Chapter 8
Barriers to Business Model Innovation: Insights from SMEs in Switzerland

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Abstract Business model innovation (BMI) has become increasingly important in recent years, but the question remains as to why only a small number of companies are doing it. In addition, the rate of companies innovating in general is decreasing in Switzerland, especially among small and medium-sized enterprises (SME). Therefore, the aim of this study was to investigate the barriers to business model innovation among small and medium-sized enterprises in Switzerland. A quantitative approach with a written survey sent to 4000 companies was adopted. A sample of 405 company managers from the Swiss canton of Schwyz responded. The data were statistically analysed using SPSS.

The results show that medium-sized companies and those in high-tech sectors are more likely to engage in business model innovation. In contrast, smaller companies and those in less technical sectors face more challenges. The analysis identified seven barriers to BMI that are significant. Two barriers turned out to be triggers for BMI rather than actual obstacles. Past barriers were more intrinsic, related to diversity, risk aversion and own expertise. For current BMI plans, the most relevant barriers are more likely to be related to cost, technology and capacity. Additionally, the relevance of BMI may increase as companies focus on data and digital business models. These findings can assist companies in identifying and overcoming barriers in the innovation process. Furthermore, organisations such as economic development agencies or higher education institutions can adapt their services to better support SMEs in overcoming these barriers and fostering innovation.

Keywords Business model innovation · Innovation barriers · Small and medium sized companies · Quantitative research - Switzerland

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Introduction

Entrepreneurial success is an important factor in sustainable economic development, which ultimately benefits society as a whole. In the long term, it promotes economic stability, creates jobs and fosters innovation, all of which contribute to a thriving economy. When businesses are successful, they are more likely to invest in sustainable practices, provide support for community development and drive social progress. Therefore, a company's ability to be entrepreneurial and innovate supports the broader objective of sustainable development and societal well-being (Acs et al., 2013; Huđek & Hojnik, 2020; Porter & Kramer, 2011).

In this context, innovating business models (BMI) is also crucial for the long-term success of companies in a constantly changing economic environment (Bereznoi, 2015). In an era of rapid technological advancement and increasing market dynamics, companies must continuously adapt and innovate their business models in order to remain competitive (Bashir & Verma, 2017). Technological developments such as digitalisation, artificial intelligence and the Internet of Things are constantly opening up new opportunities and challenges that require a flexible and innovative approach to business models. This is not just about optimising existing models, but also about finding completely new ways to create and deliver value.

Despite the obvious need for innovation, many companies face significant barriers to implementing new business models. These barriers can be very diverse and include, for example, organisational, institutional and technological challenges as well as external market conditions. Organisational barriers can include resistance to change, inadequate organisational learning mechanisms and lack of innovation capabilities (Rüb et al., 2017). Institutional barriers often concern the willingness to take risks and the culture of innovation within the company (Bocken & Geradts, 2020). Technological barriers can include difficulties in integrating new technologies and adapting existing systems (Mosig et al., 2021). In addition to these internal challenges, external market conditions also play a role. External barriers include market conditions, regulatory restrictions or supply chain issues (Guldmann & Huulgaard, 2020).

In Switzerland, the number of companies engaged in innovation has fallen significantly over the past 20 years. This is particularly true for SMEs, where the number has halved (SBFI, 2020). Furthermore, BMI is only carried out by a minority of companies (Meyer & Meyer, 2020). A previous study found that knowledge of BMI is insufficient and thus acts as one possible barrier, but left open the question of why 56% of companies that claim to have no difficulty in innovating have not innovated in the last 10 years and why the number of innovative companies is declining sharply (Meyer et al., 2023). By focusing on one Swiss canton, this study aims to identify and analyse the current barriers to business model innovation, with an additional focus on big data as part of digitalisation and a possible enabler of innovation (SBFI, 2020). The findings will help companies to overcome these challenges and successfully implement innovative business models. The following research questions will be answered:

- Q1: What is the current status of the planned BMI projects?
- Q2: Why was there no investment in more business model innovation in the past?
- Q3: Are today's barriers different from those of the past?
- Q4: Does the use of big data, or lack thereof, have an impact on business model development?

This chapter is divided into five more sections. Firstly, the known barriers to BMI are identified and a theoretical framework developed that was used for the survey. Section "Methods" described the methodology in collecting and analysing the data. Section "Results" presents the results and defines the barriers to BMI. The final two sections discuss the results considering the current literature and conclude the chapter with further research directions and limitations.

Literature Review

Business Model Innovation

With regard to the multidimensionality of BMI, there are different definitions in the research landscape, with a lack of consensus (Bashir et al., 2020). According to Teece (2010), business model innovation (BMI) entails rethinking and redesigning how a business creates, delivers, and captures value. This can involve launching innovative products or services, tapping into new markets, or using technology to enhance existing business processes. Similarly, Euchner and Ganguly (2014) highlight that BMI is a strategic redesign of a firm's value proposition, the way it creates value, and how it captures value in the market. Business model innovation can be incremental, involving minor adjustments, or radical, involving a significant overhaul of a company's business structure (Souto, 2015). Incremental innovation focuses on improving existing processes, while radical innovation often leads to entirely new ways of conducting business (Souto, 2015).

A common differentiation in the definition is between single and multi-dimensional changes. For example, one definition focuses on Osterwalder's business model canvas and argues that a BMI already happens when a company innovates in at least one of the nine aspects; thus, multi-dimensionality is not taken into account (Rüb et al., 2017). For this paper we define a business model in terms of four dimensions: customers, value proposition, value chain and profit mechanism. A BMI, according to this definition, changes at least two of these four dimensions and thus allows the company to define new rules in the market (Philippi & Hinz, 2018). This allows a clear differentiation from other types of innovation, such as product or process innovation. Thus, the definition that was also given to the survey participants was the following:

> A business model innovation changes at least two of the four dimensions: customer base, value proposition, value chain and revenue model. This allows the company to define new rules in the market. Key aspects are, for example, the novelty of the business model, the

> barriers to change for the customer, or the efficiency of the company's own processes or organisation. The advantage of business model innovation is that the long-term positive effect for the company is greater than with individual product or process innovations.

Bashir et al. (2020) identified five key aspects around business model innovation: triggers, barriers, enablers, dimensions and outcomes. This paper focuses solely on the aspect of the barriers, meaning the factors that hinder a business model innovation at all possible stages.

The use of big data is becoming increasingly important for companies, especially due to the increasing availability of a wide variety of data and its significant impact on the value chain (Matzler et al., 2018). Big data refers to very large and complex datasets that are difficult to process and analyse using traditional data processing tools and techniques. These datasets can come from various sources, such as company specific devices and sensors, social media, geolocation data or transactions (Chaudhary et al., 2015). Big data has started in IT, but is now used more for business transformation, where its application has helped businesses to succeed (Chaudhary et al., 2015). There is an opportunity to design BMI around the collection, analysing and interpretation of external as well as internal data (Sorescu, 2017). The question of associated BMIs therefore also arises for small and medium-sized enterprises, especially as BMI itself is also becoming increasingly important across sectors (Philippi et al., 2022) and, in the context of big data, is also related to the aforementioned Q4.

Barriers to Business Model Innovation

Research has shown different barriers to business model innovation. Chesbrough (2010) in his influential work states that the biggest barrier to BMI is resistance to change within the organisations. The Swiss State Secretariat for Education, Research and Innovation identifies the three main barriers to innovation as "*high costs*, *lack of own funds* and *shortage of skilled workers"* (Spescha & Wörter, 2020). Also, Morabito (2015) and Friedrich von den Eichen et al. (2015), in partial agreement with the SBFI report and Chesbrough, identify the biggest BMI innovation barriers as lack of awareness of BMI, entrenched thinking (need not seen), bureaucratic hurdles in internal processes, lack of consideration of the customer perspective, lack of expertise, cultural differences, organisational structure and technological maturity. As these examples show, there are different hurdles concerning various areas of a company.

Bashir et al. (2020) have identified six categories of barriers in their systematic literature review. Table 8.1 shows the categories and the possible barriers identified in research for each category.

From these barriers, the theoretical framework at the end of this section has been developed.

Table 8.1 Barriers to business model innovation structured into six categories (Bashir et al., 2020; Chesbrough, 2010; Foss & Saebi, 2016; Lopez et al., 2019; Morabito, 2015; Spescha & Wörter, 2020; Friedrich von den Eichen et al., 2015)

Category	Barriers
Cognitive	• Lack of know-how and awareness • The need is not seen • Complexity of business models • Risks are higher than the cost
Organizational	• Organizational resistance • Bureaucratic hurdles of internal processes • Lack of expertise • Fully occupied by day-to-day-business
Institutional	• Business strategy • Lack of funds • High cost of innovation • Shortage of skilled workers • Cultural differences
Market	• Lack of information • Monopolies • Relative cost of labor • Too complex customer base • Customers are not open to new developments • Market does not allow adjustments
Behavioral	• Lack of perceived control • Lack of attention
Technological	• Technical know-how • Cost of technological solutions

Context Business Landscape Canton Schwyz

The survey was conducted in the Swiss canton of Schwyz. Schwyz is a small canton with slightly above 160′000 inhabitants. 5% work in the primary economic sector, 25% in the secondary and 70% in the third sector, offering services (Federal Statistical Office, 2024). The canton has 20′600 registered companies, the majority of which are micro companies with less than 10 employees (Kanton Schwyz, 2023). Considering the nature of the company sample for the canton of Schwyz, the further reflections and the empirical analysis are focused on SME's and services.

Heikkilä introduces three types of SMEs (Heikkilä et al., 2017) with different focus on specific BMI activities, respectively business model dimensions according to Philippi & Hinz (2018). Firstly, there are the profitability seekers (Heikkilä et al., 2017), who focus on value chain and yield mechanics. They begin with reducing costs and enhancing the effectiveness and efficiency of their main operations and assets. Following this, they attempt to optimize their pricing strategies. Eventually, the attention shifts from internal improvements to a stronger customer orientation, aiming to update their offerings. This shift may result in changes to the value chain. Secondly, the growth seekers have the customers and the value proposition at their core (Heikkilä et al., 2017). They initially concentrate on their existing customers in

the existing markets. Subsequently, they work on enhancing their offerings in the current markets or on exploring other markets including going international. The subsequent steps involve identifying potential partners and the appropriate channels to serve these additional customers. Their primary focus remains on the customer side. And the third category are new business starters that look at all four dimensions of the business model, namely customers, value proposition, value chain and yield mechanics (Heikkilä et al., 2017). They cyclically build their business model, covering most components by analysing and testing its viability. They focus on improving the entire business model rather than just a few components. In the early stage, they rely on a few first movers and maintain agility to serve them effectively.

