How applying the Lean Start-up Methodology can affect Business Model Innovation

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Abstract: Start-ups often apply entrepreneurial approaches like the Lean Start-up Method (LSM) and Business Model Innovation (BMI). LSM emphasises experimentation during product development and testing in close interactions with potential customers to get first-hand feedback. Lessons learned are implemented so that improved product variants go through further feedback loops and so on. Products are developed by rapidly getting closer to what customers really want. BMI focuses on altering existing or developing new business models to enable differentiation from competitors. Typical elements of business models include target customer segments, value propositions, value chains and revenue mechanisms. BMI is assumed to take place when at least two of these elements are innovated in conjunction. Going beyond typical product or process innovation in isolation, BMI suggests to holistically consider interdependencies within the entire business model. The need for a better understanding on connections between LSM and BMI is expressed in the literature and this work's goal is to contribute to this discussion. More specifically, this work seeks to address the question of how the application of LSM can affect BMI. In search of answers, business plans of 25 finalist start-ups in the 2022 edition of an annual innovation competition in Switzerland are reviewed. While the evidence on the connection between LSM and BMI is not entirely convincing, reviewed business plans reveal insights into LSM-related factors at play that can support business model changes and trigger BMI.

Keywords: Lean Start-Up Method, Business Model Innovation, Business Model Change, Interdependencies, Competitive Advantage.

1. Introduction

The Lean Start-up Method (LSM) and Business Model Innovation (BMI) are popular approaches among entrepreneurs and widely discussed in the literature (Blank and Eckhardt, 2023; Burnell, Stevenson and Fisher, 2023; Faria et al, 2021; Ghezzi and Cavallo, 2020; Jodlbauer, 2020; Lizarelli et al, 2022; Ries, 2011, 2017; Silva et al, 2020). LSM supports validated learning through experimentation to get customer feedback in order to test assumptions about the business model and inform adjustments (Balocco et al, 2019; Blank, 2013; Ghezzi, 2018; Ries, 2011). This is performed by going through the Build-Measure-Learn (BML) cycle which requires a Minimal Viable Product (MVP), a rudimentary version of the envisaged product, to be tested and given feedback on by close customers (Blank and Eckhardt, 2023; Burnell, Stevenson and Fisher, 2023; Ghezzi and Cavallo, 2020; Lizarelli et al, 2022; Ries, 2011, 2017; Silva et al, 2020).

BMI focuses on innovative adjustments to specific elements of a business model to allow for different or new ways to create value (Faria et al, 2021; Jodlbauer, 2020; Philippi, Hinz and Kabous, 2022). This work follows the notion that for BMI to hold, at least two elements such as value proposition, value chain, revenue logic and customer segment need to be innovated (Lang, 2020; Philippi and von Büren, 2021; Schallmo, 2013).

While LSM and BMI are academically and practically relevant, this work focuses on connections between the two. The need for deeper insights on LSM as an enabler for BMI is expressed in the literature with theoretical and practical relevance in mind (Foss and Saebi, 2018; Ghezzi and Cavallo, 2020; Rummel, Hüsig and Steinhauser, 2022; Silva et al, 2020; Trimi and Berbegal-Mirabent, 2012). The goal of this work is to provide some insights by addressing the research question of how the application of LSM can affect BMI among start-ups.

The paper is structured as follows: First, the relevant literature on connections between LSM and BMI is reviewed and hypotheses are derived. Second, the methodological approach is presented. Third, research results are presented and discussed. Fourth, concluding remarks are made including limitations and directions for further research.

2. Literature review

The literature on LSM as well as BMI is reviewed with emphasis on how the application of LSM can affect elements of business models and BMI. LSM and other lean approaches are proposed to help entrepreneurs in

the continuing development of business models and BMI (Balocco et al, 2019: Bortolini et al, 2021; de Aguiar et al, 2019; Frederiksen and Brem, 2017; Ghezzi, 2018; Ghezzi and Cavallo, 2020; Kesting and Günzel-Jensen, 2015; Mollick, 2019; Silva et al, 2020). A deeper exploration of this combination is recommended in the literature: First, in the context of academic relevance, the need for further research on LSM as a supporting tool for BMI is expressed to improve understanding of the matter (Rummel, Hüsig and Steinhauser, 2022; Silva et al, 2020). Second, in the context of practical relevance, the need for relevant entrepreneurial methods to assist BMI is mentioned (Foss and Saebi, 2018; Ghezzi and Cavallo, 2020; Trimi and Berbegal-Mirabent, 2012). Based on the literature on the connection between LSM and BMI, hypotheses are derived to assist further research.

