we conclude that, in general, very young NTBFs need to consider their value propositions and customer relationships. This study contributes to the literature on NTBFs by showing how these elements affect a firm's business performance in the very early stage in its development. By doing so, we have been able to provide a clearer perspective of firms' future prospects.

Appendix

Table A1. Sectors by two-digit level NACE Rev. 2.

Industry codes (two-digit level) – sectors – frequencies (%)	Sample	
	Response	No response
02. Forestry and logging	0.00	0.10
08. Other mining and quarrying	0.00	0.10
10. Manufacture of food products	0.00	0.10
11. Manufacture of beverages	0.00	0.10
20. Manufacture of chemicals and chemical products	0.07	0.50
21. Manufacture of basic pharmaceutical products and pharmaceutical preparations	0.00	0.10
25. Manufacture of fabricated metal products, except machinery and equipment	0.20	0.40
26. Manufacture of computers, electronics, and optical products	1.70	1.60
27. Manufacture of electrical equipment	0.70	0.80
28. Manufacture of machinery and equipment	3.20	1.90
29. Manufacture of motor vehicles	0.70	0.80
30. Manufacture of other transport equipment	3.20	0.20
32. Other manufacturing	0.70	0.80
33. Repair and installation of machinery and equipment	0.20	0.00
41. Construction of buildings	0.50	0.10
43. Specialised construction activities	0.20	0.50
45. Wholesale and retail trade and repair of motor vehicles and motorcycles	0.50	0.20
46. Wholesale trade, except of motor vehicles and motorcycles	0.50	0.80
47. Retail trade, except of motor vehicles and motorcycles	0.50	1.30
49. Land transport and transport via pipelines	0.20	0.10
52. Warehousing and support activities for transportation	0.00	0.10
55. Accommodation	0.00	0.10
56. Food and beverage service activities	0.00	0.20
58. Publishing activities	0.70	0.60
59. Motion picture, video and television programme production, sound recording and music publishing activities	10.20	11.90
60. Programming and broadcasting activities	0.00	0.10
61. Telecommunications	1.50	1.60
62. Computer programming, consultancy and related activities	57.10	59.40
63. Information service activities	5.50	6.10
64. Financial service activities, except insurance and pension funding	0.20	0.00
66. Activities auxiliary to financial services and insurance activities	0.20	0.10
68. Real estate activities	0.00	0.10
69. Legal and accounting activities	0.20	0.10
70. Activities of head offices; management consultancy activities	1.70	1.50
71. Architectural and engineering activities; technical testing and analysis	3.20	0.90
72. Scientific research and development	5.70	3.80
73. Advertising and market research	0.70	0.60
74. Other professional, scientific and technical activities	1.50	0.90
77. Rental and leasing activities	0.20	0.20
78. Employment activities	0.00	0.10

80. Security and investigation activities	0.00	0.10
81. Services to buildings and landscape activities	0.00	0.10
82. Office administrative, office support and other business support activities	0.00	0.10
85. Education	0.00	0.30
86. Human health activities	0.20	0.80
90. Creative, arts and entertainment activities	0.20	0.40
93. Sports activities and amusement and recreation activities	0.00	0.10
95. Repair of computers and personal and household goods	0.00	0.10
96. Other personal service activities	0.00	0.10
Sum	100.00	100.00

Table A2. Correlations on the variable level.