As indicated in the report published by the Swiss State Secretariat for Education, Research and Innovation (SBFI, 2020), the service industry is characterised by significant heterogeneity, which presents a challenge in identifying shared characteristics of innovation activities within this sector. Nevertheless, the following four characteristics appear to be common to a significant proportion of service businesses:

- The subordinate role of research and development as a source of innovation. In many service industries, the development of new practical solutions is not a primary objective; rather, the focus is on providing new instruments to offer services to customers.
- For the vast majority of service providers, the use of information and communication technology is important. It now plays a much more important role within the service sectors. The realisation of opportunities associated with it depends, however, on several factors that determine success. Nevertheless, the development and adaptation of some intangibles (such as human capital, organisational structures, and business models) is crucial to fully exploit the productivity potential of information and communication technology.
- Innovation in services largely involves new business models and is mostly focused on changing organisations and processes.
- The demand side and thus the users of the innovations play an increasingly important role in their development and implementation.

In addition to the similarities a very important difference exists comparing traditional and modern services. The latter require to a certain extent the building of expert knowledge that must be maintained and updated in order to have a competitive advantage. Consequently, modern services can be classified as so-called Knowledge-Intensive-Services (KIS).

Knowledge has become a decisive competitive factor for modern services (SBFI, 2020). Successful companies no longer primarily produce and sell physical products, but respond to their customers' needs and solve their problems with highly functional and intelligent products. In this process, knowledge becomes the most important production factor. KIS have specific characteristics that distinguish them from other services: they use cumulative learning processes with their customers, e.g. co-creation or co-invention. The solutions developed in this way are tailor-made and cannot be easily reproduced. An important prerequisite for success in this

process is mutual trust between the service provider and the customer. The exchange between them gives the service provider access to sensitive, business-relevant knowledge of the customer (SBFI, 2020). Using this knowledge, the literature indicates that SMEs can enhance their performance by engaging in BMI (Andersen et al., 2022). However, SMEs often fail to realise the impact due to limited resources, financially and personnel-wise, which limit their abilities.

Theoretical Framework

In summary, it is to be expected that a certain reluctance towards BMI will be observed, due to the size of the companies represented in the sample. This may also have an impact on the answers provided to questions Q1 and Q2. The specific obstacles to innovation may vary depending on the selected route (profitability, growth, or new business) and the degree of emphasis placed on knowledge (KIS) and data affinity. These factors could influence the responses to questions 3 and 4. The barriers identified in Table 8.1 were adapted into a theoretical framework for use in a questionnaire. Also, the SME type, KIS focus and data affinity were added to the framework.

Table 8.2 illustrates the theoretical framework with the anticipated linkage of innovation barrier to SME Type, KIS Focus and Data Affinity.

The assessments of SME type, KIS focus and data affinity were made by the authors of this paper based on their descriptions as explained in the literature above.

Table 8.2 Theoretical framework: anticipated linkage of innovation barrier to SME Type, KIS Focus and Data Affinity (own illustration)

Linking barriers to SME type, KIS focus and data affinity			
Barrier	SME type	KIS focus	Data affinity
We see no need for an adjustment.	No BMI interest	No	No
Our employees are sceptical about new things.	Profitability	No	No
Our teams are too culturally diverse.	Profitability	Yes	Yes
We invest cautiously because of the high costs.	Profitability	Yes	Yes
We do not have the own funds.	All	Yes	No
The risks do not justify the expected benefits.	Growth	No	Yes
We lack the expertise in implementation.	New Business	Yes	Yes
We do not have the necessary technology.	New Business	Yes	Yes
We are fully occupied with the day-to-day business.	All	No	No
Our internal processes are complex.	Profitability	Yes	No
Our internal structure is complex in design.	New Business	No	Yes
Our customer base has a complex structure.	Growth	Yes	No
Our customers are sceptical about new things.	Growth	No	No
The market does not allow any adjustment.	Growth	No	No

Methods

Sample and Data

The survey sample initially comprised 4000 companies, spanning various sizes and industries in the canton of Schwyz. The dataset was obtained from the Swiss Federal Statistical Office, which provided a random sample from the company register. Due to ongoing liquidations, the number of addressed companies was reduced to 3947. Additionally, 104 companies were excluded due to undeliverable mailings, resulting in a final count of 3843 contacted businesses. Table 8.3 shows survey sample data.

The survey received 405 analysable responses, which equals to a response rate of 10.54%. In terms of response methods, the survey used both online and postal channels. Of the 405 usable responses, 133 were submitted online and 272 were received by traditional mail. In the following sections of this paper, if the number of responses (N) is less than 405, it means that a subset of respondents did not respond to that particular question. However, they did respond to the other questions, so that the overall feedback can be analysed with a 95% confidence level and a 5% margin of error (in this case, the minimum is 350).

Measures of Variables

The survey was developed based on the literature and the framework developed in Table 8.1. The data were measured using a mix of questions. On the one hand there were simple yes/no, single and multiple choice questions. On the other hand, there were some Likert scale questions with a choice on a scale from agree to disagree. At the beginning, participants were asked if they knew what BMI was. This was

Table 8.3 Survey sample data (own data)

Survey sample	
Companies in the sample	4000
Ongoing liquidations	−53
Addressed companies	3947
Undeliverable mailings	−104
Contacted companies	**3843**
Analysable responses	**405**
Response rate (Analysable responses/contacted companies' ratio)	**10.54%**
Online responses	133 (32.84%)
Mail responses	272 (67.16%)

followed by a definition of BMI to ensure that all participants answered the subsequent questions with the same knowledge. The same approach was used for the application of big data. Participants were given a definition before being asked if they use big data.

Statisical Analysis

Participants in the quantitative survey could respond online via QR code or URL or by returning a paper questionnaire using a provided envelope. The responses from both channels were combined into a single raw data file for further analysis.

The following statistical methods were applied to analyse the collected data using IBM SPSS Statistics: bivariate logistic regression, crosstabulation (Pearson's Chi-Square) as well as rank correlation (Spearman's Rho) (Field, 2017). To ensure the correct application of these methods, several variables underwent data transformations to meet the requirements of the selected statistical techniques.

Company Categories

To get meaningful results two classifications were made in the preparation of the survey. On the one hand, the company sizes were classified according to the definition of the European Commission, without looking at financial data, focusing only on the number of employees (European Commission, 2023). Table 8.4 shows the company size classification.

On the other hand, the industries were grouped following the definitions of the Swiss State Secretariat for Education, Research and Innovation (SBFI, 2020):

Low-tech industry:

Food, beverages and tobacco/Textiles, clothing and leather/Wood, paper and printed products/Coke and refined petroleum products/Glass and glass products, ceramics, processing of stones and earths/Metal production/Metal products/Equipment, articles for the installation and repair of machinery.

High-tech industry:

Chemicals, pharmaceuticals/Rubber and plastic products/Data processing equipment, electronic and optical products (including watches and electromedical

Table 8.4 Company size classification (own data)

Company size by number of employees	
Micro	1–9
Small	10–49
Medium-sized	50–249
Big	250 and more

equipment)/Electrical equipment/Mechanical engineering vehicles (including motor vehicles).

Traditional services:

Wholesale and retail trade, sale, and repair of motor vehicles/Transport (freight and passenger) and warehousing/Postal services/Hotels and restaurants/Craft/Cleaning.

Modern services:

Publishing (including software publishing), production and broadcasting of audio-visual content, telecommunication content, telecommunications, information services (including programming and consulting, accommodation and data analysis)/Financial, insurance and reinsurance services (including pension funds)/Professional services in the profession of law, accounting and consulting/Rental and leasing services (including vehicles and private accommodation)/Booking services/Marketing services/Administrative support services/Architectural and engineering activities/Scientific and R&D activities/Therapeutic services.

Energy:

Electricity, gas, water supply, sewerage, and waste management services.

Construction:

All activities in building construction, civil engineering, and specialised construction activities.

Results

The following chapter shows the results of the survey.

Demographics and Outlook

Two thirds (77%) of the responding business owners own micro enterprises with less than 10 employees (including one-person enterprises), as shown in Fig. 8.1. The remaining third are between small and medium-sized enterprises. In summary, most enterprises surveyed are micro, while medium-sized enterprises with more than 49 employees are the least common in the sample. Companies with more than 250 employees were excluded from the sample. Figure 8.2 shows the distribution of various industry sectors among the sample. The largest sector is modern services (33%), followed by traditional services (29%) and construction (23%), while energy is the least represented sector in the sample. This means that approximately 85% of the enterprises in the sample provide services to their clients if construction is included. Figure 8.1 illustrates the company size distribution in the sample, and Fig. 8.2 shows the industry distribution in the sample. Figure 8.3 illustrates the turnover trend in the sample of companies, and finally, Fig. 8.4 shows the profit trend in the sample of companies.

