

CIRCULAR ECONOMY DRIVEN INNOVATIONS WITHIN BUSINESS MODELS OF RURAL SMEs

Inga Uvarova

BA School of Business and Finance, Latvia

Dzintra Atstaja

BA School of Business and Finance, Latvia

Alise Vitola

Hotel School Riga, Latvia

Abstract. *The competitiveness of rural SMEs is low due to economic inefficiency and the lack of innovations. The main challenges faced by rural SMEs are the limited scale, the distance from larger sales markets, R&D and business support institutions, and the lack of innovative spirit. The circular and bio-economies are shaping the rural SMEs towards the environmentally friendly and eco-efficient production, the minimization of the generation of waste and less use of natural resources. This potential of the adoption of new business models within rural SMEs is not fully observed.*

The aim of this research is to analyse the opportunities of rural SMEs in introducing the innovative business models driven by the circular economy. This research explores the innovative business models of rural SMEs that transform the environmental challenges in business opportunities and keep a balance with the growing consumption needs. The results of the research are of both theoretical and practical value, providing recommendations for facilitation of innovative business models within rural SMEs. The research methods: desk research, statistical analysis, a grounded theory approach, case study, primary data gathering through seven focus groups with more than 200 stakeholders from six European countries.

Keywords: *business model, circular economy, innovation, rural SMEs*

Introduction

SMEs play a crucial role in the development of rural areas. Besides economic development, SMEs ensure social protection through jobs and income for local people, preserve the environment and the local heritage by using local resources and safeguarding historical production and farming traditions (Tambovceva & Tereshina, 2018; Uvarova & Vitola, 2019).

External drivers force changes in the business environment and the development of the “new rural economy” with more knowledge intensive, globally – oriented, diversified and innovative SMEs. However, rural SMEs face several obstacles, for instance, the small local market and the long distance from

larger development centres, low productivity, insufficient capacity, the lack of spirit for and knowledge of innovations. This hinders opportunities of rural SMEs to increase the competitiveness (Fieldsend, 2013; Tarasovych, 2017; Smallbone, Baldock, & North, 2003; Smallbone & North, 1999; Uvarova & Vitola, 2019).

The circular economy encourages reuse of the materials and extension of the life of products, which contradicts to needs of the linear economy in increasing consumption and production volume. This contradiction inquires the circular economy on what kind of business model innovations can be applied in order to ensure economically justified business performance. Recently, these discussions have appeared on the agenda of politicians, researchers and entrepreneurs, which highlight the importance and urgency of this topic.

The aim of this research is to analyse the opportunities of rural SMEs in introducing business model innovations driven by the circular economy. This paper addresses the following research questions: How the circular economy (CE) impacts business model innovations? What are the challenges and opportunities of rural SMEs to introduce CE-driven business model innovations?

The results of the research are of theoretical and practical value. The novelty of this paper lies in the integration of three scientific disciplines: the CE, business model innovations (BMI) and rural SMEs. Our research shows that rural SMEs lack the understanding of and knowledge about business models (BM) and BMI. This will allow generation of practical recommendations for further promotion of BMI of rural SMEs in line with CE principles and identification of the support necessary. Due to the limitations of this paper, the concepts of sustainability, eco-innovations, rural, bio- and green economies are not described, but still have a significant relation and could be observed in future research discussions.

This paper is structured as follows. The next section presents theoretical concepts regarding the CE, BM, BMI and circular BM. The third section explains the methods and data used. The fourth section presents the results of the research and the fifth section concludes.

Literature review

The theoretical framework includes the interrelation of the concepts and theories of CE, BM and BMI. These elements are explored through a MECO-screening matrix and “BM Canvas” tools, and further united within the circular business model concept visualised within the circular business model canvas.

As regards the CE concept, it responds to the increasing consumption, the decreasing value and the life cycle of products resulting in generation more and more waste. Ellen MacArthur Foundation (2015) defines a CE as “the economy that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times,

distinguishing between technical and biological cycles” and believes that this concept is applicable at any level and on any scale.

