NEW BUSINESS OPPORTUNITIES BASED ON SUSTAINABLE INNOVATION

Maja Levi Jaksic[1]

ABSTRACT

The paper deals with sustainability driving forces of new business opportunities. The objective is to investigate sustainability driven innovation as an entrepreneurial opportunity and to further develop the concept of sustainable innovation based on the two main domains of technological and business innovation. Based on the analysis of successful innovative company practices and performance results in the world today, it is found that the sustainable innovative power is the driving force of their success. The dual character and interplay of push-pull relations of sustainable technology/business innovation is argued to be the enterpreneurial opportunity recognized within the new business organization that has led to its competitiveness and success. The analysis also shows that there is a rising number of companies from the less developed, emerging economies among the most successful and innovative companies in the world that recognize business opportunities based on sustainable innovation. Base of the Pyramid (BoP) considerations point to the mass markets needs not yet served by adequate technology products, services and processes that present a challenge and at the same time a business opportunity potential not yet recognized nor exploited to its full capacity.

Keywords: *business opportunity, sustainability drivers, dual innovation*
JEL Classification: *O35, L21, O33*

1. Introduction

Sustainable technology and business innovation, a central pillar of sustainable entrepreneurship, is one of the main forces of sustainable development (SD). In this paper sustainability goals and principles, embedded in sustainable technology and business innovation of an organization, are argued to be the driving force of new business opportinities, firm growth and development. At firm level, it is necessary to reconcile sustainability aspects, simultaneously fulfilling all the stakeholders' needs while reaching profitability and respecting the diversified demands of social goals fulfilment (Adams, 2014; Epstein & Roy, 2001, Levi Jakšić, 2015).

SD is most commonly defined as "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Report, 1987). There is evidence of a rising interest of researchers and practitioners in sustainable technology and business innovations, especially dealing with technology innovation embedded in a business environment that contribute to developing sustainable economies and societies. (Boons & Ludeke-Freund, 2013; Bocken et al., 2014; Rainey, 2006).

Sustainable entrepreneurship deals with the complex sustainability aspects of the main contingencies: business opportunity, technology and business model innovation and organization.

[1]PhD, Full professor, University of Belgrade Faculty of Organizational Sciences, Jove Ilica 154, 11000 Beograd, Serbia, majal@fon.bg.ac.rs,

The remainder of the paper is organized in the following manner: Section 2 explicates the aims of the research with an elaboration of the basic concepts and contingencies of sustainable technology entrepreneurship. It brings into attention the assumptions and the main hypothesis of the research and points to its relevance for Base of the Pyramid (BoP) economies. Section 3 presents the results of theoretical and empirical research of SD dimensions, sustainable business goals and sustainable technology and business innovation principles. It gives argument for sustainable innovation presenting a driver for business opportunity. Section 4 deals with concluding remarks, indicates limitations as well as elements of future research. At the end the References are presented**.**

2. Theoretical background

2.1. Research framework

The aim of this paper is to investigate the character of sustainability factors influencing strategic and operational changes of doing business at the company level.

The basic premise and starting point of the research is that sustainable development of the economy and society is creating an environment where only the sustainable businesses will pertain, succeed and develop.

Following this premise the following assumptions are used in this paper: companies play a central role in achieving sustainable development, indicating high relevance of the research in sustainable business growth and development factors, and sustainable technology entrepreneurship leads to the growth and development of firms.

Based on the listed assumptions, and focusing sustainable goals as entrepreneurial opportunity, the research is oriented at two main research hypothesis and goals:

1.the crucial dimensions of sustainable development are translated into sustainable business goals and principles of sustainable business and technology innovation, and

2. sustainable innovations are the drivers of new business opportunities and are of special significance for BoP economies.