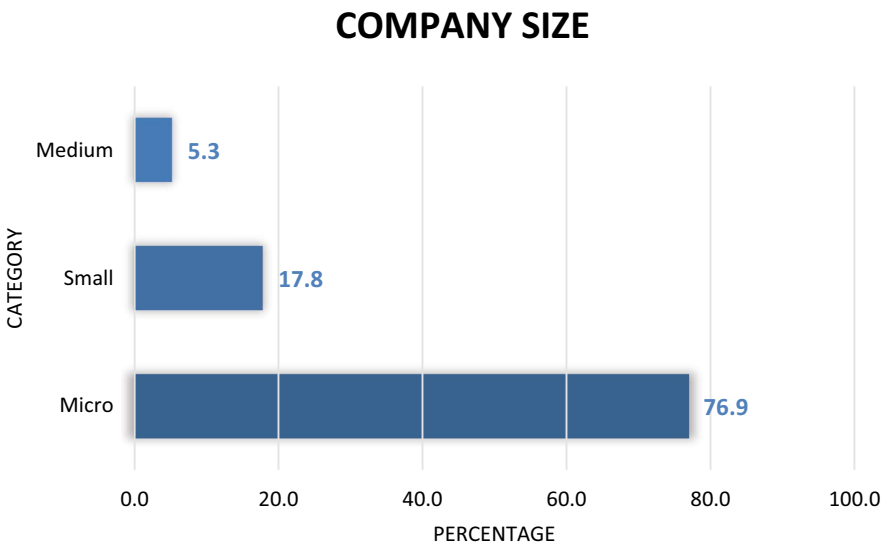

Fig. 8.1 Company size distribution in the sample (N = 398, own data)

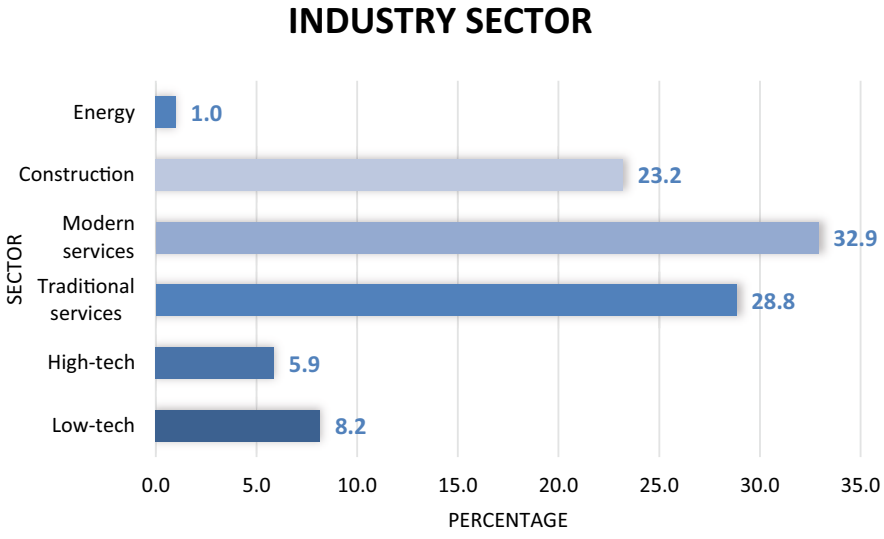

Fig. 8.2 Industry distribution in the sample (N = 392, own data)

As shown in Fig. 8.3, 6% of company managers expect a strong increase in turnover and 42% an increase, which means that in total almost half of the companies in the canton of Schwyz expect to expand their business over the next 2 years. A further 41% do not expect a decline, as they do not anticipate any change from today. Only 11% expect their business to deteriorate. Figure 8.4 shows that most

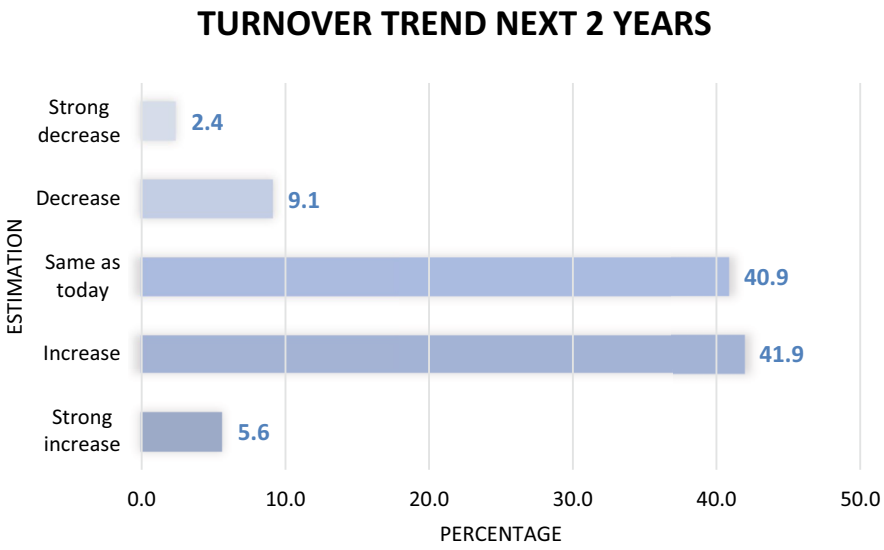

Fig. 8.3 Turnover trend in the sample of companies (N = 372, own data)

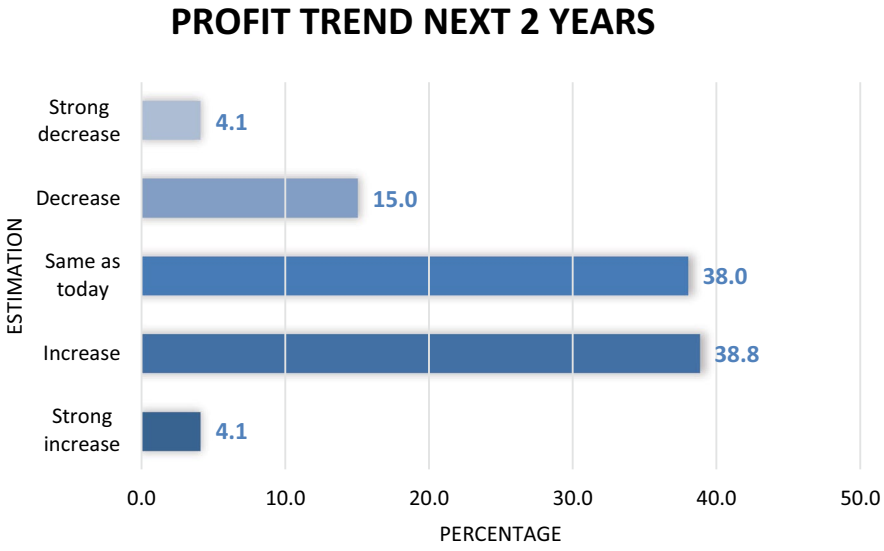

Fig. 8.4 Profit trend in the sample of companies (N = 366, own data)

respondents expect their profits to increase significantly (4%), increase (39%) or remain the same (38%) over the next 2 years. 4% expect a strong decrease in profits and 15% expect a decrease. Overall, the data suggest a generally stable to slightly positive outlook for the next 2 years. However, not all businesses expect to benefit

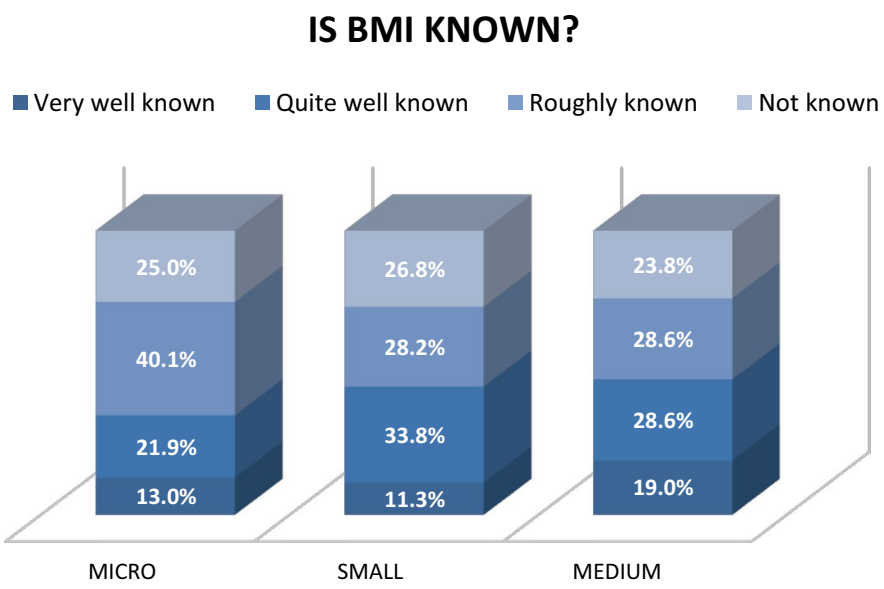

Fig. 8.5 BMI knowledge related to size (N = 384, own data)

from the positive sales situation, as the proportion of those expecting a fall in profits is higher than the proportion expecting a fall in sales.

Figure 8.5 illustrates the BMI knowledge related to size, and Fig. 8.6 shows BMI knowledge related to industry.

Based on the data in Fig. 8.5, in each company size category there are approximately 25% of the company managers who are not familiar with BMI. For the remaining 75%, the proportion of managers that either "very well" or "quite well" know BMI increases with the company size. Figure 8.6 shows the distribution of knowledge of BMI across industries. The proportion of executives who know BMI "very well" or "quite well" is highest in the energy and high-tech sectors. Conversely, knowledge of BMI is lowest in the construction and low-tech sectors. Traditional and modern services have mixed levels of awareness, with traditional services tending to have more limited knowledge.

RQ1: What is the current status of the planned BMI projects?

The data suggest that the likelihood of undergoing a BMI within the next 2 years increases with the size of the enterprise. Small companies are more likely to have no innovation or only a single innovation, such as a product or process innovation. Table 8.5 illustrates the proportion of BMI planned within next 2 years related to size.