In the wider context, the CE advocates sustainability and ecological principles as well as treats the climate change issues. In the narrower context, the CE challenges the increasing production and consumption needs by promoting solutions to the reduction of waste and more efficient use of natural resources in business (Ceptureanu, 2018; Jorgensen & Remmen, 2018; Oncioiu et al., 2018; Costea-Dunarintu, 2016; Bonciu, 2014).

Researchers (Jorgensen & Remmen, 2018) has summarised three most common approaches proposed by the CE: 1) the extension of the product life and production of more durable products that are not losing their technical and emotional values, 2) the recycling, repair and reuse of the resources, 3) reduction of the dependence on fossil fuels by increasing the resource efficiency and narrowing the use of resources, the use of renewable resources.

Drucker identified questions that conceptualise the business strategy and performance efficiency, putting the grounds for further discussions about the business model (Drucker, 1954). Later Magretta (2002) described the business model (BM) concept as a hypothesis of the working definition on how the company offers the value to the particular customer segment and generates revenues from it.

The BM got more significant attention of the researchers and practitioners after introduction of the new methodology “BM Canvas”. The “BM Canvas” defined nine most important BM elements: the value proposition, customer segments, customer relationships, sales or product delivery channels, revenue streams, key activities, key partnerships, key resources and the cost structure (Osterwalder & Pigneur, 2010).

Currently researchers widen, clarify and simplify the definition of BM and its elements. Summarising other researchers (Keane, Cormican, & Sheahan, 2018; Teece, 2018; Foss & Saebi, 2018), the BM can be defined as a simple story of how a company creates, delivers and captures the value to customers, and transforms it into revenue and profit.

Researchers do not have a common opinion about the definition of business model innovation (BMI). Based on other researches, the definition of BMI can be expressed in three ways: 1) the transformation from one BM to another, 2) the creation of a completely new BM or 3) the modification of at least two BM elements (Foss & Saebi, 2018; Geissdoerfer, Vladimirova, & Evans, 2018; Teece, 2010). Other researchers underline multidimensional aspects of BMI by levels of the industry, the enterprise and revenue streams (Giesen, Riddleberger, Christner, & Bell, 2010).

While the CE is challenging global ecological and climate change problems, entrepreneurs explore the narrow context of the CE concept on how to set up

economically and technically feasible business models. Previous researches highlight that the CE increases the efficiency by reduction of costs and potential risks, improves the quality of products and enables new approaches for optimised management and tracking of the production and logistics. This results in the increase of the competitiveness of SMEs. (Jorgensen & Remmen, 2018; Costea-Dunarintu, 2016).

The Ellen MacArthur Foundation (2015) envisages that current technological advancement provides wider opportunities for the development of new scalable CE business models allowing better collaboration, networking and knowledge sharing, tracking of materials, production and logistic chains, increasing the use of renewable energy.

Researchers (Jorgensen & Remmen, 2018) suggest the use of the MECO-screening matrix method, which allows more detailed analyses of the production and logistics through four components to identify the possibilities of introducing renewable energy and use of recycled resources, decreasing the use of chemicals and improving other CE aspects. The MECO-screening matrix can be useful for the critical analyses of at least four elements of the “BM Canvas” – key activities, key partners, resources and cost structure identifying the possible CE features for BMI. The other elements of the BM open discussion about the value proposition and value chain in order to extend the use of materials and products without losing their technical and emotional values (Jorgensen & Remmen, 2018, Oncioiu et al., 2018, Lewandowski, 2016).

As the next step, based on the previous literature review, we have developed an updated circular business model canvas (CBMC), assuming actual trends and tendencies of the CE.

