Article

Business Model Innovation Factors of Small and Medium-Sized Enterprises in Bolivia

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Abstract: This paper aims to explore how four Bolivian small and medium-sized enterprises’ business has overcome the gaps in reliance on traditional small and medium-sized enterprises’ business models, i.e., to extract and sell raw unrefined natural resources in a local area, and instead make productive use of innovation inputs (technology, higher-educated people) by innovating their business models. We were particularly interested in how the small and medium-sized enterprises could manage to develop their business models in relation to the socio-cultural, economic, and technological contexts in a lower middle-income country such as Bolivia. We employ an exploratory multiple case study. The study’s results show that the four selected small and medium-sized enterprises’ business model innovation processes followed two different business model innovation patterns, a technology-driven pattern and market-driven pattern shaped by the macro-level factors of availability of natural resources, the informally organized economy, regulations, and access to higher education resources. The paper ends with presenting the managerial, policy, and theoretical implications of the study.

Keywords: business model; business model innovation; lower middle-income economies; small and medium-sized enterprise; macro level factors

1. Introduction

No business model is an island. Business model research highlights that a company’s business model is connected to and depends on an eco-system of partners, suppliers, customers, and other stakeholders (e.g., Zott et al. 2011). Less research attention has been given to business models’ connection and dependence on the macro environment of a country (Foss and Saebi 2017; Wirtz and Daiser 2017). While the importance of technology development for business model innovation is often recognized in research (e.g., Chesbrough 2010; Zott et al. 2011) and factors such as regulations, globalization, and market shifts (Foss and Saebi 2017; Wirtz and Daiser 2017), the institutional environment of a country and how it tends to shape a company’s business model is more seldom researched. Business model research is often done in resource-rich countries with economically and politically stable structures, indicating a need for research in resource-limited and more informally organized countries and how it shapes the companies’ business models as well as their attempts to innovate their business models.

Small and medium-sized enterprises (SMEs) play a major economic role, representing approximately 90% of organizations worldwide and some 70% of jobs globally (OECD 2017). SMEs have the potential to become an essential wellspring of economic development; however, this potential is not always recognized by their host communities and countries (Imran et al. 2019). In Bolivia, the significance of SMEs for socioeconomic development is particularly notable, serving as they do as vital vehicles for both survival
strategies and avenues for growth, especially for low-income families (Dana 2011). In Bolivia, SMEs constitute 80% of economic activity among enterprises, generate 85% of the workforce, and contribute approximately 35% to the GDP (Encinas and Arteaga 2007). Thus, the need for Bolivian SMEs to increase their value creation, value offers, and value capture is vital for growing the whole economy. This is, however, easier, said than done. Current BMI research holds that this requires both SME internal motivation and competence (e.g., entrepreneurial spirit, knowledge) and external opportunities such as new technologies and to look beyond value creation, combining it with product innovation and insights into customers’ value processes (Visnjic et al. 2014; Müller et al. 2018; Attanasio et al. 2022).

Bolivia’s reliance on the export of non-renewable natural resources has historically shaped its economic structure, leaving small and medium-sized enterprises (SMEs) with the task of finding their footing in a predominantly resource-driven market (GEM 2014; Schwab 2019). Business model innovation in Bolivian SMEs has further been influenced by the country’s efforts to transition from reliance on natural resource exports to a more diversified economy (Acevedo 2018; Bolivian Long Term Plan for 2025 n.d.). This shift requires SMEs to adopt new business models that are resilient to commodity price volatility and aligned with sustainability trends. Moreover, the integration of SMEs into global value chains presents both opportunities and challenges, necessitating business model innovations that can leverage technologies to enhance competitiveness.

The macro environment, characterized by economic, political, and social factors, plays a significant, but understudied, role in shaping the business models and innovation pathways of SMEs (Foss and Saebi 2017). While there are structural challenges, such as regulations and environmental uncertainty (Foss and Saebi 2017), there are also opportunities for SMEs to leverage technological transformation and supportive government policies to innovate and thrive in both local and global markets (Foss and Saebi 2017). The need for technological and innovation capabilities is underscored by Bolivia’s vulnerability to external shocks, such as commodity price volatility and climate-related damages (Bambe et al. 2024), which necessitate resilient and adaptable business models. Bolivia’s performance in innovation inputs, such as increased higher education of human capital, has been relatively strong in recent years (Muyor-Rodríguez et al. 2021), but this has not translated effectively into innovation or entrepreneurial outputs (GEM 2014; Schwab 2019), indicating a gap in the innovation ecosystem. These gaps suggest that while there may be a foundation for innovation, most Bolivian SMEs struggle to convert these inputs into tangible business model changes that can drive growth and competitiveness.

This paper aims to explore how four Bolivian SMEs have overcome the gaps in reliance on traditional SME business models, e.g., extracting and selling raw unrefined natural resources in a local area, and instead make productive use of innovation inputs (technology, higher-educated people) by innovating their business models. To address the research aim, we will use an explorative and qualitative methodological approach researching four selected cases of Bolivian SMEs that have innovated their business models in the direction of less reliance on commodity price volatility, use of technology and market development, and more sustainable solutions.

The four exploratory case studies give micro-level examples of how lower middle-income countries, like Bolivia, traditionally dependent on exports of natural resources, may upgrade the economy relying on SMEs’ ability to innovate their business model by combining unique resources, new technologies, and market adaptation in a sustainable way, drawing on university competence and networks. Our study concludes by identifying the functions of the SMEs’ business model innovation in upgrading the Bolivian economy, being less dependent on price fluctuations on natural resources and adding value to their products. The SMEs’ business models connect Bolivia’s informal, small community businesses, extracting and selling unrefined natural resources with innovative capabilities in engineering, product development, market focus, customer development, and expanding distribution networks. In this way, the SMEs add value to their product offerings. Key to the SMEs’ capability for business model innovation is their ability to draw on higher edu-
cation, both in terms of higher-educated labor and the university’s competence, resources, and networks.

This work is structured as follows. Section 2 presents the empirical background of the study, focusing on the specific aspects of the economy and social situation and SMEs in Bolivia. Section 3 contains a review of relevant literature covering the fundamental frameworks of business models and BMI. Section 4 outlines the chosen methodological approach, case selection, and data collection and analysis procedures. Section 5 describes the four case studies. Section 6 is dedicated to the presentation and explanation of the results and findings. Section 7 discusses the findings, and the final section makes conclusions regarding policy, research contributions, and future studies.