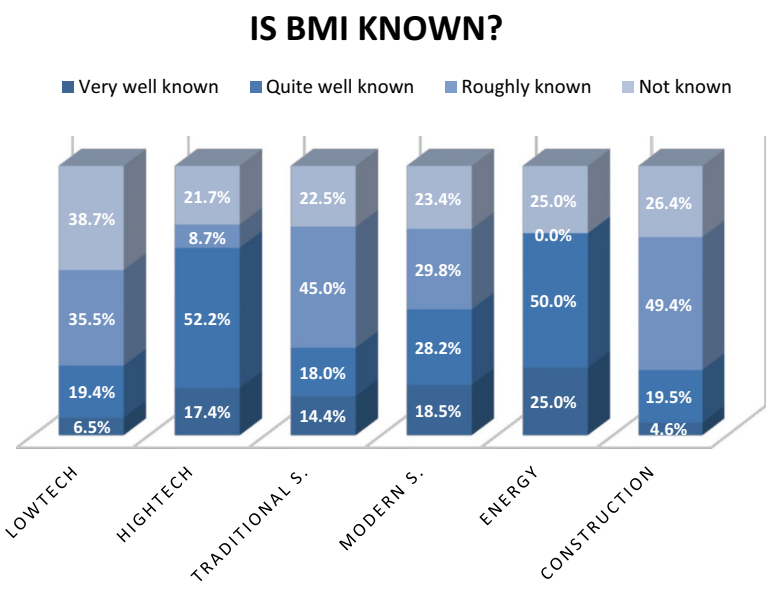

Fig. 8.6 BMI knowledge related to industry (N = 380, own data)

Table 8.5 Proportion of BMI planned within next 2 years related to size [N = 385] (own data)

Will a BMI be done within the next 2 years?	No innovation	Single innovation	Multiple innovations (BMI)
Micro	30.4%	31.7%	*37.9%*
Small	16.9%	26.8%	*56.3%*
Medium	4.8%	4.8%	*90.5%*

As Table 8.6 shows, the high-tech sector has the highest likelihood of undergoing a BMI within the next 2 years, followed by the energy and low-tech sectors. The construction sector has the lowest probability of doing a BMI, but the second highest probability for a single innovation such as a product or process innovation. Table 8.6 shows proportion of BMI planned within next 2 years related to industry.

In this context, it is interesting to see whether companies that have undergone a BMI in the last 10 years are likely to do so again in the next 2 years. Therefore, Spearman's Rho can be used to show the degree of association between two ordinal variables that are not equally spaced, without having to look at the distribution of the data. These variables are BMI performed in the last 10 years and intention to have another BMI in the near future (next 2 years).

Table 8.7 shows the rank correlation (Spearman's Rho) for BMI done in the past related to BMI planned in the future.

Spearman's Rho (Table 8.7) shows a correlation coefficient between these two variables of 0.542, indicating a positive, moderate correlation. This means that as the frequency of having had a BMI in the last 10 years increases, so does the

Table 8.6 Proportion of BMI planned within next 2 years related to industry [N = 381] own data

Will a BMI be done within the next 2 years?	No innovation	Single innovation	Multiple innovations (BMI)
Low-tech	29.0%	22.6%	*48.4%*
High-tech	4.5%	18.2%	*77.3%*
Traditional services	27.9%	28.8%	*43.2%*
Modern services	24.0%	33.6%	*42.4%*
Energy	50.0%	0.0%	*50.0%*
Construction	33.0%	30.7%	*36.4%*

Table 8.7 Rank Correlation (Spearman's Rho) for BMI done in the past related to BMI planned in the future (own data)

Spearman's Rho		Was a BMI done within the last 10 years?	Will a BMI be done within the next 2 years?
Was a BMI done within the last 10 years?	Correlation Coefficient	1	0.540
	Sig. (2-tailed)		0.000
	N	386	385
Will a BMI be done within the next 2 years?	Correlation Coefficient	0.540	1
	Sig. (2-tailed)	0.000	
	N	385	386

probability of having a BMI in the next 2 years and vice versa. The Sig. (2-tailed) value of 0.000 indicates that the correlation is statistically significant. Thus, there is a statistically significant, moderate positive correlation between having done a BMI within the last 10 years and the likelihood of having a BMI being done within the next 2 years.

RQ2: Why was there no investment in more business model innovation in the past?

In the survey, managers were presented with 14 different potential barriers to innovation, each assumed to be independent of the others. They were asked to judge whether or not they could lead to a blockage of innovation-related activities in their companies. Table 8.8 shows the occurrence of a BMI within the last 10 years related to potential BMI barriers.

The following barriers have a significant negative relationship with the outcome, suggesting that organisations with these beliefs are less likely to have conducted a BMI in the last 10 years:

- "We see no need for an adjustment."
- "The risks do not justify the expected benefits."

Table 8.8 Occurrence of a BMI within the last 10 years related to potential BMI barriers (own data)

Logistic Regression: Was a BMI done within last 10 years?	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.f or EXP(B) Lower	Upper
We see no need for an adjustment.	***−1.016***	0.248	16.814	1	***0.000***	0.362	0.223	0.589
Our employees are sceptical about new things.	0.162	0.321	0.254	1	0.614	1.176	0.626	2.208
Our teams are too culturally diverse.	***0.784***	0.399	3.869	1	***0.049***	2.191	1.003	4.788
We invest cautiously because of the high costs.	−0.106	0.282	0.141	1	0.708	0.900	0.517	1.564
We do not have the own funds.	0.018	0.288	0.004	1	0.951	1.018	0.579	1.788
The risks do not justify the expected benefits.	***−0.658***	0.294	4.992	1	***0.025***	0.518	0.291	0.922
We lack the expertise in implementation.	***−0.640***	0.316	4.087	1	***0.043***	0.528	0.284	0.981
We do not have the necessary technology.	0.262	0.326	0.648	1	0.421	1.300	0.686	2.461
We are fully occupied with the day-to-day business.	−0.266	0.290	0.839	1	0.360	0.767	0.434	1.354
Our internal processes are complex.	0.326	0.320	1.038	1	0.308	1.385	0.740	2.592
Our internal structure is complex in design.	−0.182	0.430	0.179	1	0.673	0.834	0.359	1.936
Our customer base has a complex structure.	0.111	0.326	0.116	1	0.734	1.117	0.590	2.118
Our customers are sceptical about new things.	0.320	0.309	1.075	1	0.300	1.377	0.752	2.521
The market does not allow any adjustment.	***−1.111***	0.358	9.646	1	***0.002***	0.329	0.163	0.664
Constant	1.221	0.284	18.484	1	0.000	3.390		

- "We lack the expertise in implementation."
- "The market does not allow any adjustment."

The other barriers do not show a significant relationship with the dependent variable of having done a BMI, because their Sig. values are above the conventional threshold of 0.050. The cultural diversity has a significant positive relationship with the outcome, indicating that organisations with diverse teams are more likely to have had a BMI in the past than organisations with a more homogeneous culture. Figure 8.7 illustrates the adjustment barrier related to size, and Fig. 8.8 shows the adjustment barrier related to industry.

Figure 8.7 shows that the perceived need for adjustment of the business model increases with the company size by disagreeing to the statement "We see no need for an adjustment". This suggests that the micro-sized companies are more reluctant

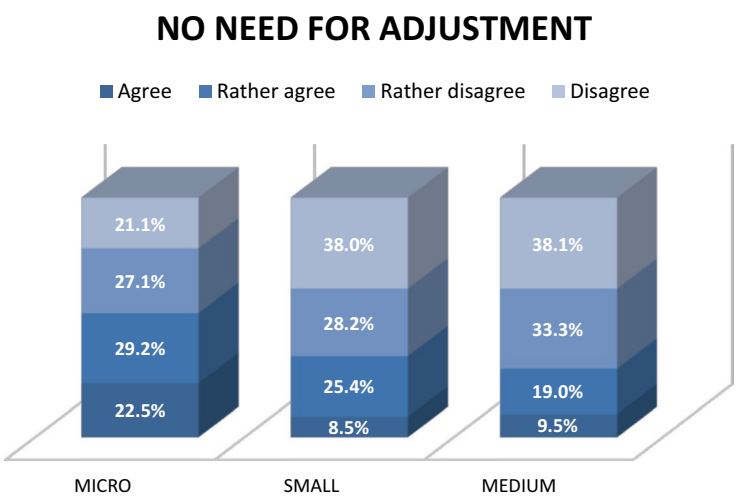

Fig. 8.7 Adjustment barrier related to size (N = 376, own data)

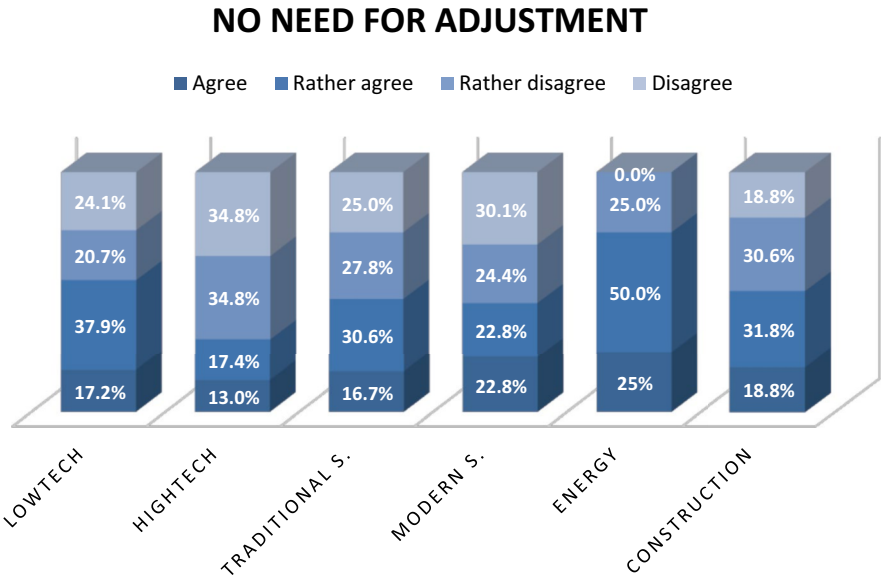

Fig. 8.8 Adjustment barrier related to industry (N = 372, own data)

to innovate their business model, while the medium-sized companies see the value of this activity. As per Fig. 8.8, the high-tech industry has the highest proportion of respondents who either disagree or rather disagree with the statement (69.6% combined), suggesting a more significant perceived need for adjustments in this sector. The modern services industry has the most evenly distributed responses with no

clear consensus on the need for adjustments. The low-tech, traditional services, and construction industries have mixed opinions, with a slight majority leaning towards not needing adjustments. Figure 8.9 illustrates the cultural barrier related to size, and Fig. 8.10 shows the cultural barrier related to industry.