2.1 LSM

BML as a core component of LSM enables start-ups to engage in validated learning through experimentation such as, for instance, letting potential customers test a new product variant or changed feature (Blank and Dorf, 2012; Blank and Eckhardt, 2023; Burnell, Stevenson and Fisher, 2023; Ghezzi and Cavallo, 2020; Ries, 2011, 2017; Silva et al, 2020). For validated learning to take place, business hypotheses are formulated and tested in order to measure the impact of any change and to validate assumptions about the business model (Bortolini et al, 2021; Ghezzi and Cavallo, 2020; Blank and Dorf, 2012). For BML to be applied in practice, an MVP and close customer interactions are required. An MVP is a basic and early version of the envisaged product or service that is tested by customers to give feedback (Ghezzi and Cavallo, 2020; Hinz and Eisenbart, 2019; Ries, 2011, 2017; Silva et al, 2020). For this feedback process to work repeatedly in order to improve the offering, close customer interactions are necessary (Balocco et al, 2019; Ghezzi and Cavallo, 2020; Ries, 2011, 2017).

2.2 BMI

Changes to the business model represent an innovative alteration of how value is created and appropriated (Balocco et al, 2019; Chesbrough, 2007, 2010; Zott and Amit, 2007; Zott, Amit and Massa, 2011; Osiyevskyy and Dewald, 2015). While this is a broad notion of change, BMI is more rigidly defined as innovation of specific elements of the business model such as value proposition, value chain, revenue logic and customer segment (Augsten et al, 2017; Casadesus-Masanell and Zhu, 2013; Chesbrough, 2010; Gassmann et al, 2017; Jodlbauer, 2020; Philippi, Hinz and Kabous, 2022; Rayna and Striukova, 2016). This work follows the notion that at least two of these elements of the business model need to be innovated for BMI to hold (Lang, 2020; Philippi, Hinz and Kabous, 2022; Philippi and von Büren, 2021; Schallmo, 2013).

2.3 Impact of LSM on BMI

To account for LSM holistically, this work focuses specifically on the effect BML has on elements of business models and BMI. LSM as a powerful entrepreneurial approach typically focuses on innovating the value proposition of the product or service, however, it can go beyond that to affect other elements of a business model (Bortolini et al, 2021; Ghezzi and Cavallo, 2020; Silva et al, 2020).

A disciplined BML process with experimentation and hypothesis testing that supports validated learning can facilitate BMI, which is especially relevant in highly dynamic digital industries (Bortolini et al, 2021; Burmeister et al, 2016; Ghezzi and Cavallo, 2020; Mcgrath, 2010; Ries, 2011; Rummel, Hüsig and Steinhauser, 2022). When a hypothesis is rejected based on experiment results, fundamental changes of the business model may be necessary. This is referred to as pivoting when a new hypothesis is defined and tested again with experiments (Blank and Dorf, 2012; Bortolini et al, 2021; Silva et al, 2020; Ries, 2011). Pivots represent course corrections when entrepreneurs respond to fundamentally changing customer preferences or newly available technologies, for instance (Silva et al, 2020; Ries, 2011). Major corrections can help entrepreneurs to improve their business model along various dimensions (Bohn and Kundisch, 2018; Bosch et al, 2013). In instances of minor changes, iterating allows entrepreneurs to rapidly adjust the business model further and conduct more experiments to test hypotheses (Blank and Dorf, 2012; Bortolini et al, 2021; Ries, 2011). Iterating also enables entrepreneurs to finetune their business model and align it with strategy in case fundamental changes from pivoting have caused misalignment (Bohn and Kundisch, 2018; Foss and Saebi, 2017; Teece, 2010). Based on the reviewed literature, Hypothesis H1 is derived: *The more validated learning takes place through BML, the more likely pivoting / iterating is triggered.*

On the matter of pivoting and iterating, Bortolini et al (2021) note that LSM can support start-ups in innovating and improving their product or service offering and related value proposition. Beyond that, LSM can trigger changes and innovation of other elements of business models including value chain, revenue streams and

(access to) customer segments (Balocco et al, 2019; Bohn and Kundisch, 2018; Bortolini et al, 2021; Eisemann et al, 2011; Silva et al, 2020). Experimentation through BML can lead entrepreneurs to adjust one or more elements of their business model rapidly (Balocco et al, 2019; Bortolini et al, 2021; Blank, 2013; Ghezzi and Cavallo, 2020; Rummel, Hüsig and Steinhauser; 2022; Silva et al, 2020; Tesch, Brillinger and Bilgeri, 2017; Yang et al, 2019).