Table 1 Circular Business Model Canvas (created by the authors based on Jorgensen & Remmen, 2018; Lewandowski, 2016; Ellen MacArthur Foundation, 2015)

Key partners	Key activities	Value proposition	Customer relationship	Customer segments
-Sharing of assets and resources (Q&R ¹) -Remove unnecessary waste in the supply chain	-Re-cycle and sort out biochemical from waste -Remove waste in production -Cleaning and refurbishment of used products -Re-think the need of packaging or use bio-plastic	-Functionality instead of ownership -Longer durability of the product as a higher quality element -Promote CE principles on packaging	-Co-design sessions with users to encourage more CE aspects and practices (Q&R ²) -Re-cycling of packaging for new relationship building -Discounts or larger loyalty to customers returning back used products	-More loyal customers -New customer segments, e.g.: Re-used product fans, “Zero

- Introduce a visible tracking system of suppliers	Key resources -Re-use products or their components -Prolong durability through maintenance -Remove chemicals in production	-Possibility to buy re-used products with minor defects, but keeping main quality elements -Product take-back and repair services	Channels -Virtualise sales and usage of products -Access to products without need to purchase a physical product (in line with functionality instead of ownership)	wasters”, “Less is more” believers, healthy lifestyle followers, etc.
Cost structure -Improve efficiency or reduce costs -Reduce losses from risks (environmental pollution, use of chemicals, etc.)		Revenue streams -Turning waste into new products and new revenue streams -New revenue from services instead of products		

Q&R¹ – the sharing economy

Q&R² – the experiencing economy

Methodology

The research was done in seven diverse regions of six EU Member States - Lombardy and Molise regions in Italy, Pardubice region in the Czech Republic, Zemgale region in Latvia, Gorenjska region in Slovenia, Nyugat-Dunantul region in Hungary and Stara Zagora region in Bulgaria. These regions represent Northern, Central and Southern Europe. There are represented less developed, transitional and more developed regions based on the classification of the EU Cohesion Policy. According to the EU urban-rural typology, most of the regions are predominantly rural with the rural population at least 50% of all inhabitants, three regions are classified as intermediate with the rural population between 20% and 50% and in one region (Lombardy), some exceptional parts (e.g. Milano, Bergamo Como etc.) are classified as predominantly urban regions with the rural population falling below 20%. These regions represent diverse economic structures – agricultural regions with a high share of primary (agrarian) production, regions with a significant share of secondary (manufacturing) production and some regions with a highly developed tertiary (service) sector.

The data collection methods used within this research were desk research and case studies. The primary data were gathered through seven focus group discussion meetings of represented regions. The focus group discussion meetings involved in total 215 persons, on average 31 person per each region. The focus group participants was selected based on the diversity principle: 1) representing different fields according to the statistical classification of NACE codes, 2) ensuring multi-level governance – at the local, regional and national levels, and 3) representing stakeholders from the government, business, academic, research

and non-governmental sectors. The focus group discussions were used in order to discuss wider views of diverse stakeholders on the existing bottlenecks, opportunities and further needs of rural SMEs in the adoption of CE BMIs. All focus group discussion meetings followed one common facilitation approach in order to gather unified and comparable data, views and information from each represented region.

Statistical analysis was used for processing the quantitative and statistical data. The case studies ensured more exhaustive analyses of the best practices which are presented in this paper. A grounded theory approach with axial and selecting coding principles was used for the qualitative data analysis of the results of all focus group discussion meetings. The research of this paper is based on the theoretical framework designed by the authors of this paper and described above.

Research results

The research results show that rural SMEs lack the knowledge about the BM, its elements and BMI related aspects. However, through the case studies we found good examples of BMIs in some rural SMEs. These BMIs were introduced as the response solutions to risks threatening the business, for instance, the lack of a workforce, the decrease of a number of customers in local customer segments, the decrease of productivity and profitability. This may lead to an optimistic belief that the CE serves as an important driver for BMIs in rural SMEs if appropriately facilitated by some support initiatives.

The experimental observations of the focus group meetings show that just 2 out of 7 regions constituting approximately 30 % of all the stakeholders were able to give feedback and score the most possible BMIs that potentially could be introduced within rural SMEs. The development of the diverse cooperation forms of rural SMEs is one of the most recognised potential BMIs. This may be related to the historical traditions of farmers or agricultural cooperatives. In relation to the CE principles, stakeholders may assume the sharing of resources or assets, the collaboration within supply chains and in R&D (research and development) activities.