Related to the company size (Fig. 8.9), there is a notable shift from "disagree" to "rather disagree" with the increase of the company size. This may be related to a greater awareness of diversity, which leads to a more cautious approach to the question. However, the proportion of agreement does not change to the same extent, as it almost does not change at all. As per Fig. 8.10, low-tech, construction and traditional services, which are well represented in the sample, have slightly higher level of agreement than the other industries. High-tech and modern services may be exposed to more cultural diversity due to the international business environment.

Figure 8.11 illustrates the risk barrier related to size, and Fig. 8.12 shows the risk barrier related to industry.

The belief that the risks do not justify the expected benefits decreases slightly with company size, as the level of disagreement with this statement increases with company size. This implies that organisations that agree with the statement 'The risks do not justify the expected benefits' are less likely to have undergone a BMI in the past, with the micro enterprises being the most reluctant to innovate their business model based on risk-benefit analysis. As shown in Fig. 8.12, this result is similar for the energy, traditional services and construction sectors, as a larger proportion of respondents agree or rather agree that the risks do not justify the expected benefits and therefore the companies have not undergone a BMI in the last 10 years, as implied by the negative statistical significance in Table 8.5.

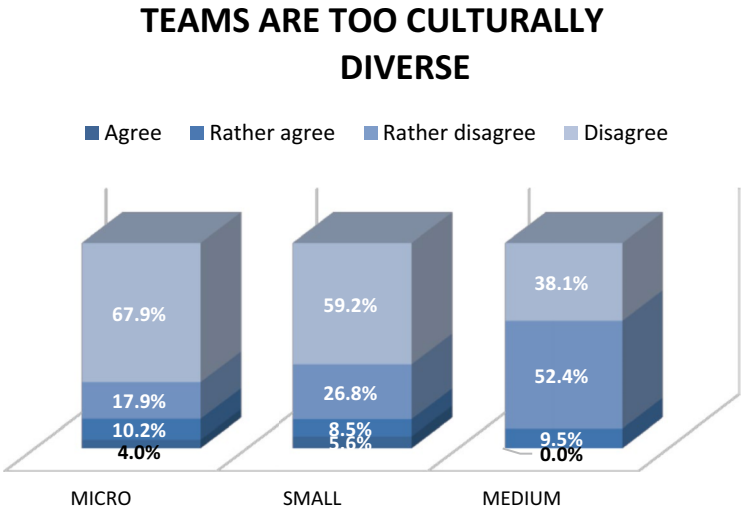

Fig. 8.9 Cultural barrier related to size (N = 366, own data)

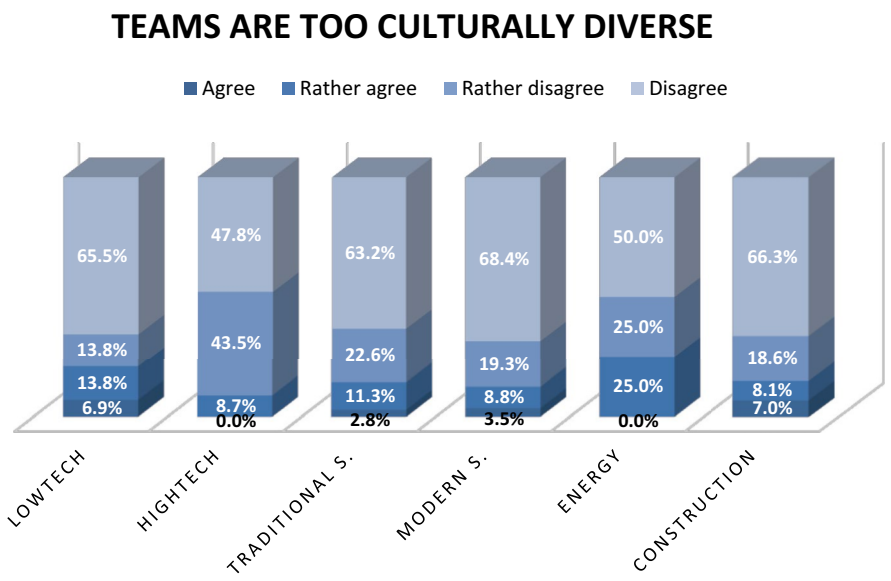

Fig. 8.10 Cultural barrier related to industry (N = 362, own data)

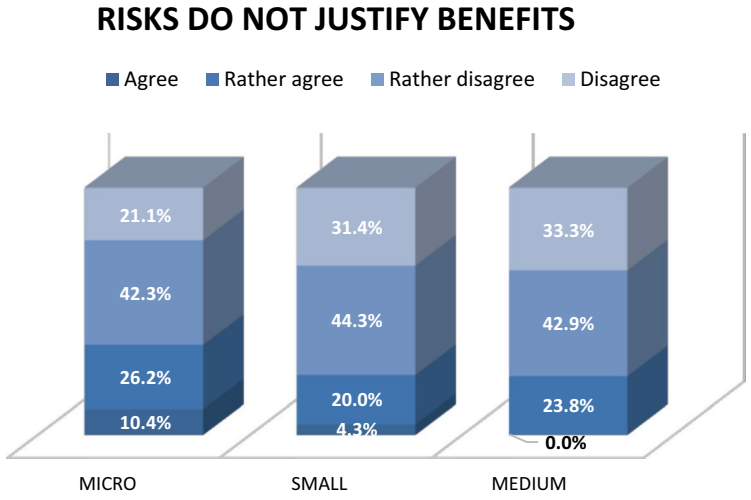

Fig. 8.11 Risk barrier related to size (N = 370, own data)

Figure 8.13 illustrates the expertise barrier to size, and Fig. 8.14 shows the expertise barrier related to industry.

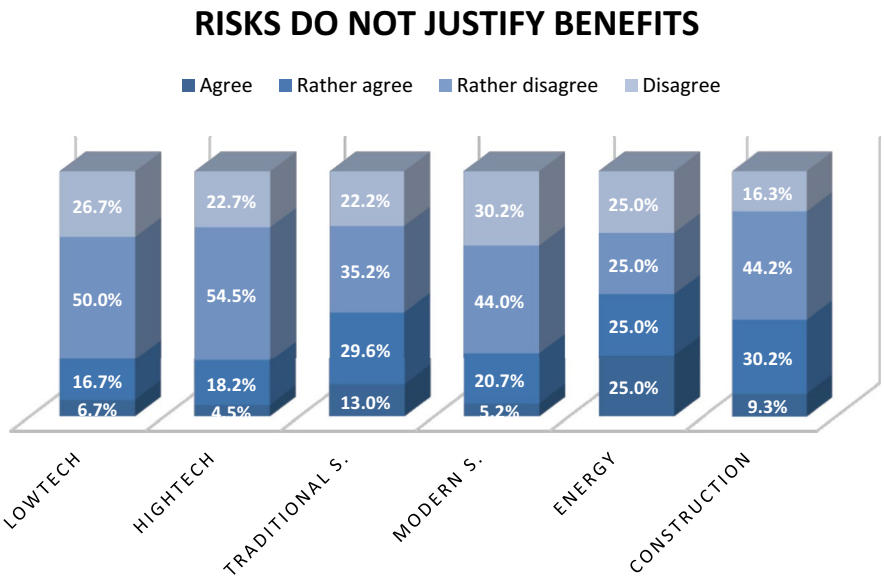

Fig. 8.12 Risk barrier related to industry (N = 366, own data)

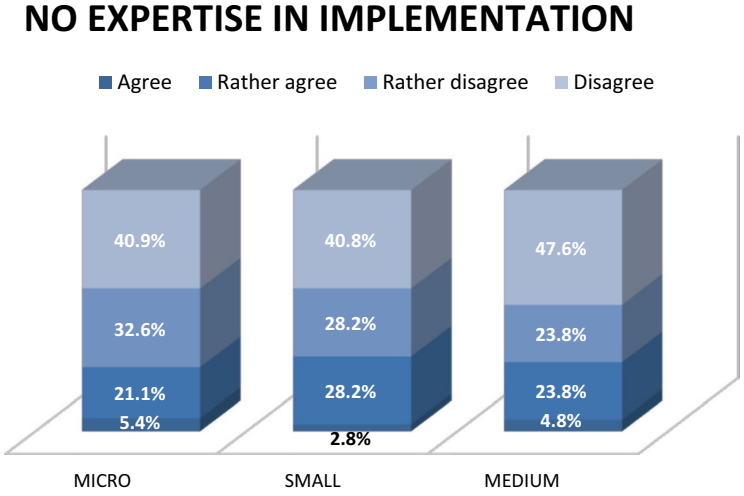

Fig. 8.13 Expertise barrier related to size (N = 371, own data)

Based on the data in Figs. 8.13 and 8.14, it appears that approximately 25–30% of the respondents agree or rather agree to the lack of expertise in implementation across all company sizes and industries, which may overlap to a certain extent with the proportion of respondents not knowing BMI across all industries as per Figs. 8.5 and 8.6.