For instance, Balocco et al (2019) present evidence that regular communication and interactions with customers may trigger changes to how the value proposition is delivered (i.e., value chain / architecture / network) as well as how financial transactions are handled (i.e., financial mechanisms). Balocco et al (2019) note that a disciplined change process (i.e., identification of required changes, preparation for and execution of change) can affect multiple elements of the business model simultaneously. Examples for changes along the value chain include acquiring new knowledge, hiring additional (human) resources, establishing new partnerships (e.g., suppliers, distributors) and introducing new corporate functions and activities (Balocco et al, 2019). Changes regarding financial mechanisms include developing new revenue models (e.g., payments, debt collection) and introducing alternative cost structures (e.g., removal of expensive operations, automation of processes, focus on scalability), to name a few (Balocco et al, 2019). Hypothesis H2 is derived from the reviewed literature: *The more pivoting / iterating is triggered, the more likely multiple business model elements are changed and BMI occurs.*

3. Methodology

This work seeks to examine how LSM can affect elements of business models and BMI. The relevant literature on the matter was reviewed with particular emphasis on linkages between LSM and BMI and hypotheses were derived. In search for evidence, business plans of 25 start-ups participating in the Swiss Innovation Challenge in 2022 were examined. Among 100 start-up teams admitted to the competition, they have passed two selection rounds based on their business plans and pitches and have successfully qualified as the 25 finalists.

For the purpose of this work, the competition allows for a consistent sample selection and represents a reliable source of innovative start-ups for research. Following almost 10 years of successful annual operation and continuous improvements, sample selection of the competition follows a proven process based on consistent and relevant evaluation criteria. For instance, these include innovativeness, feasibility and strength of the team. An experienced and accomplished jury uses these criteria to carefully assess business plans and pitches. This disciplined and elaborate process seeks to ensure that the cohort of 25 finalists consists of start-ups that meet high standards and are likely to succeed.

The research procedure for this work consisted of a review of business plans done independently by three researchers. Based on a defined set of criteria and following definitions of the relevant literature, business plans were examined for evidence of LSM in the form of close customer relationships, MVP and BML. Likewise, business plans were screened for evidence of innovation on different elements of business models. With the evidence for LSM and BMI identified, business plans were checked for any connections between the application of LSM and BMI. Finally, results of the involved three researchers were aggregated and analysed.

Business plans were chosen as the unit of analysis for this work because they are frequently used in practice as a selection tool. For instance, most start-up competition juries, business angel clubs and professional investors require start-ups to deliver a convincing business plan. Because of the sheer number of start-ups seeking admission to competitions and access to venture funding, business plans are often used for the initial screening before interacting personally with a considerably smaller cohort of selected start-ups.

This approach was meant to assess if business plans are a useful source of evidence for widely used entrepreneurial approaches like LSM and BMI as well as connections between them. However, as mentioned in the conclusion, further research with other methodological approaches like in-depth interviews with start-up teams shall be done for deeper insights.

4. Results and discussion

The importance of a better understanding of causal relationships between LSM and BMI has been discussed in the literature (Foss and Saebi, 2018; Ghezzi and Cavallo, 2020; Rummel, Hüsig and Steinhauser, 2022; Silva et al, 2020; Trimi and Berbegal-Mirabent, 2012). More specifically, this work examines the effect that the application of LSM can have on BMI by referring to evidence from reviewing the mentioned business plans. Such evidence can usually be found in sections describing the business model in general, products or services (development), customer segments, operations, financial and implementation plans. In line with the literature review, results are presented and discussed on three clusters: LSM, BMI and impact of LSM on BMI.

4.1 LSM

As illustrated in Figure 1, results obtained from the review of business plans suggest that most start-ups entertain close customer relationships, however, evidence for MVP and BML is considerably weaker.