The stakeholders of the focus group meetings felt more comfortable talking about innovative production technologies and the diversification of products, as they had some background knowledge on that. It is positively that the stakeholders were the most familiar with the new technologies having relation to CE principles, in particular, organic farming and biotechnologies, the nonchemical crop resistance system, precision farming, selective breeding and feeding. The stakeholders were less familiar with the concept of “functional use” within the value proposition, for instance, functional food.

However, the experimental observations of the focus group meetings show that rural SMEs were in more favour of traditional business and farming approaches, in general avoiding innovations and new technologies. The stakeholders agreed that they would prefer continuing the historical production and farming traditions, and just critical and major external threats might force them to adopt new innovations and technologies. Rural SMEs lacked the dynamic capabilities that are an essential internal driver for innovations. We already described this aspect in more detail in the previous paper (Uvarova & Vitola, 2019).

Furthermore, the focus group meetings highlighted other factors influencing the readiness towards innovations. The rural entrepreneurs of younger generations (Q&R: the generation Y and Z) born and grown up within the digital era were more open towards new and smart technologies, for instance, adoption of the IoT (Q&R: Internet of Things) and smart metering systems, while older generations rejected these possibilities.

It is positively that the rural SMEs, especially agricultural producers, felt comfortable with the idea of recycling, the use of renewable resources and the decrease of chemicals in the production process. However, the stakeholders were in the common agreement that such CE BMIs require large investments, but the rural SMEs lacked the credibility to attract financing. More targeted public support would stimulate the adoption of such CE BMIs.

The rural SMEs were ready for the introduction of traceability systems within the logistics and production processes in order to improve their visibility, efficiency and productivity. The rural SMEs did not recognise the relation of the traceability system with the possibility to develop the CE driven value chain, the value proposition and the customer relationship. This might be the consequence of the lack of knowledge about the BM.

There were best practices identified through the case studies that can encourage other rural SMEs in adopting CE BMI. The stakeholders of the focus group meetings and interviews stressed the need of the networking and knowledge sharing among the rural SMEs in order to facilitate the adoption of CE driven BMI.

The farm “Ligo” (Latvia) deals with grain production, biogas production and greenhouses. This entrepreneur started with grain production, but forced by significant external threats related to unstable prices and the demand of the grain stock market, took the decision about the diversification of the business with a higher value added. This farm has built a biogas station, which produces heat for the greenhouses. The planted corn is the main biomass resource for the biogas station. Other alternatives to the biomass resource are tested, for instance, specific beets with higher energy intensity, allowing increasing the efficiency and the productivity. This farm is planting cucumbers in greenhouses. A BMI,

distinguishing it from competitors, is that key products of the greenhouses are seeds of cucumbers that are sold to a global multinational agro-production company. Moreover, to minimise the dependence on one global B2B customer, this farm is planting spinach and asparagus for other market segments. In the nearest future, this farm is planning introduction of drone technologies for the smart metering and monitoring of plants and self-driving tractors and other machinery (LA.lv, 2017).

The company Sybimar LLC (Finland) introduced a “zero” waste production cycle. This enterprise combines the production where nutrients, water, waste, heat and CO₂ are recycled back to energy and food. Sybimar produces bioenergy, which ensures heat for a fish farm and a greenhouse. The fish farm uses indoor pools and the closed cycle water recirculation system. The leftover water of the fish farm is further used in the greenhouse for planting herbs. Interestingly that the architectural design of the fish farm and the greenhouse was made in order to minimise the water and heat flows in between both. The fish farm is grounded in the basement under the greenhouse. Moreover, Sybimar LLC produces the biofuel from the leftovers and waste of fish and biomass. Most of the fish breeding processes on the fish farm are controlled and managed by an on-line management and traceability system. This system improves the efficiency, as it requires fewer employees and allows the management processes on-line from the distance in 24/7 mode (Sybimar, [s.a.]).