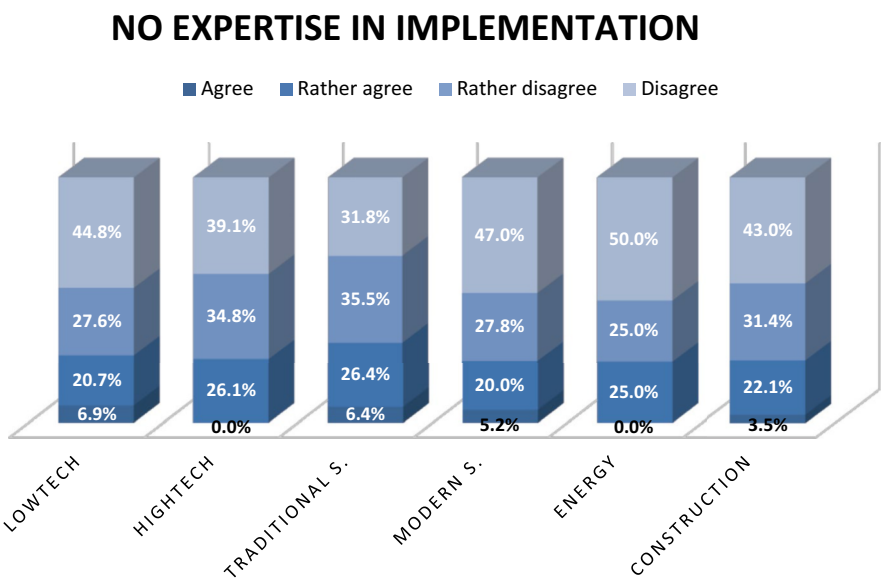

Fig. 8.14 Expertise barrier related to industry (N = 367, own data)

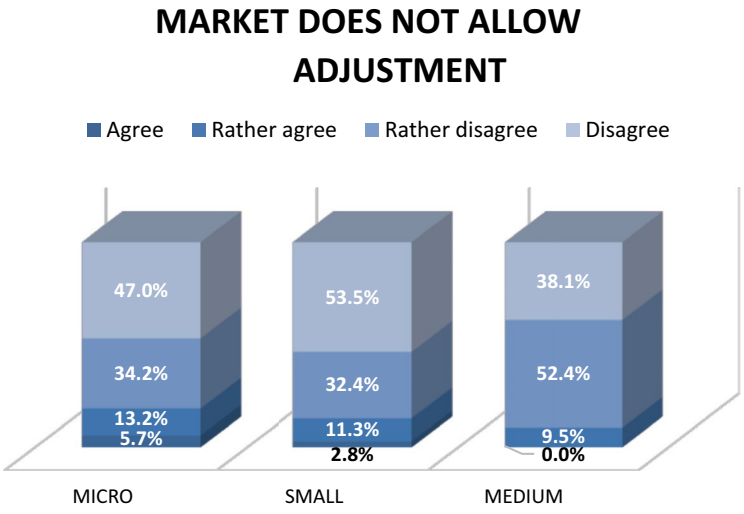

Fig. 8.15 Market barrier related to size (N = 373, own data)

Related to the barrier "The market does not allow an adjustment" the data is as follows in Figs. 8.15 and 8.16:

The data in Figs. 8.15 and 8.16 shows a big proportion of micro-sized companies and traditional service companies that feel limited by the market and are subsequently reluctant to conduct a BMI by expressing agreement (agree and rather

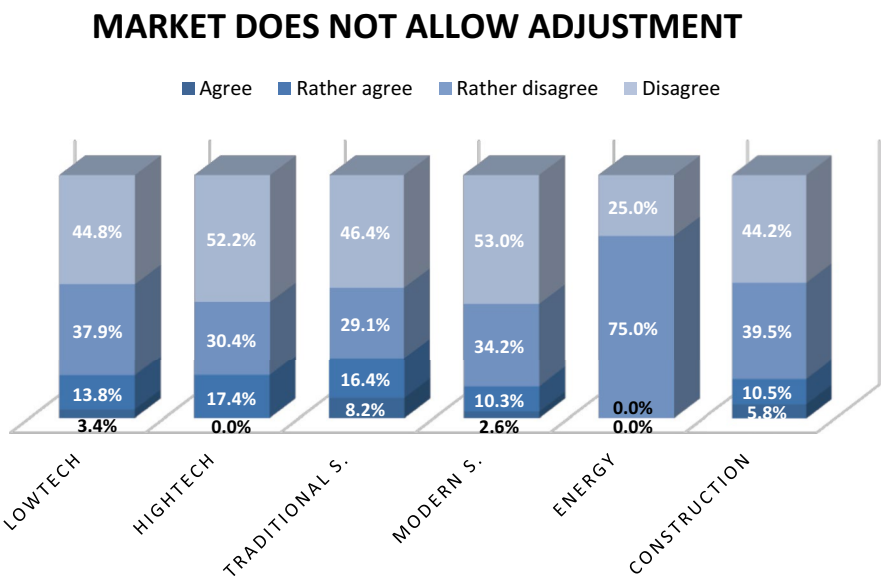

Fig. 8.16 Market barrier related to industry (N = 369, own data)

agree) to the statement "The market does not allow adjustment". Table 8.9 shows significant BMI barriers related to probable occurrence of BMIs within the next 2 years.

RQ3: Are today's barriers different from those of the past?

The following barriers have a significant negative relationship with the outcome, suggesting that organisations with this belief are less likely to have a BMI within the next 2 years:

- "We see no need for an adjustment."
- "We do not have the necessary technology."
- "We are fully occupied with the day-to-day business."
- "The market does not allow any adjustment."

The following barrier has a significant positive relationship with the outcome, suggesting that organisations with this belief are more likely to have a BMI within the next 2 years:

- "Our internal processes are complex."

"We see no need for an adjustment" and "The market does not allow any adjustment" are again identified as significant barriers implying that organisations with these beliefs are less like to have any innovation of their business model within the

Table 8.9 Significant BMI barriers related to probable occurrence of BMIs within the next 2 years (own data)

Logistic Regression: Will a BMI be done within next 2 years?	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.f or EXP(B)	
							Lower	Upper
We see no need for an adjustment.	***−1.012***	0.247	16.803	1	***0.000***	0.363	0.224	0.590
Our employees are sceptical about new things.	0.365	0.318	1.319	1	0.251	1.441	0.773	2.687
Our teams are too culturally diverse.	0.153	0.373	0.168	1	0.682	1.165	0.561	2.423
We invest cautiously because of the high costs.	−0.494	0.279	3.124	1	0.077	0.610	0.353	1.055
We do not have the own funds.	0.511	0.289	3.132	1	0.077	1.666	0.947	2.933
The risks do not justify the expected benefits.	−0.079	0.296	0.071	1	0.790	0.924	0.517	1.651
We lack the expertise in implementation.	−0.091	0.322	0.080	1	0.777	0.913	0.486	1.716
We do not have the necessary technology.	***−0.639***	0.323	3.911	1	***0.048***	0.528	0.280	0.994
We are fully occupied with the day-to-day business.	***−0.620***	0.281	4.883	1	***0.027***	0.538	0.310	0.932
Our internal processes are complex.	***0.735***	0.318	5.333	1	***0.021***	2.085	1.118	3.889
Our internal structure is complex in design.	−0.297	0.426	0.485	1	0.486	0.743	0.322	1.713
Our customer base has a complex structure.	−0.263	0.319	0.681	1	0.409	0.769	0.411	1.436
Our customers are sceptical about new things.	0.277	0.302	0.844	1	0.358	1.319	0.730	2.383
The market does not allow any adjustment.	***−0.888***	0.375	5.601	1	***0.018***	0.411	0.197	0.858
Constant	0.924	0.272	11.517	1	0.001	2.519		

next 2 years. In the following the distribution of agreement was investigated for the newly identified significant barriers.

Figure 8.17 illustrates the technology barrier related to size, and Fig. 8.18 shows the technology barrier related to industry.

Figure 8.17 shows that a higher percentage of respondents from larger companies disagreed. This suggests that larger enterprises may have more access to or confidence in their technology than smaller enterprises. As shown in Fig. 8.18, most respondents in the high-tech, modern services and energy sectors disagreed or rather disagreed with the statement, suggesting that they believe they have the necessary technology in their respective sectors. In low-tech, traditional services and construction, opinions are more mixed, with no clear consensus on whether they have the technology to conduct a BMI.

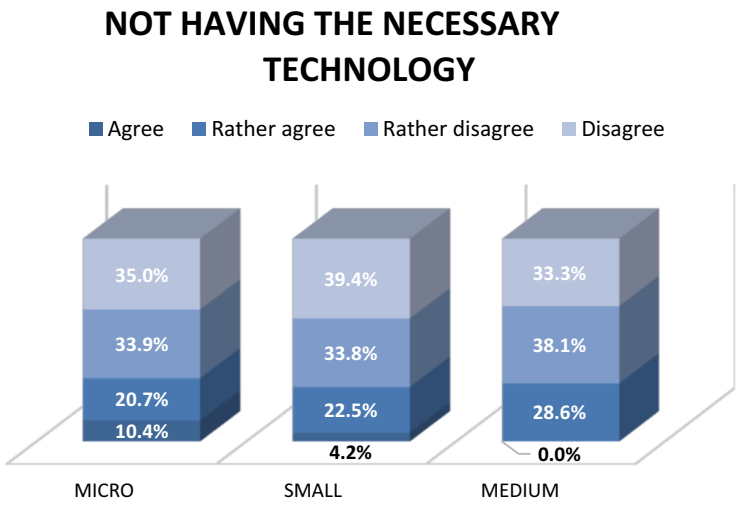

Fig. 8.17 Technology barrier related to size (N = 372, own data)

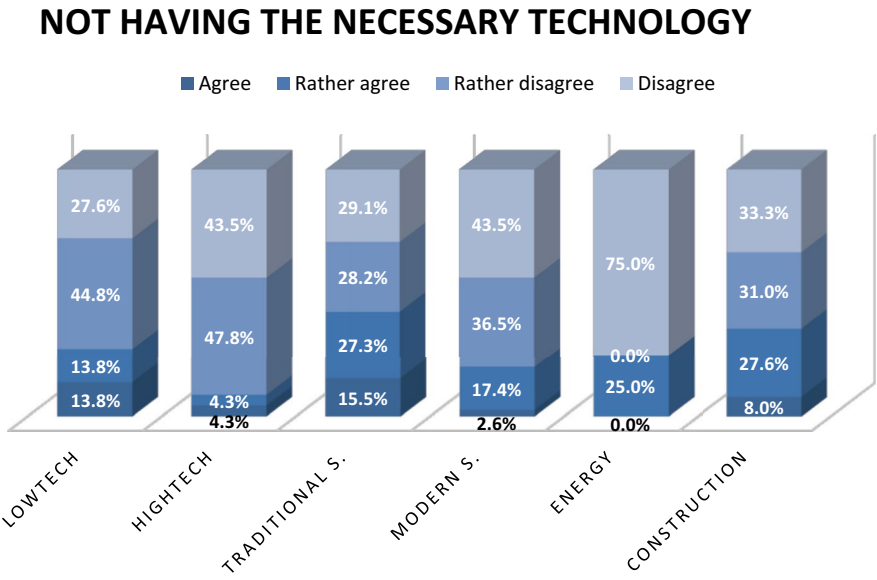

Fig. 8.18 Technology barrier related to industry (N = 368, own data)

Figure 8.19 illustrates the time barrier related to size, and Fig. 8.20 shows the time barrier to industry.