2. Empirical Background for the Study: Small and Medium-Sized Enterprises in Bolivia

Bolivia is classified as a lower middle-income economy according to the World Bank (2023). The economy predominantly relies on the exploitation of natural resources, which has resulted in stagnation and a notable level of unemployment (Rhij et Cristina and Rivera Chacon 2023). Due to the absence of strong market institutions, Bolivia has developed a large informal economy, characterized by clandestine activities such as street vending and others (Dana 2011). When the absence of these institutions is common, it is normal to observe a high proportion of clandestine activities. This contributes to the informal economy persisting with various popular and parallel situations, as individuals avoid bureaucratic paperwork and tax payments (Dana 2011). With limited formal employment opportunities available, informal self-employment stands as a primary source of income for the disadvantaged population, who discern opportunities in small retail and distribution (Garcia-Agreda et al. 2022). Family-based urban subsistence entrepreneurs engage in various daily small-scale activities within competitive local markets, including but not limited to food and beverages, textiles and leather, woodwork and metalwork, handicrafts, basic electronics and information technologies, repair services of various kinds, small-scale transport, and construction (Barja Daza 2020).

In Bolivia, both in rural and urban markets, business activities primarily revolve around exploiting marginal market gaps that are not profitable for larger firms (Ferraro et al. 2011). Additionally, these activities capitalize on profit opportunities through informal means, leading to business models that generally lack financial sustainability in the medium to long term (Barja Daza 2020). Dana (2011) describes the traditional Bolivian entrepreneur as navigating uncertainties and contending with unknown returns in an environment where prices and quantities remain uncertain. Furthermore, there are increasing acknowledgments that SMEs’ functions and obligations extend beyond their owners to encompass all stakeholders, encompassing the host community and broader society (Imran et al. 2019).

In Bolivia, most SMEs operate informally, which poses numerous challenges when trying to promote their inclusion in economic growth (Garcia-Agreda et al. 2022). There are social barriers inhibiting the transition from the informal to the formal economy (Dana 2011). Transitioning from informality to formality and striving for increased productivity can be particularly challenging. In this specific context, the high level of informality is due to various factors and activities, including differences in regulatory issues, weak public institutions, and a lack of understanding regarding the benefits of formalization (Ferraro et al. 2011).

One such area of informal economic activity concerns waste picking, common in both Bolivia (Ferronato et al. 2020, 2021) and other lower middle-income countries (Scheinberg et al. 2011). Waste pickers collect solid waste such as plastics, cardboard, and paper, which can be recycled. Surveys have shown that 79% of the households in La Paz, Bolivia use this informal waste collection system, delivering their waste to informal recycling shops or individual waste pickers (Ferronato et al. 2021). The informal waste collection system in Bolivia reduces environmental impacts, adding to local economies (Ferronato et al. 2020). While this informal waste collection system implements a traditional business model for
waste collection by collecting and sorting of solid waste and selling it to local households and small informal firms, the waste pickers have very limited capabilities to innovate and add further value to the collected waste (Ferronato et al. 2020).

Another area of informal economic activity in Bolivia are smallholder farmers and communities living in rural areas where they can grow and harvest unique Andean grains such as quinoa. Typical for natural resources and commodity price volatility, quinoa, becoming a fashionable health food item in the developed world around 2010, demand and prices for quinoa sharply rose during 2010–2014 (Bonifacio et al. 2023). The Bolivian farmers in the southern and central Altiplano responded by expanding production, opening new land areas for quinoa production. At the same time, quinoa production in neighboring countries, e.g., Peru and Chile, also increased, causing increased competition in the world markets and resulting in falling prices (McDonell 2018). Moreover, the new land that had been taken for production during the quinoa boom was abandoned when prices fell, causing soil erosion by wind (Bonifacio et al. 2023). With intercropping of crops such as lupins and co-location of breeding of llamas, these soil erosion problems could be solved (Bonifacio et al. 2023). In addition, diversification of crops growing other unique Andean grains with high nutritional content, such as cañahua and amaranto, could provide more stable income to the farmers and communities (Padulosi et al. 2014). However, the Andean farmers and communities still have very limited innovative capabilities related to these natural resources (Padulosi et al. 2014), unable to innovate their traditional business models of extracting the crops and selling them unrefined.

The country’s efforts to transition from reliance on natural resource exports to a more diversified economy is supported by the long-term plan for economic development titled Patriotic Agenda Bolivia 2025. Universities play an important role in increasing activities aimed at fostering economic and social advancement for SMEs (Acevedo 2018). For instance, a division within the Universidad Mayor de San Simón, a Bolivian public university, has facilitated technology transfer by bridging research centers with SMEs within the local context. Subsequently, cluster initiatives started to be organized in 2007, facilitating collaborative partnerships among SMEs and fostering productivity (Acevedo 2018). This innovative framework has proven successful, particularly evidenced by the establishment of thriving SME clusters such as the Food Cluster Cochabamba, comprising 100 firms, and the Green Technology Cluster, comprising 20 firms.

3. Theoretical Background: Business Models and Business Model Innovation and the Macro Environment

Business model innovation represents a new subject of innovation, which complements the traditional subjects of process, product, and organizational innovation and involves new forms of cooperation and collaboration (Teece 2010; Wirtz et al. 2016; Zott et al. 2011). It is important to note that every enterprise has a business model, whether explicit or not, that is crucial to the success of the organization, whether it is a new venture or an established enterprise (Magretta 2002; Osterwalder and Pigneur 2010).

A business model denotes a structured arrangement of activities that is devised and executed with the overarching goal of delivering a particular value proposition to the customer (Wirtz et al. 2016; Zott et al. 2011). Business models are systems of interconnected elements that firms organize to create, deliver, and capture value (Angelshaug et al. 2023; Foss and Saebi 2017, 2018). Osterwalder and Pigneur (2010) identify the business model as a division of nine building blocks: value proposition, key partners, key activities, key resources, customer relationships, customer segments, channels, cost structure, and revenue structure. Osterwalder and Pigneur (2010) identify BMI as a change in one or more of the building blocks of the business model that are new to the organization. In that regard, numerous organizations are actively seeking novel approaches to conducting their business, particularly in contexts where firms face resource constraints like SMEs located in countries with lower or middle incomes (Sánchez and Ricart 2010).
The academic literature provides empirical evidence supporting BMI as an effective approach for SMEs to adapt their business models, fostering innovation and collaboration in response to the dynamic nature of their environment (Haddad et al. 2020; Heikkilä and Heikkilä 2017; Swasty 2015; Zortea-Johnston et al. 2012). At its root, BMI refers to the search for new logic of the firm and new ways to create and capture value for its stakeholders: it focuses primarily on finding new ways to generate revenues and define value propositions for customers, suppliers, and partners (Casadesus-Masanell and Zhu 2013).