2.2.Technology and innovation Entrepreneurship

The definitions of entrepreneurship vary in scope, focus, research objectives and domains. Entrepreneurship is described by terms “new, innovative, flexible, dynamic, creative and risk taking” (Coulter 2001, p.3). Special significance and emphasis is given to the perspective of creating new business organization. (Dollinger 1999) and on creativity centred on four issues: 1. the creation of new ventures and organizations, 2. creation of new combinations of goods and services, methods of production, markets and supply chains (Schumpeter 1934); 3. creative recognition of new and existing opportunities; 4. creative (cognitive processes, behaviour and modes of action) to exploit new and existing opportunities. (Meyer et al., 1999)

Emphasizing risk, entrepreneurship is also defined as “an ability to recognize and a risk-willingness to exploit entrepreneurial opportunities”. (Ulhoi 2005)

Technology entrepreneurship focuses technology innovation as the competitive force. It is oriented at building strong links between scientific results, new technologies, learning and bringing new value to the customer in the form of andvanced products and services brought to the market. Technology enterpreneurs have a task to bring together the technical world and the business world in profitable way. (Byers et al, 2011, Etlie, 2000)

Sustainable technology entrepreneurship is strategically related to the aims of decreasing and diminishing the harmful influence of business operations on the environment while simultaneously fulfilling the economic and social goals, more specifically translated into the fulfillment of the needs of all the stake-holders. (Rainey 2006)

A business model is a conceptual tool to help understand how a firm does business and can be used for analysis, comparison and performance assessment, management, communication and innovation (Osterwalder & Pigneur, 2005). Also, a business model is used as a plan which specifies how a new venture can become profitable (Boons & Ludeke-Freund, 2013) and it describes "how companies create and deliver value to their customers and how they get rewarded for doing that" (Mendelson, 2014; Callon et al., 2007). The relevance of business model innovation in delivering greater social and environmental sustainability is increasingly recognized (Bocken et al., 2014). In this paper a business model is defined by three elements: value proposition, value creation, and delivery and value capture (Sempels & Hoffman, 2013; Boons & Ludeke-Freund, 2013).

Technology innovation is approached by adopting the OECD definition: "Technological product and process (TPP) innovations comprise implemented technologically new products and processes and significant technological improvements in products and processes. A TPP innovation has been implemented if it has been introduced on the market (product innovation) or used within a production process (process innovation)". Following this definition, 'product' comprises not only manufacturing output, but also services (Cetindamar et al., 2009). Business model and technology innovation are inseparable as briefly stated by Chesbrough (2014)"Innovate the business model, not just the technology" and in this paper it is argued that sustainable technology innovation is inseparable from sustainable business development. (Levi Jaksic, 2015).

2.3. BoP considerations

In recent works special attention is given to Base of Pyramid (BoP) and transition economies with focus on a set of specific aspects of sustainability that are critical to their efficient and effective development.

The new business model is rapidly being developed in emerging economies (e.g.well known example of Gramen bank, or Tata Motors of India with Nano – the world's cheapest car). Technological innovation driven by «frugal use of resources through a new combination of existing component technologies created a new modular product to acieve the unique price-performance requirements demanded by the BoP.» (Ray&Ray, 2011)

In circumstances of «limited economic resources, scarce employment opportunities, abundance of unskilled labour, low levels of technological know-how and insufficient governmental capabilities» (Bardy& Massaro, 2013., p. 140) present in BoP economies, it is the logical response to these circumastances to address all the listed problems and search for solutions by integrating the economic, social and ecological dimensions and goals. It is in the context of «developing economies in the world of emerging nations» where the sustainability issues are beginning to play an increasingly significant role. (Bardy& Massaro, 2013)

The BoP mass consumer needs can be satisfied by low performance technology as «firms often add features (speed, power, etc) to products faster than customers' capacity to absorb them.» (Schilling, M., pp. 58). It is argued that while both the trajectory of technology improvement and trajectory of cutomer demands are `upward sloping`, the former is steeper and often requires learning on how to use new features and adapt their work and life styles.

Introducing concepts of market segmentation as high-end and mass market it is shown that the mass market is very often not served in the situation of steep high performance technology trajectory improvements. This gap (Figure 1) clearly shows an open space for adapting technological innovation serving the mass low-end market needs. Sustainable technological breakthroughs noted in emerging economies is addressing these market segments and the orientation at serving the mass market needs in frugal circumstances has already shown results. These innovative, sustainable solutions represented by the sustainable technology trajectory B (Figure 1), oriented at frugal innovation have shown potentials for the high-end market in view of their sustainability capacity. «The overlooked, undeserved and seemingly profitable end of the market can provide fertile ground for massive competitive advantage». (Grove, 1999, p.11) The same is true for the new, innovative, sustainable business models.