Interestingly, between 70% and almost 80% of respondents across all company sizes (Fig. 8.19) and around 60% to over 80% of respondents across all industries (Fig. 8.20) consider themselves too busy to innovate their business model.

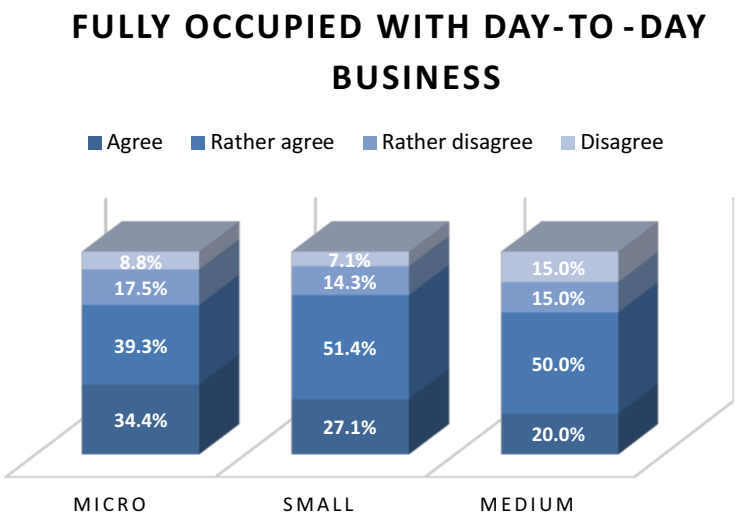

Fig. 8.19 Time barrier related to size (N = 375, own data)

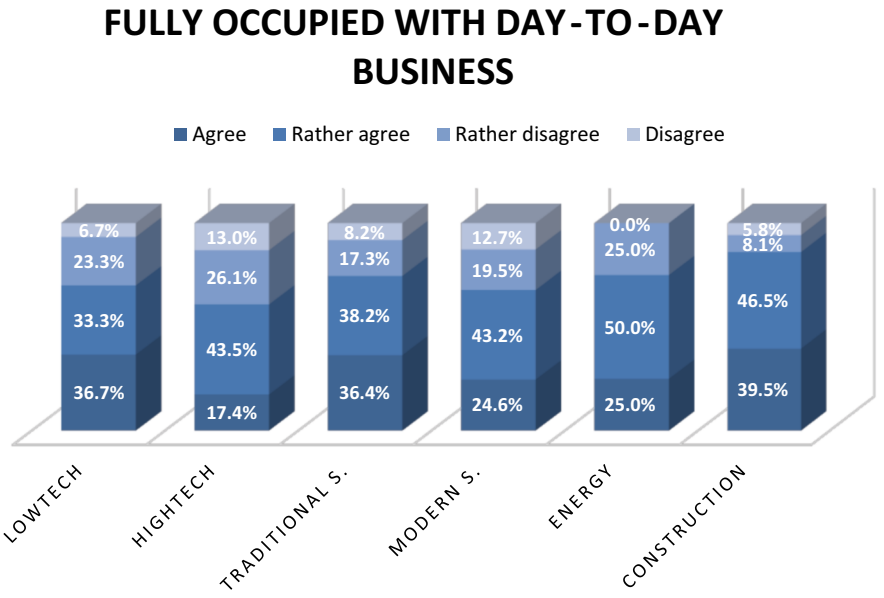

Fig. 8.20 Time barrier related to industry (N = 371, own data)

Figure 8.19 suggests that the level of agreement with being fully occupied with day-to-day business tends to decrease as the size of the company increases. As shown in Fig. 8.20, the high-tech sector has the lowest percentage of respondents agreeing that they are busy, while the construction sector has the highest.

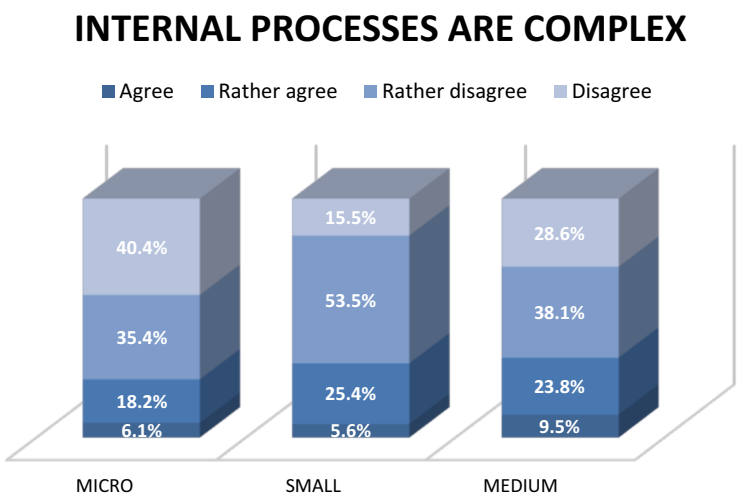

Fig. 8.21 Process barrier related to size (N = 372, own data)

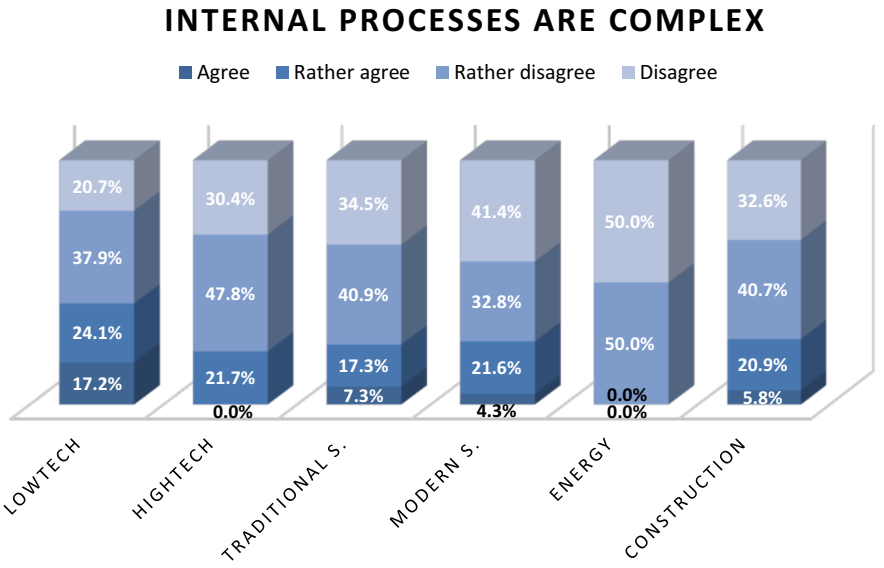

Fig. 8.22 Process barrier related to industry (N = 368, own data)

Figure 8.21 illustrates the process barrier related to size, and Fig. 8.22 shows Process barrier related to industry.

Based on the data in Fig. 8.21, it appears that most respondents across all organisation sizes do not consider their internal processes to be complex. Respondents from micro and medium-sized organisations were more likely to disagree, while those from small organisations were more likely to rather disagree. If

the internal processes are seen as being simple, this would explain the positive relationship with a BMI being done within the next 2 years as the fact of having simple internal processes could be seen as an enabler of BMI rather than of a barrier to it. The data in Fig. 8.22 shows that most respondents in the different industries tend to either rather disagree or disagree that internal processes are complex. The low-tech industry had the highest percentage of respondents who agreed or rather agreed that internal processes are complex, implying that they are less likely to undergo a BMI within the next 2 years if simple processes are seen as an enabler of BMI.

RQ4: Does the use of big data, or lack thereof, have an impact on business model development?

Table 8.10 presents the results of the logistic regression analysis of the dependent variable "Is big data being used?". Overall, the findings indicate that the intention to plan a BMI in the next 2 years is significantly associated with current use of big data. Companies planning to innovate their business models in the future are more likely to currently use big data. The trend that companies that had conducted a BMI in the last 10 years are more likely to use big data today is not statistically significant.

Table 8.11 illustrates the carrying out of BMI in the past related to usage of big data.

Table 8.11 demonstrates that the utilisation of big data significantly influenced BMI over the past decade. The positive coefficient (B = 1.029) indicates that as the usage of big data increased, the likelihood of having conducted a BMI also increased. The odds ratio (Exp(B) = 2.797) suggests that the probability of having conducted a BMI is approximately three times higher when big data was used, compared to when it was not utilised.

Table 8.12 shows the planning of BMI in the future related to the usage of big data.

Table 8.12 shows that using big data makes it more likely that a BMI will be done in the next 2 years. The positive coefficient (B = 1.312) indicates that as the usage

Table 8.10 Usage of big data related to doing a BMI (own data)

Logistic Regression: Is Big Data being used?	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Was a BMI done within the last 10 years?	0.533	0.327	2.657	1	0.103	1.704	0.898	3.234
Will a BMI be done within the next 2 years?	***1.046***	0.307	11.602	1	***0.001***	2.848	1.559	5.200
Constant	−3.771	0.557	45.802	1	0.000	0.023		

Table 8.11 Carrying out a BMI in the past related to the usage of big data (own data)

Logistic Regression: Was a BMI done within the last 10 years?	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Is Big Data being used?	***1.029***	0.278	13.691	1	***0.000***	2.797	1.622	4.823
Constant	0.054	0.116	0.216	1	0.642	1.056		

Table 8.12 Planning a BMI in the future related to the usage of big data (own data)

Logistic Regression: Will a BMI be done within the next 2 years?	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Is Big Data being used?	***1.312***	0.268	23.955	1	***0.000***	3.713	2.196	6.278
Constant	−0.488	0.120	16.641	1	0.000	0.614		

of big data increases, the likelihood of conducting a BMI also increases. The odds of conducting a BMI within the next 2 years are nearly 3.7 times higher when big data is used compared to when it is not (Exp(B) = 3.713). In other words, companies should consider using big data if they are planning for substantial innovation of their business model.