	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Does the firm develop a product (1) or a service (5)	4.04	1.28															
2. Is the firm's main product/service – compared to other firms – very similar (1) / very different (5)	2.96	1.32	-.358**														
3. Is the firm's main product/service – compared to other firms – much cheaper (1) / far more expensive (5)	2.85	0.89	.039	-.022													
4. Is the firm's main product/service – compared to other firms – of much lower quality (1) / much higher quality (5)	3.99	0.78	-.035	.138**	.319**												
5. Are the firm's main customers – firms and other organizations (business to business) (0) or consumers (1)	0.05	0.22	-.118*	.132**	-.030	-.029											
6. Are the firm's main customers a few large customers (0) or many small customers (1)	0.25	0.43	-.136**	.101*	-.146**	-.052	.371**										
7. Has the firm sold its main product/ service outside of Sweden (0/1)	0.37	0.48	-.169**	.169**	-.016	.113*	.064	.058									
8. The firm's relationship to its main customers- very distant (1) or very close (5)	4.38	0.90	.067	-.032	.095	.053	.316*	-.223**	.127*								
9. Is the firm marketing via – indirect channels, massmedia, flyers (0) or direct channels, visits, meetings, telephone calls (1)	0.81	0.39	.034	-.030	.048	.002	-.346**	-.238**	-.163*	.282**							
10. The firm's distribution channels – indirect via distributors (0) or direct, own stores or sellers (1)	0.87	0.34	.182**	-.075	-.009	-.006	-.080	-.133**	-.082	.155**	.181**						
Control variables																	
11. Firm age (months)	28.32	8.59	-.028	.066	-.089	-.124	.029	-.059	.104*	-.090	-.127*	-.064					
12. Incubator localization (0/1)	0.10	0.29	-.185**	.245**	-.007	-.039	.004	.112*	.051	-.024	-.075	-.101*	.028				
13. Patent (number)	0.10	0.78	-.097	.121*	.003	.010	.014	.104*	.039	.001	.030	-.053	.098	.197**			
14. Private capital – at firm start (0/1)	0.93	0.251	-.046	-.001	-.030	-.018	.016	.015	-.041	-.007	.063	-.046	.028	.019	-.105*		
15. EBIT ¹	234.72	779.00	.237**	-.222**	.059	-.004	-.101	-.079	.027	.128*	.066	.134*	-.020	-.150**	.124*	.014	
16. ROA ²	16.47	47.32	.288**	-.303**	.057	-.021	-.183**	-.140**	-.145**	-.157**	.096	.116*	-.131*	-.131*	-.107*	-.019	427**

Notes: * p<0.05, ** p<0.01 ¹ 1,000 SEK² Per cent

Table A3. Collinearity statistics.

	Model 1	Model 1	Model 2	Model 2
Variable	Tolerance	VIF	Tolerance	VIF
1.	0.836	1.197	0.813	1.230
2.	0.848	1.180	0.814	1.229
3.	0.865	1.156	0.863	1.159
4.	0.862	1.160	0.848	1.180
5.	0.738	1.355	0.732	1.366
6.	0.812	1.231	0.799	1.251
7.	0.918	1.090	0.908	1.101
8.	0.839	1.192	0.839	1.192
9.	0.791	1.265	0.784	1.276
10.	0.924	1.083	0.919	1.088
15.			0.891	1.122
16.			0.950	1.052
	Model 3	Model 3	Model 4	Model 4
Variable	Tolerance	VIF	Tolerance	VIF
1.	0.836	1.197	0.812	1.231
2.	0.848	1.180	0.812	1.231
3.	0.865	1.156	0.861	1.161
4.	0.862	1.160	0.832	1.202
5.	0.738	1.355	0.731	1.367
6.	0.812	1.231	0.795	1.259
7.	0.918	1.090	0.901	1.110
8.	0.839	1.192	0.838	1.193
9.	0.791	1.265	0.772	0.295
10.	0.924	1.083	0.919	1.088
15.			0.936	1.068
16.			0.891	1.123
17.			0.942	1.061

References:

- Aaboen, L., Lindelöf, P. and Löfsten, H. (2008), "Towards incubator facilitation of technology transfer", *International Journal of Management and Enterprise Development*, 5(3): p 331-355.
- Acs, Z.J and Audretsch, D.B. (1990), *Innovation and Small Firms*, Cambridge MA: MIT Press.
- Amit, R. and Zott, C. (2001), "Value creation in e-business", *Strategic Management Journal*, 22(6-7): p 493-520.
- Amit, R. and Zott, C. (2015), "Crafting business architecture: The antecedents of business model design", *Strategic Entrepreneurship Journal*, 9(4): p 331-350.
- Andries, P. and Debackere, K. (2007), "Adaptation and performance in new businesses: Understanding the moderating effects of independence and industry", *Small Business Economics*, 29(1-2): p 81-99.
- Andries, P., Debackere, K. and Looy, B. (2013), "Simultaneous experimentation as a learning strategy: Business model development under uncertainty", *Strategic Entrepreneurship Journal*, 7(4): p 288-310.
- Aspelund, A., Berg-Utby, T. and Skjvedal, R. (2005), "Initial resource's influence on new venture survival: A longitudinal study of new technology-based firms", *Technovation*, 25(11): p 1337-1347.
- Balboni, B., Bortoluzzi, G., Pugliese, R. and Tracogna, A. (2019), "Business model evolution, contextual ambidexterity and the growth performance of high-tech start-ups", *Journal of Business Research*, 99: p 115-124.
- Bankvall, L., Dubois, A. and Lind, F. (2016), "Conceptualizing business models in industrial networks", *Industrial Marketing Management*, 60: p 196-203.
- Bamford, C.E., Dean, T.J., and McDougall, P.P. (2000), "An examination of the impact of initial founding conditions and decisions upon the performance of new bank start-ups", *Journal of Business Venturing*, 15(3): p 253-277.
- Berends, H., Smits, A., Reymen, I., and Podoyntsyna, K. (2016), "Learning while (re)configuring: Business model innovation processes in established firms", *Strategic Organization*, 14(3): p 181-219.
- Birley, S. (1985), "The role of networks in the entrepreneurial process", *Journal of Business Venturing*, 1(1): p 107-117.
- Boeker, W. (1989), "Strategic change: The effects of founding and history", *Academy of Management Journal*, 32(3): p 489-515.
- Boulding, W., Lee, E., and Staelin, R. (1994), "Mastering the mix: Do advertising, promotion, and sales force activities lead to differentiation?", *Journal of Marketing Research*, 31(2): p 159-172.
- Brattström, A., Löfsten, H. and Richtner, A. (2015), "Similar, yet different: A comparative analysis of the role of trust in radical and incremental product innovation", *International Journal of Innovation Management*, 19(4): 1550043.
- Brinckmann, J., Salomo, S. and Gemuenden, H.G. (2011), "Financial management competence of founding teams and growth of new technologybased firms", *Entrepreneurship Theory and Practice*, 35(2): 217-243.
- Brown, R., and Mason, C. (2014), "Inside the high-tech black box: A critique of technology entrepreneurship policy", *Technovation*, 34(12): p 773-784.
- Butchart, R.L. (1987), "A new UK definition of the high technology industries", *Economic Trends*, 400: p 82-88.
- Casadesus-Masanell, R. and Zhu, F. (2013), "Business model innovation and competitive imitation: The case of sponsor-based business models", *Strategic Management Journal*, 34(4): p 464-482.
- Chesbrough, H. (2010), "Business model innovation: Opportunities and barriers", *Long Range Planning*, 43(2-3): p 354-363.
- Chesbrough, H., and Rosenbloom, R.S. (2002), "The role of the business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies", *Industrial and Corporate Change*, 11(3): p 529-555.
- Cho, Y. and Fjermestad, J. (2006), "Using electronic customer relationship management to maximise/minimize customer satisfaction/dissatisfaction", In: J. Fjermestad and N.C. Romano (eds.), *Electronic Customer Relationship Management*, New York: M.E. Sharpe Inc, p 34-50.