The Italian company OCA SFORZESCA is operating in the food production industry, in particular, it produces meat products of geese. This company has introduced a number of technological innovations. Moreover, it has introduced new approaches and practices forming BMI.

This company has developed an integrated on-line production chain and the product traceability system. This system allows tracing the production process starting from the delivery of resources from the particular farm through to bringing the product to the customer. This increases the value proposition and provides new possibilities to build the relationship with more loyal customers. All the processes can be managed and controlled from distance using digital technologies. The traditional handmade food production is combined with a modern food quality management system. Other CE BMI applied, mainly focusing on the increase and capture of the value proposition, are as follows: 1) all the products are certified, as 100% goose meat and meat products are handmade, 2) the origin certification and the traceability system shows the area where the geese were reared and fed properly with corn and soy, 3) the nutritional analysis certification for the low content of saturated fat and salt. To extend the international sales market, this company is producing halal meat products for the specific customer segment of the United Arab Emirates.

Conclusions

Responding to the environmental, ecological and climate change challenges, the CE has become significantly important by revolutionary shaping the society, the environment and the business with conflicting needs and benefits. The society and businesses are willing to increase the number of products produced and consumed, which generates more waste. The CE changes the perception by increasing the value and the durability of the products, thereby contradicting the traditional business approach within the linear economy. CE BMIs are seeking for economically feasible and environmentally beneficial business solutions that were explored within this paper.

This paper has an essential socio economic context, as we explored the opportunities of the adoption of CE BMI in rural SMEs that often ensure the social protection of local inhabitants in rural areas. The introduction of the CE principles within the society and businesses is the priority within the agenda of politicians, researchers and practitioners. This concept has a widespread trend in the sectors.

This paper constitutes cross sectoral research through combining the theoretical concepts of different disciplines – the CE, BM, BMI and the competitiveness of rural SMEs.

The research results are multi-dimensional, stretching towards different government levels. This paper identified fields of support needed for successful adoption of CE BMIs within rural SMEs, which can be best ensured through effective multi-level governance mechanisms. Referring to the rural and urban dimensions, the research results highlight serious underdeveloped internal and external factors putting unfavourable conditions for the rural SMEs, compared with their urban peers.

The main concerns identified in this research are a lack of knowledge and understanding of the BM and CE BMIs, the reluctant interest, a lack of dynamic capabilities and motivation for the adoption of innovations within rural SMEs. The weak credibility and financial capacity is a hindering factor for the attraction of investments for adoption of new technologies.

Rural SMEs feel comfortable with the traditional business or farming approach and lack motivation to introduce CE principles and CE BMIs, which highlights an important further challenge.

This research highlights the fields that need further investigation, for instance, the creation, delivery and capturing of the CE driven value proposition, as well as the interrelation between CE BMIs and sustainability, eco-innovation, bio- and green economies.

Acknowledgements

This research was prepared within the project “Regional policies for innovation driven competitiveness and growth of rural SMEs – INNOGROW” funded by the European Union under the Interreg Europe programme. The preparation of this article has been funded by the research project “Perspectives of the circular economy within Baltic states” of BA School of Business and Finance, Latvia.