Recent research indicates that while BMI holds promise for establishing competitive advantages and improving firm performance, many SMEs face significant challenges in realizing expected benefits during the innovation process (Latifi et al. 2021). Effective BMI requires SMEs to go beyond their organizational boundaries by integrating both internal resources and external networks (Guo et al. 2017). The development of business models in SMEs is often an informal and unstructured attempt, often shaped by the entrepreneurial experiences and intuitive insights of the owners or leaders (Heikkilä and Heikkilä 2017; Latifi et al. 2021). Limited motivation and insights into the opportunities of BMI in an SME leads to no BMI activity or at best, if externally pressured, to focus on a few value creation innovations (Müller et al. 2018). Key to more successful BMI for an SME is to understand and envision the opportunities by combining value creation innovation with value offer and value capture innovations (Müller et al. 2018). This means that the SME and its managers need to develop innovative capabilities beyond product innovation (Visnjic et al. 2014), i.e., understanding the whole value flow (Attanasio et al. 2022).

Foss and Saebi (2017) hypothesize that the macro environment moderates BMI for enterprises through constraining or enabling factors in society. One such important factor is regulations, which encompass the diverse rules imposed by governmental bodies or authorities. These regulations can affect business model innovations, amongst others, like product safety, labor practices, environmental standards etc. A second factor is informal social institutions including norms, values, and traditions shaping behavior within a given society. Trust, reciprocity, and cultural traditions may be some of the examples. Lastly, environmental uncertainty may be a significant factor characterized by the complexity and unpredictability of factors such as technological change, market volatility, geopolitical instability, natural disasters, and others.

Apart from legal and social factors (Foss and Saebi 2017), the economic and technological resources available to SMEs in a country may be constraining as well as enabling factors for BMI. Comparative and relative advantages in a country compared to other countries represent opportunities for SMEs to exploit (Porter 1990) and innovate their business models. Such economic and technological factors may include access to natural resources, an educated workforce, and government and corporate R&D-activities. For SMEs in general, the scarcity of economic resources and technical capabilities is a common challenge, often demanding external assistance (Latifi et al. 2021). This may involve forming partnerships with other organizations and engaging in research projects and collaborative knowledge sharing (Ibarra et al. 2020). In these settings, and particularly in settings with limited economic and technological resources, business model innovation may claim novel collaborative strategies to effectively leverage the capabilities associated with the parties, looking for connectivity, exploring new value propositions, and developing enhanced governance capabilities (Bashir et al. 2020; Ramdani et al. 2019).

Scarcity of economic and technological resources may, in some instances, represent an opportunity for innovations if the constraints can be overcome. Porter (1990) identified comparative disadvantages, such as lack of certain resources, that if overcome, could turn into competitive advantages. Studies of this phenomenon in developing and lower-income countries have coined the concept of frugal innovation (Hossain 2018, p. 927), defining it as “frugal innovation as a resource scarce solution (i.e., product, service, process, or business model) that is designed and implemented despite financial, technological, material or other resource constraints, whereby the final outcome is significantly cheaper than competitive offerings (if available) and is good enough to meet the basic needs of customers who...
would otherwise remain un(der)served.” However, frugal innovation research seems to focus mainly on low-cost product innovations and less on business model innovation in resource-constrained economies.

In summary, based on prior research, we should expect to see SMEs innovate their business models in a macro environment with limited economic and technological resources, in a direction that would focus on enabling factors such as access to relatively cheap and unique natural resources, while making use of collaborative strategies and other possible positive factors such as legal and social factors.

4. Methodological Approach

For this study, a qualitative methodological approach of four exploratory case studies focusing on SMEs in Bolivia is used. Informed consent was obtained in written form during the initial meeting with the owner or representative of each SME. During this meeting, the research scope was presented and explained. The interviews for the case studies were conducted from April to August 2023, with duration ranging from a minimum of 90 min to a maximum of 150 min approximately.

Exploratory case studies encompass significant elements that draw upon a review of relevant literature, reports, and other studies pertinent to the topic (Yin 2018). A comprehensive understanding of the nature and complexity of the issue at hand is necessary (Yin 2018). Utilizing the exploratory multiple case method is advantageous for preliminary and exploratory investigations, especially when the variables are not yet defined and the phenomenon remains inadequately understood (Ebneyamini and Moghadam 2018). The choice of exploratory multiple case studies was made because there has been limited research conducted in these specific settings.

This methodological approach provides us with the opportunity to comprehensively investigate the innovative advancements within the SMEs’ business models, as well as their subsequent transformation into instances of business model innovation in direct response to the evolving Bolivian landscape. Additionally, it can assist in the development and identification of how the macro environmental context could influence the innovation of business models in Bolivia.

For data collection in this study, we primarily focus on four central dimensions to describe the architecture of the business models of the SMEs participating. This approach follows the categorization proposed by Frankenberger et al. (2013) and takes into account the dimensions of “who,” “what,” “how,” and “why.” This will provide us with a comprehensive understanding of the BMI processes of the SMEs under examination. These dimensions were then related to the SMEs’ changes in their value offers (what), value creation (who and how), and value capture (why). Building on the description of the characteristics of the Bolivian macro environment (see Section 2 above) and the PESTEL framework (Aguilar 1967), we related the case descriptions of the SMEs’ BMI to the macro-level factors that had been instrumental in shaping the SMEs’ business models.

Case Selection and Data Collection

The selection process for conducting the four case studies of small and medium-sized enterprises in Bolivia was established as follows.

a. To have received departmental or national awards that serve as a demonstration of being an innovative enterprise.

b. Qualify as a small or medium-sized enterprise and have demonstrated the ability to innovate their business model.

c. Confirming the availability of historical data related to the activities conducted by the SMEs within the context of cluster initiatives.