- Colombo, M.G., and Grilli, L. (2005), "Founders' human capital and the growth of new technology-based firms: A competence-based view", *Research Policy*, 34(6): p 795-816.
- Cooper, A.C., and Artz, K.W. (1995), "Determinants of satisfaction for entrepreneurs", *Journal of Business Venturing*, 10(6): p 439-457.
- Czaszar, F.A. and Siggelkow, N. (2010), "How much to copy? Determinants of effective imitation breadth", *Organization Science*, 21(3): p 661-676.
- Cohen, W.M. and Levinthal, D.A. (1990), "Absorptive capacity: A new perspective on learning and innovation", *Administrative Science Quarterly*, 35(1): p 128-152.
- Colombo, M.G., Mohammadi, A. and Lamastra, C.R. (2015), "Innovative business models for high-tech entrepreneurial ventures: The organizational design challenges", In: N. Foss and T. Saebi (eds.), *Business Model Innovation: The Organizational Dimension*, Oxford: Oxford University Press, p 169-190.
- Davidsson, P. (2007), "Strategies for dealing with heterogeneity in entrepreneurship research", Paper presented August 7th at the Academy of Management Conference, Philadelphia.
- Day, G.S. (2004), "Invited commentaries on 'evolving to a new dominant logic for marketing': Achieving advantage with a new dominant logic", *Journal of Marketing*, 68(1): p 18-19.
- Eisenhardt, K.M. and Schoonhoven, C.B. (1990), "Organizational growth: Linking founding team, strategy, environment, and growth among U.S. semiconductor ventures, 1978-1988", *Administrative Science Quarterly*, 35(3): p 504-529.
- Eisenhardt, K.M., and Sull, D.N. (2001), "Strategy as simply rules", *Harvard Business Review*, 79(1): p 107-116.
- Fiates, G.G.S., Fiates, J.E.A., Serra, F.A.R and Ferreira, M.P. (2010), "Innovation environment in small technology-based companies", *Journal of Technology Management & Innovation*, 5(3): p 81-95.
- Fjeldstad, Ø.D and Snow, C.C. (2018), "Business models and organization design", *Long Range Planning*, 51(1): p 32-39.
- Geroski, P.A., Mata, J., and Portugal, P. (2010), "Founding conditions and the survival of new firms", *Strategic Management Journal*, 31(5): p 510-529.
- Hedman, J. and Kalling, T. (2003), "The business model concept: Theoretical underpinnings and empirical illustrations", *European Journal of Information Systems*, 12(1): p 49-59.
- Hitt, M.A., Dacin, M.T., Levitas, E., Arregle, J.L. and Borza, A. (2000), "Partner selection in emerging and developed market contexts: Resource-based and organizational learning perspectives", *Academy of Management Journal*, 43(3): p 449-467.
- Hoang, H., and Antoncic, B. (2003), "Network-based research in entrepreneurship: A critical review", *Journal of Business Venturing*, 18(2): p 165-187.
- Hogan, J.E., Lemon, K.N., and Rust, R.T. (2002), "Customer equity management: Charting new directions for the future of marketing", *Journal of Service Research*, 5(1): p 4-12.
- Johnson, M.W., Christensen, C.M. and Kagermann, H. (2008), "Reinventing your business model", *Harvard Business Review*, 86(12): p 57-68.
- Kay, R., Nielsen, S. and Schröder, C. (2019), "Potentially disruptive innovations and business models: (How) do established SMEs respond?", *International Review of Entrepreneurship*, 17(1): p 1-16.
- Kimberly, J.R. (1979), "Issues in the creation of organizations - Initiation, innovation and institutionalization", *Academy of Management Journal*, 22(3): p 437-457.
- Kirchhoff, B.A. and Phillips, B.D. (1988), "The effect of firm formation and growth on job creation in the United States", *Journal of Business Venturing*, 3(4): p 261-272.
- Klang, D., Wallnöfer, M. and Hacklin, F. (2014), "The business model paradox: A systematic review and exploration of antecedents", *International Journal of Management Reviews*, 16(4): 454-478.
- Kogut, B. and Zander, U. (1992), "Knowledge of the firm, combinative capabilities, and the replication of technology", *Organization Science* 3(3): p 383-397.
- Kollmer, H., and Dowling, M. (2004), "Licensing as a commercialisation strategy for new technology-based firms", *Research Policy*, 33(8): p1141-1151.
- Little, A.D. (1979), *New Technology-based Firms in the UK and the Federal Republic of Germany*, London: Wilton House Publications.

- Löfsten, H. (2014a), "Information structures and business performance - Implications for technology-based firm's innovation performance", *Knowledge and Process Management*, 21(4): p 246-259.
- Löfsten, H. (2014b), "Product innovation processes and the trade-off between product innovation performance and business performance", *European Journal of Innovation Management*, 17(1): p 61-84.
- Löfsten, H. (2015), "Critical resource dimensions for development of patents – An analysis of 131 new technology-based firms in incubators", *International Journal of Innovation Management*, 19(1): 1550006.
- Löfsten, H. (2016), "From practice to structures: The link between project-level knowledge creation and firm-level systematic information structures", *Journal of General Management*, 42(1): p 79-100.
- Magretta, J. (2002), "Why business models matter", *Harvard Business Review*, 80(5): p 86–93.
- Markusen, A., Hall, P. and Glasmeier, A. (1986), *High Tech America: The What, How, Where and Why of the Sunrise Industries*, Boston, MA: George Allen and Unwin.
- Mason, K. and Spring, M. (2011), "The sites and practices of business models", *Industrial Marketing Management*, 40: p 1032-1041.
- Meyer, M., De Crescenzo, N. and Russell, B. (2004), "Chemdex: In search of a viable business model", *International Journal of Entrepreneurship Education*, 2(2): p 227-250.
- Monck, C.S.P., Porter, R.B., Quintas, P., Storey, D.J., and Wynarczyk, P. (1988), *Science Parks and the Growth of High Technology Firms*, London: Croom Helm.
- Mithas, S., Krishnan, M.S., and Fornell, C. (2005), "Why do customer relationship management applications affect customer satisfaction?", *Journal of Marketing*, 69(4): p 201–209.
- Morris, M., Schindehutte, M., and Allen, J. (2005), "The entrepreneur's business model: Toward a unified perspective", *Journal of Business Research*, 58(6): p 726–735.
- Najmaei, A. (2014), "Business model theory and research: A philosophical discussion", Entrepreneurship, Start-ups and Small Business Competitive section, conference paper, ANZAM 2014, December 3-5, Sydney.
- Osterwalder, A. and Pigneur, Y. (2010), *Business Model Generation*, Hoboken, NJ: John Wiley and Sons.
- Osterwalder, A., Pigneur, Y., Bernarda, G. and Smith, A. (2014), *Value Proposition Design: How to Create Products and Services Customers Want*, Hoboken, NJ: John Wiley and Sons.
- Palo, T. and Tahtinen, J. (2013), "Networked business model development for emerging technology-based services-", *Industrial Marketing Management*, 42(5), p 773-782.
- Payne, A. and Frow, P. (2005), "Strategic framework for customer relationship management", *Journal of Marketing*, 69(4): p 167–176.
- Pellikka, J.T. and Malinen, P. (2014), "Business models in the commercialization processes of innovation among small high-technology firms", *International Journal of Innovation and Technology Management*, 11(2): 1450007.
- Podsakoff, P.M., and Organ, D.W. (1986), "Self-reports in organizational research: Problems and prospects", *Journal of Management*, 12(4): p 531–544.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., and Podsakoff, N.P. (2003), "Common method biases in behavioral research: A critical review of the literature and recommended remedies", *Journal of Applied Psychology*, 88(5): p 879–903.
- Porter, M.E. (1991), "Towards a dynamic theory of strategy", *Strategic Management Journal*, 12(S2): p 95-117.
- Porter, M.E. (2001), "Strategy and the internet", *Harvard Business Review*, 79(2): p 63-78.
- Priem, R.L., Wenzel, M. and Koch, J. (2018), "Demand-side strategy and business models: Putting value creation for consumers center stage", *Long Range Planning*, 51(1): p 22-31.
- Reymen, I., Berends, H., Oudehand, R. and Stultiëns, R. (2017), "Decision making for business model development: A process study of effectuation and causation in new technology-based ventures", *R&D Management*, 47(4): 595-606.
- Rydehell, H., Isaksson, A. and Löfsten, H. (2019a), "Business networks and localization effects for new Swedish technology-based firms' innovation performance", *Journal of Technology Transfer* 44(5): p 1547-1576.