References

- Bonciu, F. (2014). The European Economy: From a Linear to a Circular Economy. *Romanian Journal of European Affairs*, 14(4), 78-91. Retrieved from http://rjea.ier.ro/sites/rjea.ier.ro/files/revista/RJEA_2014_vol14_no4_site.pdf#page=79
- Ceptureanu, S.I., Ceptureanu, E.G., & Murswieck, R.G.D. (2018). Perceptions of Circular Business Models. *Amfiteatru Economic*, 20(48), 310-324, DOI: 10.24818/EA/2018/48/310
- Costea-Dunarintu, A. (2016). The Circular Economy in the European Union. *Knowledge Horizons / Orizonturi ale Cunoasterii*, 8(1), 148-150. Retrieved from <http://www.orizonturi.ucdc.ro/arhiva/khe-vol8-nr1-2016/30.%20Anca%20Dunarintu.pdf>
- Drucker, F.P. (1954). *The Practice of Management*. New York: Harper & Row.
- Ellen MacArthur Foundation (2015). *Towards a Circular Economy: Business rationale for an accelerated transition*. The Ellen MacArthur Foundation. Retrieved from https://www.ellenmacarthurfoundation.org/assets/downloads/TCE_Ellen-MacArthur-Foundation_9-Dec-2015.pdf
- Fieldsend, A.F. (2013). Rural Renaissance: an integral component of regional economic resilience. *Studies in Agricultural Economics*, 115, 85-91. Retrieved from <https://ageconsearch.umn.edu/bitstream/149408/2/06-1225-fieldsend.pdf>
- Foss, N.J., & Saebi, T. (2018). Business models and business model innovation: Between wicked and paradigmatic problems. *Long Range Planning*, 51(1), 9–21. DOI: 10.1016/j.lrp.2017.07.006
- Geissdoerfer, M., Vladimirova, D., & Evans, S. (2018). Sustainable business model innovation: A review. *Journal of Cleaner Production*, 198, 401–416. DOI: 10.1016/j.jclepro.2018.06.240
- Giesen, E., Riddleberger, E., Christner, R., & Bell, R. (2010). When and how to innovate your business model. *Strategy & Leadership*, 38(4), 17–26. DOI: 10.1108/10878571011059700
- Jorgensen, M.S., & Remmen, A. (2018). A methodological approach to development of circular economy options in businesses. *Procedia CIRP*, 69(1), 816-821. DOI: <https://doi.org/10.1016/j.procir.2017.12.002>
- Keane, S.F., Cormican, K.T., & Sheahan, J.N. (2018). Comparing how entrepreneurs and managers represent the elements of the business model canvas. *Journal of Business Venturing Insights*, 9, 65-74. DOI: <https://doi.org/10.1016/j.jbvi.2018.02.004>
- La.lv (2017). Latvijas vērtīgākās zemnieku saimniecības. Rekordiste – Vinteru “Līgo”, *Ziņu portāls Latvijai la.lv*. Pieejams: <http://www.la.lv/latvijas-vertigakas-zemnieku-saimniecibas>
- Lewandowski, M. (2016). Designing the business models for circular economy—Towards the conceptual framework. *Sustainability*, 8(1), 43. DOI: DOI: 10.3390/su8010043

- Magretta, J. (2002). Why business models matter. *Harvard Business Review*. Harvard Business School Publishing Corporation. Retrieved from <https://hbr.org/2002/05/why-business-models-matter>
- Oncioiu, I., Căpușneanu, S., Türkeş, M., Topor, D., Constantin, D.M., Marin-Pantelescu, A., & Ștefan Hint, M. (2018). The Sustainability of Romanian SMEs and Their Involvement in the Circular Economy. *Sustainability*, 10(8), 2-19. DOI:10.3390/su10082761
- Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation*. New Jersey, USA: John Wiley & Sons Inc.
- Smallbone, D., Baldock, R., & North, D. (2003). Policy support for small firms in rural areas: the English experience. *Environment and Planning C: Government and Policy*, 21, 825-841.
- Smallbone, D., & North, D. (1999). Innovation and New Technology in Rural Small and Medium-Sized Enterprises: Some Policy Issues. *Environment and Planning C: Politics and Space*, 17(5), 549 – 566.
- Sybimar ltd*. Retrieved from www.sybimar.fi/en/closed_circulation_concept
- Tambovceva, T., & Tereshina, M. (2018). Economic potential of “green” economy in development of rural territories. *Economic Science for Rural Development Conference Proceedings*, 48, 259-267. DOI 10.22616/ESRD.2018.092
- Teece, D.J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40–49. DOI: 10.1016/j.lrp.2017.06.007
- Uvarova, I., & Vitola, A. (2019). Innovation challenges and opportunities in European Rural SMEs. *Public Policy and Administration* (accepted).