Based on these criteria, we identified four small and medium-sized enterprises in Bolivia for case studies. Two of them belong to the Food Cluster Cochabamba, while the other two are enterprises of the Green Technology Cluster. Like most Bolivian SMEs, they extract natural resources and sell them, but unlike most Bolivian SMEs, they refine their
products in different ways to increase their value. Table 1 briefly describes the four SMEs and their business activities.

Table 1. SMEs participating in the study.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Cluster Membership</th>
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<tbody>
<tr>
<td>Enterprise A</td>
<td>This enterprise comprises five business units: one collects plastic waste, the second recycles and produces tubes/bags. The third one grows organic food using recycled plastic tubes. The fourth builds eco-domes with tubes. The fifth manufactures durable cells for roads from recycled plastic. Together, the five units makes up an eco-friendly, integrated production chain.</td>
<td>Green Technology Cluster</td>
</tr>
<tr>
<td>Enterprise B</td>
<td>Bolivian social enterprise transforms used tires into outdoor floor tiles. Specializing in circular solutions and rubber recycling, it promotes local waste revaluation for sustainable construction materials, emphasizing impact, urban innovation, and restoring public spaces.</td>
<td>Green Technology Cluster</td>
</tr>
<tr>
<td>Enterprise C</td>
<td>Founded with cañahua and amaranto producers, prioritizing transparency and equity in traditional ecological farming. The enterprise has evolved, focusing on Andean grains like cañahua for nutritious processed products, catering to diverse tastes, especially for urban consumers, children, pregnant women, athletes, and intellectuals. Products include energy bars and juice powders.</td>
<td>Food Cluster Cochabamba</td>
</tr>
<tr>
<td>Enterprise D</td>
<td>Chuquisaca-based agro-industrial enterprise succeeds in producing and marketing popular food items like ground chili, seasonings, soft drinks, and cereals, enjoying strong local, regional, and national market presence. Pioneering in its field, it boasts distribution networks in cities including Cochabamba, Santa Cruz, La Paz, Tarija, Oruro, and Potosí, and provincial areas.</td>
<td>Food Cluster Cochabamba</td>
</tr>
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In addition to the criteria for case selection, these enterprises possess different types of certifications and employ innovative approaches to consistently enhance and improve the conditions in which they operate. For instance, some enterprises hold ISO certifications and similar, including NB/NM 324:2013 for Good Manufacturing Practices in Bolivia. Meanwhile, other enterprises have the “B Corp Certification” and other relevant certifications.

With the explicit consent of the interviewees, interviews were recorded to minimize data loss. Transcriptions were then transcribed verbatim to acquire interview content and served as a tool for initial analysis. Subsequently, we conducted a secondary review process involving attentive listening and enhancing the interviewees’ statements and vocabulary. This refinement was necessary since the interviews were conducted in Spanish.

We analyzed the data in search of various phrases, descriptions, or words related to the concept of innovation in the business models of the enterprises participating in the study. Whenever we encountered such instances, we made note of them and applied different codes accordingly. Through this process, we identified differing patterns of BMI between the SMEs in the food cluster and green technology cluster. Our objective was to understand how the Bolivian environment could impact the innovation of SMEs’ business models and contribute to the transition of the Bolivian economy.

For this study, when encountering uncertainties, we addressed them following the guidelines proposed by Leuffen et al. (2012). We placed emphasis on using reliable sources, particularly interview data and the collective experiential insights of domain experts (SME owners). Researchers undertook an independent data review process to foster discussions aimed at developing a comprehensive understanding, thereby enhancing the quality of both theoretical constructs and empirical findings.
5. The Four Case Studies of BMI in Bolivian SMEs

5.1. Enterprise A

Enterprise A comprises five distinct units aimed at addressing the issue of plastic waste through collection and recycling. The company uses plastic waste as raw material and transforms it into recycled plastic products. The company is committed to fostering both social and environmental benefits while operating within the framework of a circular economy.

In its nascent stages, the enterprise initially concentrated solely on the manufacturing of pipes using virgin raw materials procured from external sources, subsequently converting them into finished products. However, it later identified a significant competitive advantage in incorporating various recycled materials into its operations. Driven by a recognition of the substantial waste issue within the city, characterized by informal waste collection practices, the enterprise addressed this challenge by integrating selected plastic waste materials into its production process, thereby reducing reliance on virgin resources and concurrently mitigating costs. This initiative not only presented a competitive advantage but also aligned with a social imperative to support local associations, such as small waste picking firms and communities. Recognizing the potential synergy with informal waste pickers, the enterprise formalized partnerships with various social groups engaged in informal waste collection. Subsequently, as the enterprise expanded its operations and required additional raw materials, it engaged in negotiations with both public and private entities. These negotiations encompassed collaboration with the municipal waste management system to procure raw materials, as well as partnerships with private enterprises such as the Cochabamba subsidiary of Coca-Cola, leveraging disused plastic materials for integration into its manufacturing processes.

The company’s core operation centers on recycling food-grade plastics, facilitating their utilization for human consumption, and subsequently manufacturing a diverse array of products. This initiative significantly impacts many families and local communities engaged in waste picking and recycling, providing them with dynamic income opportunities. Furthermore, the company incentivizes waste pickers to enhance their efficiency, thereby reducing the dependence on virgin raw materials.

Following the initial recycling phase, the enterprise utilizes the recycled material to fabricate pipes, bags, and various other plastic products, prioritizing eco-friendly materials such as PET and polyethylene (first business unit). Subsequently, these items are employed in organic food production, optimizing resource utilization such as water through methods like drip irrigation and hydroponics (second business unit). Additionally, these types of plastic products are also developed to produce livestock feed (third business unit). Recycled plastic materials that are not fit for contact with food or drink have been finding applications in structural building, particularly in the assembly of eco-domes (fourth business unit). Another business unit specializes in fabricating durable cells from recycled plastic for constructing long-lasting roads (fifth business unit).

The development of the company shows a transition from a linear economic model to a circular one, underscored by principles of reuse, recovery, and recycling aimed at extending the life cycle of plastic materials. Innovation plays a pivotal role in the company’s activities, product innovation as shown by the five business units, as well as process innovations exemplified through the development of adapted and custom-built machinery in their production workshop. Furthermore, the conversion of plastic waste into food-safe, environmentally friendly material underscores its commitment to sustainability.