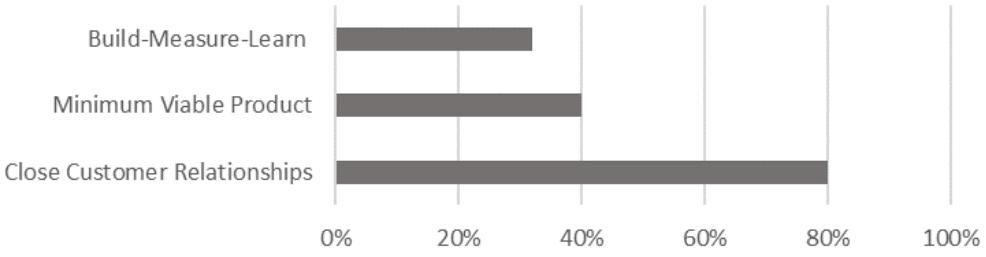

Figure 1: Components of LSM applied by start-ups

Close customer relationships appear to be evident in 80% of cases in this sample. While these interactions are important for start-ups in general and an integral component of LSM (Balocco et al, 2019; Ghezzi and Cavallo, 2020; Ries, 2011, 2017), such evidence cannot be found for the remaining cases. In the review of business plans, differentiation was made based on the degree of customer relationships, i.e., some customer interaction (which, by definition, every start-up has) versus truly close and regular interactions (in the form of workshops, co-development and feedback sessions).

When screening for the use of an MVP, the evidence is weaker with 40% of reviewed business plans containing explicit references. In these cases, an MVP is explicitly mentioned in the implementation plan which also contains background information such as development stages and testing (Ghezzi and Cavallo, 2020; Ries, 2011, 2017; Silva et al, 2020). When BML is concerned, evidence is weaker still with only 32% of start-ups explicitly applying it. Two reasons in particular appear plausible for the weaker evidence for MVP and BML. First, a disciplined, consistent and continuous application of BML and MVP development as defined by Ries (2011) tend to be rare. Many start-ups may just go through some stages of BML or even complete one cycle but then stop experimenting and testing. However, they would need to go through the cycle multiple times in the strict sense suggested by LSM (Ghezzi and Cavallo, 2020; Ries, 2011, 2017; Silva et al, 2020). Second, this is explained by the strict review approach undertaken in this work. When various activities of BML are not explicitly mentioned, the case is not counted. For instance, such activities include defining assumptions, running experiments to test them, collecting and evaluating data, making changes, illustrating a roadmap, working towards milestones, etc. (Blank and Dorf, 2012; Ghezzi and Cavallo, 2020; Ries, 2011, 2017; Silva et al, 2020). In many of these cases, the implementation plan refers to an MVP that is given to potential customers for feedback. Based on reviewed business plans, however, an improved MVP tends to be described as the end point of BML which does not account for further testing, feedback rounds, measurements and adjustments.

4.2 BMI

Figure 2 illustrates the results from the review of business plans with innovation on the value chain found in 24%, on the revenue / financial model in 16% and on customer segments in 12% of cases.

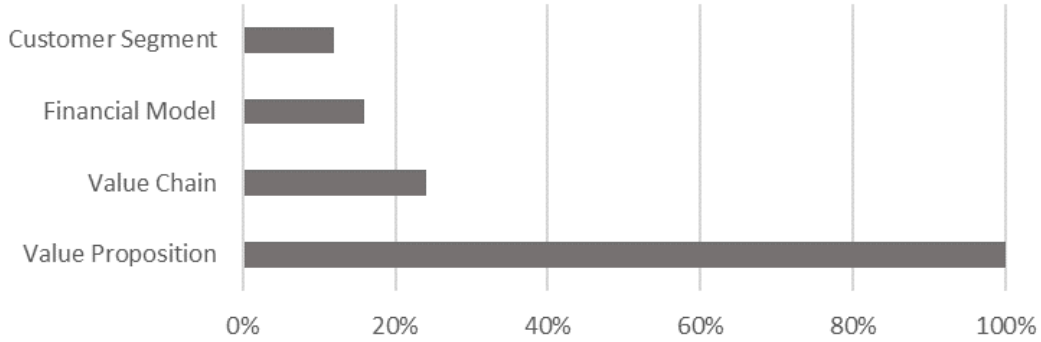

Figure 2: Elements of business model innovated by start-ups

The results also suggest that in all reviewed cases, innovation focuses on the value proposition of products and services which is in line with the literature (Foss and Saebi, 2017; Hock-Doepgen et al, 2021; Philippi, Hinz and Kabous, 2022). This is true for all reviewed business plans in this work because concerned start-ups were admitted to the mentioned competition for their innovative value proposition. The findings also suggest that innovations on other elements of business plans are relatively rare. Overall, BMI is evident in 40% of concerned start-ups with innovation of at least two elements of their business model (Lang, 2020; Philippi, Hinz and Kabous, 2022; Philippi and von Büren, 2021; Schallmo, 2013). In most of these BMI cases, innovation of the value proposition is combined with either the value chain or the revenue / financial model. In rare BMI cases, innovation of three elements of the business model can be identified.