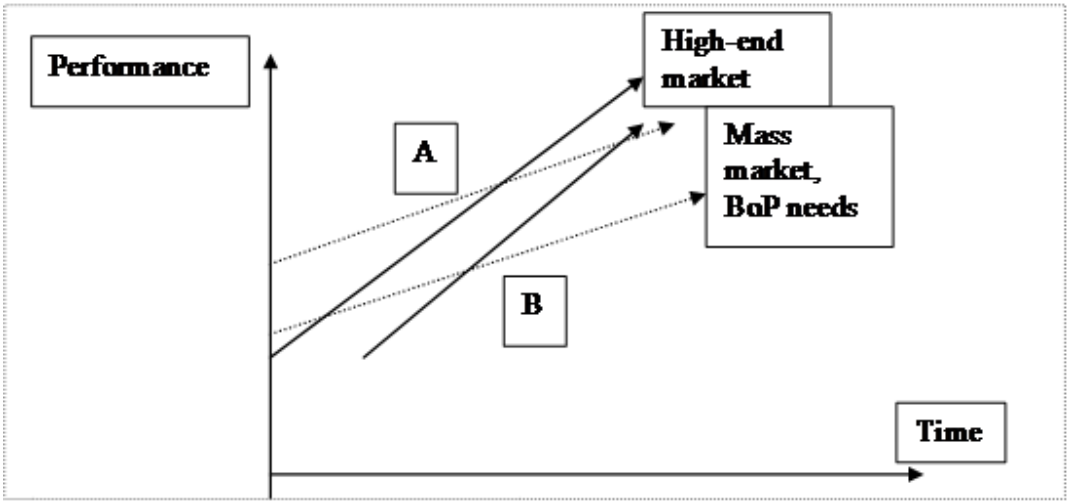

Figure 1. High performance Technology A and Sustainable technology B intersecting Mass market trajectory serving the BoP needs (Adapted from M. Schilling, pp 58)

3. Results

3.1. Sustainable business goals and principles of sustainable innovation

Sustainable business competitiveness means the achievement of a set of different goals – economic and non-economic – of the firm. Based on complexity, dependency and contingency theories, much effort is made to identify and select priorities by relevance criteria attributed to factors influencing the concrete business and the specific situation of different firms.

Tables 1, 2 and 3 show the results of the theoretical and empirical research analysis as the first research hypothesis and goal in this paper, in identifying sustainable development dimensions, sustainable business goals and sustainable technology and business innovation principles, respectively (Levi Jakšić, et al, 2016).

Table 1. Sustainable Development Dimensions

Sustainable Development Dimensions	Description
Circular economy	Defined by the rule of transforming 'waste' into a productive resource and transformation from linear to circular flows in the economy, cited as the "new industrial system that replaces 'end/of life' concept by restoration and regeneration by intention and design" (Sempels & Hoffman, 2013).
Substitute with renewables, alternatives and natural processes	Preserve the natural environment and reduce the exploitation of scarce natural resources.
Minimize consumption	Overall change of attitudes and behaviour of all the actors in the economy and society, based on a new philosophy of economic and social relations. It is also defined as solutions actively seeking to encourage sufficiency based business models reframing the value proposition to better address the broader range of stakeholders (Bocken et al., 2014).
Maximize social and environmental (S-E) benefit	Establishing S-E benefit/cost relationship, with efforts at maximizing S-E benefits and minimizing S-E costs based on rethinking and reconsideration at a global scale the principles and models that have been developed in the traditional approaches and applied in practice.
Positive work experiences enhancing creativity & innovation	Enhancing human creativity and skills is emphasizing the satisfaction of working population as the driving force of creativity and innovation.
Collaboration and sharing	A new model replacing aggressive competition as a quest for more integration and cooperative solutions in the activities of the agents in the economic system. It means strategic orientation towards the BlueOcean strategy (Sempels & Hoffmann, 2013).
Factor 4	Described as a new form of progress - resource productivity, the concept introduced by Von Weizsacker, Lovins and Lovins (1997, 1998) stating that the amount of wealth extracted from one unit of natural resource can quadruple. It is defined as a strategy of halving resource use and doubling wealth. (Bardy & Massaro, 2013).