The founder and owner is highly aware of the company’s business model and has, through his structuring of the company into five business units, created five different business models, one for each type of product, such as water pipes for public utilities and other industrial businesses, and eco-domes for tourist companies. The structure of five business units also gives tax advantages compared to a unified structure. Enterprise A sells its products not only locally in the Cochabamba area but also nationally. International exports are low, as trade tariffs between countries in Latin America are generally high.
However, the owner has set up an independent company with the same business model in the Dominican Republic to supply the Dominican market with similar products.

The enterprise actively pursues connections with various entities, including different universities, with the aim of fostering collaborations for research activities and attracting talented young professionals and engineers who bring fresh perspectives and innovative ideas to realization. The collaboration with the Unit of Technology Transfer at UMSS assumes particular significance within the framework of the Green Technology Cluster initiative, facilitating the development of diverse solutions in conjunction with research centers. For some of the process innovations, e.g., the custom-built machinery, the company has been given technical support by the university.

5.2. Enterprise B

The company specializes in the manufacture and marketing of sustainable construction materials aimed at creating sustainable cities, with a particular emphasis on the re-use of rubber materials. Its business model focuses on the reutilization of rubber from discarded tires in the fabrication of various indoor and outdoor rubber floors. In addition to providing safety to its users and clients, the company’s value proposition centers on mitigating environmental impact by addressing the issue of improper disposal of rubber waste.

The company’s origin traces back to its participation in the Innova Bolivia competition with a nascent idea, leading to the development of a prototype rubber piece. Initially lacking machinery, materials, or necessary labor for rubber floor production, the company relied solely on knowledge and enthusiasm. At that moment, they successfully presented the first commercial sample, secured victory in the competition, and utilized the ensuing funding to establish an industrial-scale facility for shock-absorbing floor production.

Operating within the framework of the circular economy, the company’s production process involves sourcing its primary raw materials from various local suppliers, including rubber artisans, rubber companies, rubber cultivators, and informal waste pickers of discarded rubber. Following a technological refinement process, the raw material is marketed under the premise of receiving the product at its end-of-life stage for reuse as raw material. With support from a European supplier, the company has enhanced its product offerings and penetrated the national market with uniquely tailored flooring solutions. This success has engendered trust among prominent industrial entities. One notable project undertaken aims to enhance playgrounds, with a focus on ensuring safety for society, particularly children. The company’s inaugural safe children’s park in Cochabamba stands as a testament to this attempt.

Currently, the company’s primary objective is to expand its market reach through floor exports, leveraging existing contacts and actively pursuing opportunities to introduce its sports and industrial flooring solutions to diverse international markets. Reflecting on the company’s evolution, the owner attests, “In 6 years, we transitioned from tile manufacturing to the construction of sustainable cities.”

The company’s strategy revolves around promoting sustainable cities through a distinctive product-centric approach. Supported by a dedicated research and development laboratory, the company innovates products with a view toward nationwide market coverage and efficient distribution facilitated by network partnerships. Moreover, the enterprise is participating in different networks and connections. One important relationship is with the Green Technology Cluster of UMSS, with the idea to develop different research projects and activities, also in the development of new knowledge and technologies, as well as sourcing new young talent such as engineers. In competitive markets, the company prioritizes sustainability and product distinctiveness.

5.3. Enterprise C

This enterprise was established in 1996 in collaboration with producers of cañahua and amaranth under the guiding principles of transparency, equity, and support for traditional organic cultivation practices. Since its inception, it has undergone various stages of
growth. The impetus to work with Andean grains, particularly cañahua, stemmed from the social observation of Andean inhabitants migrating to urban areas in pursuit of better opportunities. Recognizing the natural food resources abundant in the Andean region as potential sustainable solutions, the company aimed to improve economic conditions, particularly in regions where cañahua, quinoa, and amaranth are cultivated.

Cañahua emerged as the primary raw material for producing new, nutritionally rich products tailored to urban consumers’ tastes and preferences, especially targeting children, pregnant women, athletes, and individuals engaged in intellectual pursuits. The company’s objective is to provide accessible alternatives to people facing nutritional deficiencies. To achieve this, numerous formulation tests were conducted to design and ascertain the nutritional value of the products.

The company is deeply committed to the natural food resources of Bolivia, with a long-term vision of utilizing raw materials from both tropical regions and the Andes. Its motto, “We bring the best of the Andes and the Tropics to your hands in the form of healthy snacks; We do it with a team of people eager to promote well-being and harmony with Mother Earth,” reflects this commitment.

Future prospects entail exporting cañahua products, leveraging its current organic certification and Good Manufacturing Practices certification granted by IBNORCA, as well as other types of certifications, vital for getting national retail distribution. In the certification processes they have received support from research centers at UMSS in Cochabamba through the activities and networks by belonging to Food Cluster Cochabamba. Over its operational history, the company has received several awards, including the prestigious Golden Seal—National Award for Excellence for Living Well 2014, recognizing its contribution to generating employment, offering quality products, utilizing technology, and environmental stewardship.

The company’s research and development team, in collaboration with experts from collaborations with the university and other companies, focuses mainly on product development. Notably, it has developed various types of cookies, including gluten-free cookies enriched with Andean grains, expected to have a positive impact due to their organoleptic and nutritional qualities. Based in Quillacollo for more than two decades, the company engages in not only raw material collection but also industrial processing, marketing, and promotion within the natural foods segment. Its product line focuses on Andean grains such as cañahua, amaranth, and quinoa, sourced from both Andean and tropical regions, complemented by sesame, chia, flaxseed, and other semi-tropical varieties.

The company underscores the importance of incorporating natural foods into family diets, particularly for children, and has actively participated in local and national exhibitions to display the nutritional properties of cañahua and amaranth through a range of natural products.

The founder and owner of enterprise C has a university education in food and biochemistry, enabling her to understand and develop the chemistry of food ingredients and how they interact in the production process and finished products, as well as safety and nutritional issues. Enterprise C has been given support by the university, particularly when it comes to certification processes for safety and nutritional content, as the university has provided support from certified labs. The certifications are vital to get national retail distribution and for exports.

5.4. Enterprise D

Enterprise D is a family business established in 1963 that initially relied on familial efforts and initiative to pioneer the grinding and packaging of ground chili in wooden envelopes due to the absence of plastic bags at the time. This marked the genesis of the enterprise, with the subsequent formulation and preparation of purple api and yellow api recipes, utilizing ingredients sourced directly for boiling. Purple and yellow api are thick, smoothy-like beverages made from fermented corn and various other Andean food
ingredients. These endeavors propelled the abovementioned product to the forefront, cementing its status as the company’s flagship offering, a distinction it retains to this day.