- Rydehell, H., Isaksson, A. and Löfsten, H. (2019b), "Effects of internal and external resource dimensions on the business performance of new technology-based firms", *International Journal of Innovation Management*, 23(1), 1950001.
- Sadowski, B.M. and Sadowski-Rasters, G. (2006), "On the innovativeness of foreign affiliates: Evidence from companies in the Netherlands", *Research Policy*, 35(3): p 447-462.
- Schumpeter, J.A. (1934), *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*, London: Oxford University Press.
- Stuart, T.B., Hoang, H. and Hybels, R.C. (1999), "Interorganizational endorsements and the performance of entrepreneurial ventures", *Administrative Science Quarterly*, 44(2): p 315-349.
- Szulanski, G., Capetta, R. and Jensen, R.J. (2004), "When and how trustworthiness matters: Knowledge transfer and the moderating effect of casual ambiguity", *Organization Science*, 15(5): p 600-613.
- Teece, D.J. (2010), "Business models, business strategy and innovation", *Long Range Planning*, 43, p 172-194.
- Van Doorn, S., Jansen, J.J.P., Van den Bosch, F.A.J. and Volberda, H.W. (2013), "Entrepreneurial orientation and firm performance: Drawing attention to the senior team", *Journal of Product Innovation Management*, 30(5): p 821-836.
- Wennberg, K. (2005), "Entrepreneurship research through longitudinal databases: Measurement and design issues", *New England Journal of Entrepreneurship*, 8(2): p 9-19.
- Yagüe-Perales, R.M. and March-Chorda, I. (2013), "Performance analysis of NTBFs in knowledge-intensive industries: Evidence from the human health sector", *Journal of Business Research*, 66(10): p 1983-1989.
- Yli-Renko, H., Autio, E. and Sapienza, H.J. (2001), "Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms", *Strategic Management Journal*, 22(6-7): p 587-613.
- Zablah, A.R., Bellenger, D.N. and Johnston, W.J. (2004), "An evaluation of divergent perspectives on customer relationship management: Towards a common understanding of an emerging phenomenon", *Industrial Marketing Management*, 33(6): p 475-489.
- Zhou, K.Z. (2006), "Innovation, imitation and new product performance: The case of China", *Industrial Marketing Management*, 35(3): p 394-402.
- Zott, C., and Amit, R. (2007), "Business model design and the performance of entrepreneurial firms", *Organization Science*, 18(2): p 181-199.
- Zott, C., Amit, R. and Massa, L. (2011), "The business model: Recent developments and future research", *Journal of Management*, 37(4): p 1019-1042.