4.3 Impact of LSM on BMI

The question remains what evidence can be found in reviewed business plans for an impact of LSM on BMI. As explained before, this impact is observed by focusing on the application of BML as the all-encompassing aspect of LSM (Blank and Dorf, 2012; Ghezzi and Cavallo, 2020; Ries, 2011, 2017; Silva et al, 2020). Results shown in Figure 3 suggest that out of those 32% reviewed business plans with evidence for BML (as per Figure 1), all concerned start-ups innovate their value proposition, 25% each their value chain or revenue model and 13% their customer segment.

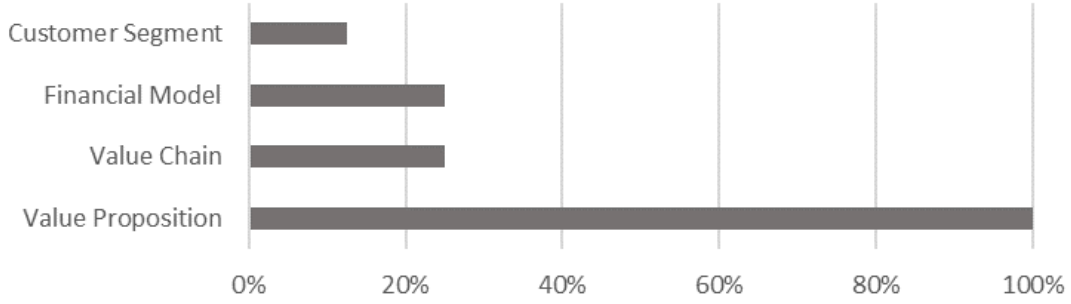

Figure 3: Elements of business model innovated by start-ups that pursue BML

In total, 38% of those BML cases can be classified to engage in BMI by innovating at least two elements of their business model (Lang, 2020; Philippi and von Büren, 2021). Based on the results, the evidence for an impact of LSM on BMI appears to be weak and insights are limited in the context of Hypothesis H1 and H2. As mentioned above, H1 suggests that more validated learning through BML makes pivoting / iterating more likely. However, while BML by definition involves validated learning that can inform pivoting and iterating, the degree and likelihood of that cannot be examined on the basis of available results. H2 in turn suggests that more pivoting / iterating makes it more likely that multiple business model elements are changed and BMI occurs. As noted above, the results indicate that 38% of identified cases with evidence of BML pursue BMI. As with H1, however, the results do not provide an indication on the degree and likelihood of that happening on a case-by-case basis. In summary, further research shall be done to provide a better understanding on the matter.

4.4 Further insights on impact of LSM on BMI

It is important to note that findings regarding the impact of LSM on BMI are based on reviews of business plans following strict definitions. This raises the question if other factors can be found that are relevant for the connection between BML and BMI that can lead to innovation and trigger BMI (Balocco et al, 2019; Saebi et al, 2017). Indeed, screening the sample of business plans based on a more flexible notion of business model change (Balocco et al, 2019) reveals stronger evidence for a connection. As illustrated in Figure 4, results obtained from the review of business plans reveal evidence of supporting factors like digital business models, support from coaches / mentors, secured funding from professional investors, participation in start-up competitions and intellectual property.

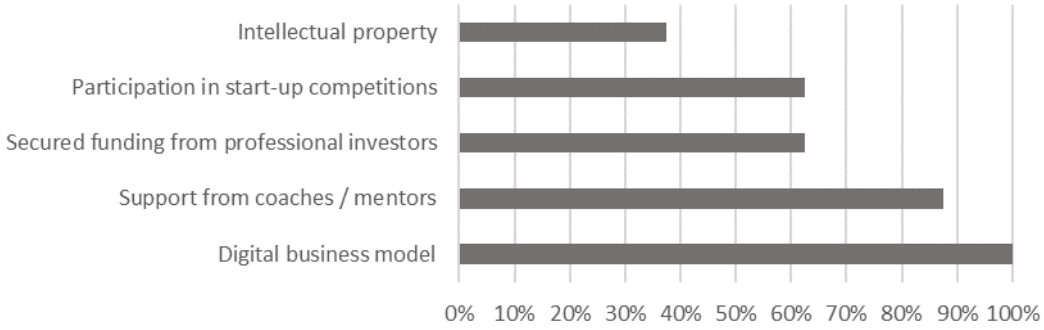

Figure 4: Identified factors supporting business model change among start-ups that pursue BML