Early engagements in the 1990s encompassed active participation in national fairs organized by governmental ministries and federations of small producers, facilitating robust business development and networking opportunities at a national scale. This relentless pursuit of excellence facilitated the introduction of a diverse array of innovative products, now exceeding 80 in number.

Firmly rooted in its locality, the enterprise elected to remain in Sucre. Presently, the brand enjoys ubiquitous presence in Bolivian households, a testament to its enduring appeal and market penetration. Subsequent periods saw the introduction of an array of innovative products, including corn soups,lawas, and chuño, utilizing locally available raw materials. Through iterative processes, these raw materials were transformed into a diverse array of products, including the iconic “coconut horchata,” catering to market demands. Diversification further ensued with the introduction of instant preparations such as peanut chicha, quinoa, barley soda, amaranth, and oat horchata, reinvigorating traditional Bolivian cuisine.

In 2020, the completion of new processing facilities equipped with various production plants marked a significant milestone, enhancing the company’s product offerings and solidifying the company’s aspirations into tangible reality. Rigorous adherence to food safety standards is ensured through the acquisition of requisite food safety certifications, in which the enterprise receives the support of the Unit of Technology Transfer through the research centers and laboratories at UMSS, while operational spaces are outfitted with facilities conducive to business expansion.

Over time, concerted efforts were directed towards meeting stringent regulatory requirements, including those pertaining to prenatal and breastfeeding subsidies across seven of Bolivia’s nine departments, underscoring the company’s national outreach. Additionally, efforts were made to establish backward linkages by initiating local production of certain raw materials to enhance value chains. Collaborative agreements with producer associations were forged to procure high-quality raw materials from diverse geographical areas, ensuring compliance with market standards and demands.

6. Results

The findings and the analysis derived from the case studies have been bifurcated into two parts. The first part offers an analysis of the business models, identifying patterns of BMI of the SMEs. In the second part, we examine the impact of macro-level factors on these identified patterns.

6.1. BMI Patterns

The key finding in this study is two patterns of BMI among the four case studies. The first BMI pattern centers on enterprises employing a technology-driven pattern. The other BMI pattern focuses on a market development pattern. Both BMI patterns have been moderated by macro-level factors, i.e., availability of natural resources, the informally organized economy, regulations and access to higher-education resources.

The technology-driven BMI pattern

Enterprises A and B have innovated their business models following a technology-driven BMI pattern (cf. Osterwalder and Pigneur 2010), i.e., basing their new product offerings on the organization’s existing technology and development resources. We identified two key patterns in the technology-driven BMI: (1) a circular approach, and (2) technology and product development.

(1) Circular approach

This BMI pattern builds on the availability of plastic and rubber waste collected by waste pickers and informal recycling shops in Bolivia (Ferronato et al. 2020, 2021). By further sorting of the plastic and rubber waste, for instance, sorting out plastic waste...
approved for food and drink containment such as PET bottles, or other fractions of plastic or rubber waste, the two green technology SMEs (enterprises A and B) have been able to develop new product offerings. To complement the plastic and rubber waste from waste pickers, the enterprises have made deals with companies, for instance, Coca-Cola Bolivia, to deliver disused plastic waste to them.

(2) Technology and product development

The second factor concerns an emphasis on technology to develop new plastic and rubber (polymer) products and applications. Plastic and rubber waste come in many forms and fractions of polymers. Some of them may be used for contact with food and drink, such as PET bottles, and thus may be used to produce, e.g., water pipes. Other forms or fractions of polymers cannot be used for food and drink purposes, but instead are used as, e.g., construction materials in indoor or outdoor environments. To sort and mix polymer waste to create new products with certain properties and qualities requires use of technologies, labs and test spaces to experiment with new materials and products. Both enterprises A and B have invested in technologies, test areas and engineering competence to develop new products based on plastic and rubber waste. Adapting existing machinery to meet the evolving requirements of new products or processes has been key for the enterprises to limit the financial needs.

Market-driven BMI pattern

Enterprises C and D have innovated their business models following a market-driven pattern (cf. Osterwalder and Pigneur 2010), i.e., basing their new product offerings on understanding of specific customer needs like urban consumers, children, pregnant women, and athletes, in order to develop new product offerings, such as energy bars, cereals and seasonings. Moreover, these two SMEs have continuously facilitated the access to these products through an expanding distribution network as well as the convenience of buying and consuming these products. We identified two key patterns to implement customer driven BMI: (3) market focus and customer understanding, and (4) expanding customer access.

(3) Market focus and customer understanding

In the specific context of enterprises operating within the food sector, where resources are often limited, adopting a market-focused approach emerges as a critical strategy for innovation in the SMEs’ business models. By identifying niche markets, these enterprises penetrate specific segments where they tailor their product offerings accordingly. This necessitates conducting diverse market research to comprehend various ideas, customer needs, trends, and competitor strategies, thereby guiding the development of solutions that address unmet needs or gaps in the market. The focus on urban markets with higher buying power than rural areas and large enough customer segments, such as pregnant women and athletes with unique needs, has been key in this market focus process.

Another crucial aspect is enhancing customer understanding, which may have been overlooked previously in the context. Detailed profiling of target customers is essential for gaining insights into their preferences, behaviors, and pain points. Embracing a customer-centric design approach places customers at the core of the innovation process, enabling the development of products focused on delivering customer value and requisite support.

(4) Expanding customer access

The two SMEs have expanded their national distribution network to cover the largest cities in Bolivia, mainly bigger retail stores and/or stores with a healthy food orientation. Having national distribution coverage is unusual among Bolivian SMEs. Moreover, their products come in variants that are easy to buy and consume such as energy bars, cookies, and ready-made seasonings and cereals.
To get access to retailers and other distributors’ food product needs, according to regulations, nutritional ingredients need to be declared on the package. The tests have to be done by government-certified labs, which are often connected to or part of a university organization. In this case, the two SMEs have used the certified lab at UMSS to perform these tests and obtain the certificates. Their memberships in the Cochabamba Food Cluster have facilitated contacts with the lab, as well being offered a discount at UMSS laboratories.