Discussion

This study sheds light on the barriers to business model innovation among small and medium-sized enterprises in the Swiss canton of Schwyz. Not surprisingly, the data show that companies that have engaged in BMI in the past, are also more likely to innovate their business models in the future. Also, the high-tech sector having the highest propensity towards BMI does not surprise, as these companies traditionally have to be at the forefront of technological development. In terms of the company size, medium-sized companies are more often engaged in BMI than smaller companies, which is in line with the literature (Spescha & Wörter, 2020).

Over the last 10 years, believing that a BMI is not necessary, being risk-averse, lacking the expertise to carry it out or feeling constrained by market rules have significantly prevented companies from carrying out a BMI, as the relationship with the dependent variable of having carried out a BMI is negative (N). Conversely, companies with a more diverse workforce may have been slightly more likely to have conducted a BMI. The detailed distribution data also show that micro enterprises were more likely to see no need to conduct a BMI, while the high-tech sector was most likely to see a need to conduct a BMI. Larger companies seemed to be more exposed to the risk of conducting a BMI, while the energy, traditional services and construction sectors were the most risk averse. In addition, there was always a proportion of around 25–30% across all sizes and sectors that were unaware of the BMI. Table 8.13 illustrates BMI barriers identified for the past 10 years.

Table 8.13 BMI barriers identified for the past 10 years (own illustration)

Barriers past 10 years
N: We see no need for an adjustment.
P: Our teams are too culturally diverse.
N: The risks do not justify the expected benefits.
N: We lack the expertise in implementation.
N: The market does not allow any adjustment.

Turning to the current plans of the sample enterprises, the size-related result of the past seems to be confirmed by the fact that larger enterprises plan to conduct a BMI more often than smaller ones, while smaller enterprises plan a single dimension innovation, e.g. a new product, or no innovation at all. Across all 6 sectors, the most technical industry (high-tech) seems to be the most likely to plan a BMI. As a rule of thumb, the more technical the sector, the more often a BMI is planned in the next 2 years.

Looking in more detail, the relevant barriers to conducting a BMI in the next 2 years are again the belief that a BMI is not needed or the feeling of being constrained by market rules. Contrary to the previous focus, additional reasons for not conducting a BMI in the next 2 years are technology driven or too busy with routine operations. The perceived complexity of internal processes seems to be more of a trigger for a BMI in the near future due to its positive (P) dependency. The detailed distribution data also shows that larger companies have more access to or trust in technology, as do high-tech companies. Conversely, smaller companies feel more preoccupied with day-to-day business, as do companies in the less technical sectors, such as construction. In addition, complex internal processes seem to trigger a BMI in the future.

Table 8.14 explains the BMI barriers identified for the next 2 years.

Linking this to the use of knowledge/data for the business model, it appears that there is a statistically significant relationship across the companies in the sample between the planning of a BMI in the next 2 years and the use of big data. Even more significant is the reverse situation: the use of big data is a significant factor that has multiplied or multiplied the likelihood of conducting the BMI based on the insights generated. This confirms the findings from the literature (Sorescu, 2017; Ciampi et al., 2021).

In addition to the barriers listed in Table 8.14, the general lack of awareness of BMI was also confirmed as a barrier in the survey results. In line with the literature, the lack of consideration of the customer perspective was not found to be a statistically significant barrier (complex customer base and sceptical customers in Table 8.14), which confirms the observation from the report of the Swiss State Secretariat for Education, Research and Innovation (Spescha & Wörter, 2020) for SMEs, particularly for traditional services and construction, which do not make much use of digital technologies, but are present as a majority in the survey sample. The other negatively connotated barriers (N) were confirmed as statistically significant, in line with the literature. Interestingly, two positively connotated barriers (P) are described as barriers in the literature: cultural diversity (Friedrich von den

Table 8.14 BMI barriers identified for the next 2 years (own illustration)

Barriers next 2 years
N: We see no need for an adjustment.
N: We do not have the necessary technology.
N: We are fully occupied with the day-to-day business.
P: Our internal processes are complex.
N: The market does not allow any adjustment.

Eichen et al., 2015) and complex internal processes (Chesbrough, 2010). In the survey, however, they are positively related to the implementation of a BMI. This means, for example, that the more diverse a team is, the more likely it is to implement a BMI. And the more complex the internal processes, the more likely it is that a BMI will be carried out. Thus, in the context of the survey conducted in the canton of Schwyz, they are seen as a trigger/enabler for BMI rather than an obstacle to BMI. This may be due to the high proportion of modern service companies in the sample.

Interestingly, internal resistance did not have a significant impact, either in the past or in the future. This contrasts with the findings of Chesbrough (2010), who identified resistance to change as the biggest barrier to BMI. Foss & Saebi (2016) also mentioned organisational resistance as a major hurdle, as it threatens the current positions and privileges of employees. We can assume that this may be related to the large size of the SMEs in the sample. In smaller companies it is easier to involve the whole team in innovation processes, whereas in larger companies it is often more top-down. This is why organisational resistance did not have a big impact.

Table 8.15 illustrates the identified significant barriers and anticipated linkage to SME Type, KIS Focus and Data Affinity.

Looking at each barrier and evaluating the initial grouping, the insights generated based on the survey conducted in the canton of Schwyz and in particular on the SME types (Heikkilä et al., 2017) seem to confirm the following:

- "We don't see a need for adaptation" seems to be the main barrier for micro companies, which are generally more reluctant to innovate the business model, and for industries that do not have a high technical exposure.
- "Our teams are too culturally diverse" (enabler) may be an enabler to BMI, particularly for profit-seeking SMEs, as they tend to optimise their costs and back-office processes first. In addition, this may be even more relevant the more knowledge and data-driven an SME is, as a diverse workforce brings in multiple views.
- "The risks do not justify the expected benefits" may be a barrier for growth-oriented SMEs in particular, as they may focus on the customer side of risk assessment first, especially if they are working with data.
- "We lack the expertise to implement" and "We do not have the necessary technology" may initially block start-ups, even more so if they belong to the KIS group and are data affine, due to the impact on the entire business model.
- On the other hand, "We are fully occupied with day-to-day business" may generally block BMI for any company that does not have the resources. Larger

Table 8.15 Identified significant barriers and anticipated linkage to SME Type, KIS Focus and Data Affinity (own illustration)

Linking barriers to SME type, KIS focus and data affinity			
Barrier	SME type	KIS focus	Data affinity
N: We see no need for an adjustment.	No BMI interest	No	No
~~Our employees are sceptical about new things~~.	~~Profitability~~	~~No~~	~~No~~
P: Our teams are too culturally diverse.	Profitability	Yes	Yes
~~We invest cautiously because of the high costs~~.	~~Profitability~~	~~Yes~~	~~Yes~~
~~We do not have the own funds~~.	~~All~~	~~Yes~~	~~No~~
N: The risks do not justify the expected benefits.	Growth	No	Yes
N: We lack the expertise in implementation.	New Business	Yes	Yes
N: We do not have the necessary technology.	New Business	Yes	Yes
N: We are fully occupied with the day-to-day business.	All	No	No
P: Our internal processes are complex.	Profitability	Yes	No
~~Our internal structure is complex in design~~.	~~New Business~~	~~No~~	~~Yes~~
~~Our customer base has a complex structure~~.	~~Growth~~	~~Yes~~	~~No~~
~~Our customers are sceptical about new things~~.	~~Growth~~	~~No~~	~~No~~
N: The market does not allow any adjustment.	Growth	No	No

companies may have a slight advantage here, based on the results above, as they may not have the same level of resource constraints.

- "Our internal processes are complex" (enabler) can support a BMI in profitability seeking SMEs first, especially if they belong to the KIS group, because they focus first on the quality and efficiency of their key activities.
- "The market does not allow any adaptation" may be a barrier to BMI for mainly growth-oriented SMEs, as they focus on value proposition.

For policy makers, it is recommended to implement awareness workshops to demonstrate the importance and benefits of BMI, especially targeting the companies that do not know BMI and do not see need for adaptation. Policy makers can develop workshops to help companies understand and mitigate the risks of innovation. The lack of expertise and technology may be reduced through mentorship programmes, the availability of learning material on tools and techniques and grants for the development of technology, for example together with institutions of higher education. The mentorship programmes can help companies to reorganise their resources to not being fully occupied with the day-to-day business anymore. Furthermore, the exchange of best practices in the context of innovation management and daily business operations can be facilitated through peer learning and networking opportunities. This can also lead to the identification of unrecognised market opportunities that may not have been apparent to managers who feel that the market will not allow them to adapt. In addition, policy makers can provide financial incentives for innovative projects within companies and for innovation hubs or co-working spaces.

Lastly, the regulatory environment should make it as easy as possible for companies to innovate, e.g. through short approval processes.

Conclusion

Besides the knowledge barrier (BMI is not known), 6 further barriers have been identified as relevant barriers to innovation, particularly for BMI, for a sample of companies listed in the commercial register of canton of Schwyz. Two additional barriers turned out to rather be a trigger/enabler for BMI. The barriers taking effect mostly in the past were rather intrinsic, related to diversity, risk averseness and own expertise. The barriers most relevant for the future are cost, technology, and capacity driven. In general, companies not seeing the need or feeling limited by the market rules have not and will not conduct a BMI, even though they may know BMI. This study gives an overview of barriers in Swiss SMEs and can be a starting point for companies that want to innovate to be aware of where the pitfalls lay.

Future Research

Due to the narrow focus of this paper and the wide heterogeneity in the sample, within the service sector particularly, an industry-focused follow-up work, e.g., one for traditional (non-digital) services and a second one for modern (KIS, digital) services may bring further detailed insights on the barriers to BMI. In addition, tailoring future surveys to the SME Type in addition to the industry sector may generate valuable insights on the usage and relevance of BMI in the related SMEs.

Limitations

The response rate of 10% is one of the limitations, which could lead to a potential non-response bias in the results as the participants who responded may not be representative of the entire target population. Additionally, there is a risk of self-selection, where individuals who chose to respond may have other opinions that do not reflect the entire target population, e.g. people that have no interest in innovation might participate less. This could affect the objectivity of the results. Also, the results are cross-sectional and only represent one canton of Switzerland. These factors should be considered when interpreting the results of the study.

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