Digital business models: All reviewed start-ups that pursue BML have a business model with a digital product or service offering. This can be explained by the fact that the application of BML is considerably easier in the digital context. For instance, experiments and customer testing can be set-up and conducted faster and cheaper when concerning a digital offering like software or application (Balocco et al, 2019; Bohn and Kundisch, 2018; Ghezzi and Cavallo, 2020). A digital business model can therefore be supportive of innovation and business model change (Balocco et al, 2019; Ghezzi and Cavallo, 2020).

Support from coaches / mentors: 88% of start-ups that pursue BML receive professional coaching and / or mentoring. Advice from more experienced individuals who provide an outside view and constructive feedback is especially important for younger companies. Their business models are relatively flexible and can be innovated and changed to account for a highly dynamic market (Bouwman et al, 2019; Klewitz and Hansen, 2014). Advisors can be a great support when navigating through challenges of early start-up stages when the innovation focus takes shape to build competitive advantage (Minsch and Can, 2020).

Secured funding from professional investors: 63% of those start-ups pursuing BML have gone through various funding rounds and have at least secured series A funding. To reach that stage, they have pitched to various professional investors. To have success in this highly competitive process, founders are required to critically evaluate, adjust and innovate elements of their business model which can go beyond the value proposition (Balocco et al, 2019; Bohn and Kundisch, 2018). To convince investors of financial feasibility, founders tend to put increasing emphasis on the financial / revenue model as well.

Participation in start-up competitions: 63% of those start-ups pursuing BML have participated in at least two competitions. As with pitches to professional investors, founders are expected to describe their business model and convince jury members and audience of its feasibility. In return, they get constructive feedback which represents an opportunity to change and innovate elements of their business model (Balocco et al, 2019; Ghezzi and Cavallo, 2020). It is not uncommon for founders to pitch at competitions regularly to gain traction and speed up innovation and development processes.

Intellectual property: 38% of those start-ups pursuing BML have successfully registered patents. Founders will have carefully analysed their offering in detail and gone through feedback loops to be able to explain how they can meet patenting requirements. This demanding process represents an opportunity for founders to consider implications this may have on business model change (Balocco et al, 2019).

In summary, it appears that these supporting factors observed in business plans of start-ups pursuing BML provide some insights into the connection between LSM and business model changes which may trigger BMI (Balocco et al, 2019; Saebi et al, 2017).

5. Conclusion

This work has various implications. On the theoretical level, it seeks to contribute to a better understanding on how the application of LSM can affect BMI among start-ups is expressed in the relevant literature (Ghezzi and Cavallo, 2020; Rummel, Hüsig and Steinhauser, 2022; Silva et al, 2020). In search for evidence, business plans of 25 start-ups participating as finalists in the noted competition in 2022 were reviewed.

On the practical level, a better theoretical understanding of discussed entrepreneurial concepts may uncover findings that are relevant in practice, especially when more conscious linkages between LSM and BMI are

concerned (Foss and Saebi, 2018; Ghezzi and Cavallo, 2020; Trimi and Berbegal-Mirabent, 2012). While LSM and BMI are frequently applied in practice, linkages between them, combinations of approaches and other related or unrelated supporting factors may boost their practical relevance and potential.

On the methodological level, it becomes apparent that the chosen approach of reviewing business plans alone does not provide the desired insights. While some evidence was found for the application of LSM and BMI, findings on the connection between these two approaches are less convincing.

Because the review of business plans is based on written and rigid documents, important details may not have been described explicitly enough or may have been omitted. In other words, some start-ups may apply BML and pursue BMI in line with definitions, but simply missed to explain that in their business plan. Given these limitations, further research shall be done in the form of semi-structured interviews with concerned start-up teams. Personal conversations will likely uncover details on how entrepreneurs apply LSM in general and BML specifically and what the impact on BMI is. This shall also provide a better basis to test derived hypotheses. In-depth interactions with founding teams may also uncover insights on other factors at play between LSM and BMI that support business model changes in general.

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