6.2. Macro-Level Factors

The second part of the results relates to the impact of macro-level factors on the BMI patterns presented above. The access to natural resources has been an important and moderating factor in these four SMEs’ original business models and subsequent business model innovation. Bolivia has abundant access to oil, gas, and rubber material, as well as good natural conditions for growing of crops like Andean grains and tropical fruits. Enterprise A started with using virgin plastic material, but soon found that the Bolivian informal waste picking system provided a cheaper and more environmentally friendly sourcing of plastic material. Enterprise B started from the beginning with reuse of rubber material provided in part by informal waste pickers. Both enterprises C and D started their operations buying Andean grains and tropical fruits from small informal firms and rural communities with an idea to provide these with economic support. Thus, connecting to the large informal economy, in these cases the informal waste pickers and the Andean rural communities and small family firms, stands out as another macro-level moderator.

These two macro-level factors, good access to natural resources and reliance on the informal part of the economy, do not differentiate these four SMEs’ business models from most other Bolivian SMEs’ business models. So how come these four SMEs have been able to refine their products and create higher values in their product offerings?

The cases point to two other moderating macro-level moderators, regulations and higher-education resources. While most Bolivian SMEs try to avoid regulations, these four SMEs have tried to enjoy the advantages of adhering to regulations. In three of the cases, enterprises A, C, and D, adhering to food safety regulations has been key to getting access to markets and distribution channels that are close to companies that do not have appropriate certifications for their products. For enterprises A and B, it has also been vital to adhere to regulations in general, as their customers, in part, are public entities and public organizations.

Most Bolivian SMEs follow a traditional business model selling unrefined natural resources. The four SMEs in this study have all put a lot of effort into product development as well as process development (production machinery and equipment). The cases point to the use of higher-education resources, i.e., knowledge from higher education, support from university resources and networks, and sourcing of new educated talent, as enablers of the product and process development activities.

In all four cases, the founder and owner of the SME has a tertiary degree and regularly recruits new talent, mostly engineers, from the universities. In all cases, they have received mostly technical support in various technical development issues. For enterprises C and D, the technical support in the form of certified lab tests has been vital to open up markets that require these certifications.

Derived from the BMI patterns and macro-level factors of SMEs in Bolivia, Figure 1 illustrates the interaction of these factors on the development of new business models for SMEs.
7. Discussion: BMI in SMEs in a Bolivian Context

BMI underscores the importance of understanding and strategically managing the links between different components or modules within a business model and the interconnection to the broader macro environment (Foss and Saebi 2017, 2018). Chesbrough and Rosenbloom (2002) emphasize the interconnected nature of business models, stating that successful innovation involves considering the entire system rather than isolated elements. Resource-limited environments, such as in the Bolivian context, constitute a significant contingency factor for SMEs (Clauss et al. 2021).

Historical, socio-cultural, and economic contexts emerge as pivotal factors influencing the business environment (Dana 2011). SMEs and other organizations often operate independently, contributing to the collective without necessarily considering the effects on other organizations or stakeholder entities. Nonetheless, it is evident that even with partial interconnections between entrepreneurs, SMEs and other stakeholder organizations, tangible benefits can increase for other entrepreneurs and SMEs. This is illustrated in all four cases, as they source their raw materials (plastic/rubber waste and Andean grains) from communities and small firms, creating stable incomes for them as well as providing their customers (distributors, retailers and other SMEs) with valuable products, creating a value flow between the stakeholders involved in the SME’s business model (Attanasio et al. 2022).

Traditionally Bolivian SMEs utilize the macro-level factors of natural resources and informal organizing trying to avoid or minimize following regulations. The four SMEs in this study see the advantages of following regulations and organize their business in a formal way. Formalization of the SME in resource-constrained economies has been shown to increase both investments and profits compared to informally organized SMEs (Rand and Torm 2012). Moreover, their access to and utilization of university resources enables them to develop their products and processes, enjoying the benefits of cluster initiatives (Klofsten et al. 2015).

The technology-driven BMI pattern illustrates how this is done in the Bolivian context. Enterprises A and B have taken advantage of the existing informal waste collection system in Bolivian cities (Ferronato et al. 2020, 2021) and included waste pickers and informal
recycling shops as key partners in their business model, supplying them with plastic and rubber waste. These waste pickers and informal recycling shops receive a stable income and may over time develop and expand their own waste collection business as enterprises A and B are growing and demand more waste for their production. The polymer technology utilized by both enterprises enables them to develop products for several industries as diverse as water and sewage, infrastructure, gardening, construction, and tourism, i.e., the enterprises enjoy economies of scope. Thus, the general purpose technology, in this case the polymer technology, drives the value creation, enabling the enterprises to develop and offer products to customers in diverse industries (Gambardella and McGahan 2010; Visnjic et al. 2014).

The process in the market-driven BMI pattern is different. Long-term purchasing contracts with small family firms and communities in rural areas for unique Andean grains and other natural food items provide these small firms and communities with stable incomes, providing them a better life and stable means to invest in their operations. In a market-driven pattern, it is vital to understand the customers’ needs and the differences in needs between different market segments and develop products that align with these needs (Annarelli et al. 2020). By developing new products for different market segments, such as urban consumers, athletes, children, and pregnant mothers and so on, by varying the mix of ingredients, taste, size of package, distribution and other marketing variables, the two SMEs show a BMI pattern driven by skillful market segmentation and designing new products and marketing activities for these market segments.

Obviously for the two SMEs that follow a technology-driven BMI pattern, the access to engineers and various equipment and testing areas for development of new products based on plastic and rubber waste is key. To a large degree, through their owners and managers with higher education, they have managed to develop and access these resources themselves. However, the access to educated young engineers from the university and some assistance with technical problems from the university research centers has been important to maintain and develop their innovative capabilities.

For the enterprises in the food sector following a market-driven BMI pattern, the use of advanced technology in product development is not so important. However, to obtain distribution through national or regional retailers of food products, national regulations state that their products need to be tested for safety and nutritional contents by certified labs. Universities, such as UMSS in Cochabamba, can provide these services through their certified labs. To expand distribution beyond local and informal markets, a Bolivian SME in the food sector needs to get these lab tests done and their products found safe, as well as be able to declare nutritional values on the package. Instead, they have been following the logic of identifying market niches with specific demands such as urban consumers, athletes and pregnant women, and developing specific higher-value products for these market segments (Annarelli et al. 2020).

8. Managerial, Policy, and Theoretical Implications

Our findings show that SMEs can change their business models in different ways in the same macro environment. We have in this study shown two types of BMI responses from SMEs: the technology-driven BMI and market-driven BMI. Moreover, our findings show that SMEs are able to deviate from the common business model pattern in resource-constrained economies of extracting and selling raw materials.

These findings have important managerial and theoretical implications. From a managerial point of view, there are two implications. First, SMEs in a lower middle-income country context can change their business model in principally two ways, by adding value to their products through the use of technology or by use of marketing activities. The combination is of course preferable, but given SMEs’ general lack of resources, amplified by the lower middle-income macro environment’s resource constraints, the SME maybe better off focusing its efforts one of these patterns, at least initially (cf. Visnjic et al. 2014). Second, to change the business model requires not only investment in time and efforts but also to
add knowledge in order to create new values. The technology-driven BMI pattern requires mainly technological knowledge, such as engineers and learning through technology and product development activities. The market-driven BMI pattern requires added input of marketing knowledge, i.e., knowledge about distribution, logistics, branding, market segmentation, advertising pricing, etc. For both of these BMI patterns, this knowledge may, at least partially, be sourced from the university, e.g., educated persons, lab resources and technology development resources.

In terms of policy for economic and social development, in a lower middle-income country context with a large informal economy consisting of small informal firms and communities extracting and selling commodities, the case studies speak for a cluster view of the economy (Porter 1990) and more concretely the organizing of cluster initiatives (Klofsten et al. 2015) with the university as a leading actor. This cluster approach focuses on supporting SMEs with innovative capabilities that can act as intermediaries between the informal small firms and communities on the one side and the formal economy with its retailers, larger companies, and government on the other side in the value chain.

From a theoretical point of view, there are several important implications. From an ontological and epistemological point of view this study points to two types of studies how the factors in the macro environment shape SMEs’ business models. One type of study views SMEs as “victims” of the country’s macro-level factors, and thus the SMEs must “adapt” their business models to the macro environment. These type of studies follow the logic of contingency theory or alternatively institutional theory (Donaldson 2006). Another type of study views the SMEs as a more “strategic” actor, i.e., the SME and its managers are capable of actively responding to the macro environment and thus to “shape” their business models in different ways. That does not mean that all options are open to the SMEs. There are still restrictions and limits such as laws, cultures, financial and other resources, but the SMEs are able to respond to these in different ways in pursuit of superior performance. This type of study follows the logic of strategic management studies that firms strive for superior performance and competitive advantage (e.g., Porter 1990). Our study is obviously of the second type, viewing the SMEs as a strategic actor. Both types of studies are valuable to increase knowledge on the link and intricate mechanisms of macro-level factors and SMEs’ BMI. A second theoretical implication is that this study shows the opportunity to undertake studies on frugal BMI, i.e., following the logic of studies of frugal innovation (Hossain 2018). However, these studies tend to focus mainly on low-cost product innovations and not on BMI. Frugal BMIs could be an inspiration and source of new business models for SMEs in more affluent economies. A well-known example is the business model for mobile banking pioneered in Kenya in 2007 by the leading mobile phone company M-PESA, the SMS-based money transfer system based on ordinary mobile phones without involvement of banks that quickly penetrated the Kenyan countryside (Jack and Suri 2011) and later inspired banks and other financial firms in affluent economies in the West to develop mobile banking services.

9. Conclusions

The aim of this paper was to explore how four Bolivian SMEs have overcome the gaps in reliance on commodity pricing and productive use of innovation inputs (technology, higher-educated people) by innovating their business models. We were particularly interested in how the SMEs managed to develop their business models in relation to the socio-cultural, economic and technological contexts, i.e., the macro-level context in a lower middle-income country such as Bolivia (Dana 2011).

We found that the four selected SMEs and their BMI processes followed two different patterns: a technology-driven BMI pattern and market-driven BMI pattern moderated by the macro-level factors of availability of natural resources, an informally organized economy, regulations, and access to higher-education resources. Both BMI patterns included the sourcing of natural resources from small family firms, rural communities, waste pickers, and informal recycling shops, i.e., the informal part of the Bolivian economy, as key partners
in their business models. The four SMEs developed product offerings to distinct market segments on a national level and sometimes an international level.

The technology-driven BMI patterns required support from the university in terms of higher-education players, specifically engineers, and support with some technical problem solving. The market-driven BMI pattern required support from the university in terms of certification of product safety and a declaration of content and marketing competence.

Regarding macro-level factors, similarly to most Bolivian SMEs’ business models, the four SMEs in this study utilized the easy access to natural resources and sourcing from informally organized economic activities in waste picking and food production. In contrast to most Bolivian SMEs the four SMEs tried to adhere to regulations, specifically food safety regulations and public procurement, perceiving them as advantages and keys to opening up national and international markets. Utilization of university resources enabled the four SMEs to invest in and develop new products and processes.

This study is inspired by the call for research by Foss and Saebi (2017) and Wirtz and Daiser (2017) to better understand how macro-level factors shapes SMEs’ BMI processes in a context of lower middle-income countries. In such countries, the economy is to a large part based on extracting and selling natural resources as commodities, often with large price fluctuations and an informally organized economy with small informal firms and communities with very limited innovative capabilities. In this study, we show how the four SMEs through their BMI have included the informal economy of waste and rubber picking and informal recycling shops, as well as small farmers and communities of natural food products, in their business models, adding value to these commodities through a technology- and market-driven BMI process, supported by the access to and use of university resources.

This exploratory study examines how different aspects of the Bolivian macro-level environment impact business model innovation in a multiple case study. The findings suggest significant links between the Bolivian macro-level environment and business model innovation, indicating that these links influence how SMEs innovate their business models. It also shows that given an understanding by the SME of how BMI drives development, growth and competitive advantage, the SME can deviate from the common BMI pattern in lower middle-income countries of extracting and selling raw materials. Even though our exploratory study has produced some interesting results, we have to acknowledge some limitations of our research. Our results are based on a selected number of Bolivian SMEs. Our results should be integrated with additional multiple case studies and/or larger-scale survey studies to confirm, modify, add to or refute our findings. This could be done by future studies in other lower middle-income countries and other industries. Future research should provide a more comprehensive understanding of the interplay and shaping effects between macro-level factors and business model innovation in SMEs to fully address the call by Foss and Saebi (2017) and Wirtz and Daiser (2017) to better understand how macro-level factors shape SMEs’ BMI processes.

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