Source: Original work

Table 2. Sustainable Business Goals

Sustainable Business Goals (SBG)	Description
Max. material and energy efficiency	Enhancing material productivity, resource efficiency and waste reduction.
Create value from waste	Waste is eliminated by turning waste streams into useful and valuable input to other production and making better use of underutilized capacity**.**
Zero waste & emissions	A goal that sets high business operations quality management standards and procedures
Deliver functionality rather than product ownership	A strategic goal to provide services that satisfy users' needs without having to own physical products (Bocken et al., 2014)
Stakeholder satisfaction	A goal that identifies the interests of firm's various stakeholders and articulates the specific goals and strategy to satisfying these goals.

	(Adams, 2014, Epstein, 2011)
Reduce costs	A general goal reducing all the costs: direct, indirect, hidden, external and publicly imposed (Rainey, 2006).

Source: Original work

Table 3. Sustainable Technology and Business Innovation Principles

Sustainable Technology and Business (T&B) Innovation principles	Description
Open, agile T&B innovation platforms	Open models of technology and business in literature often cited as frugal, lean, sustainable, eco innovation and business models. Open innovation models (Chesbrough, 2003, 2006, 2014) integrate a significant number of players across multiple roles in the innovation process expanding beyond the limits of a single organization.
Cradle-to-cradle	Also referred to as the "idea to idea" and complete "life cycle assessment- LCA" principle (Sempels & Hoffmann, 2013), rests upon a holistic and continuous perspective of innovation.
Use-oriented Product-Service Systems	Based on the transition from products to use- oriented services aimed to redefine the relation with 'tangible' goods, by making them available without transfer of ownership: hiring, leasing, pooling, shared consumption.
Reuse, Recycle	Also referred to as re-manufacture, up-cycle or down-cycle, aimed at reuse of non-renewable materials including fossil fuels, waste and emissions are either avoided or up-cycled. (Bardy & Massaro, 2013)
Eco-efficiency, Eco-design	In a broad manner, for companies means applying the principle of `doing more with fewer resources` and it applies to both products and services. It comprises "reconsideration of the design of a product, a service or a process in order to decrease its environmental impact" (Sempels & Hoffman, 2013)
Value constellation platforms	Reframing the company activity considering the stakeholders in the value constellation instead of the value chain alone (Sempels & Hoffman, 2013).
Decouple product from revenue	Decouple revenue generation from raw materials and energy consumption based on the approach 'guarantee of result' instead of the sale of the means to reach that result, as transition from product to result based integrated solutions (Sempels & Hoffman, 2013).

Source: Original work

3.2. Sustainable innovation drivers of new business opportunities

Sustainable solutions found in the practice of the most successful innovative companies today gives rise to a series of questions concerning the specific nature of sustainability built in their practices. The second research hypothesis and goal oriented at scrutinizing the extent to which new business opportunities are based on sustainable innovation led to the research analysis performed on a sample of 100 most innovative companies registered in the available global company lists (FastCompany, 2015, FastCompany, 2016).

Analysing the innovative companies' reports, the character of business and technology innovations was examined related to their sustainability features, that had contributed to their comapany`s overall success and had brought them on high positions within the ranking lists of the world`s most innovative companies. Based on the model developed by Boons & Ludeke-

Freund (2013) a new expanded model relationship for sustainable innovation is used and the results of the analysis are shown in Table 2.

Table 4. Technology and Business Model Innovation: percentage of existing, new and sustainable solutions in the selected sample

		Business model		
		Existing	New	**Sustainable**
Technology	Existing	0%		**17.53%**
	New	5.15%	14.43%	**17.53%**
	Sustainable	**13.40%**	**4.12%**	**20.62%**

Source: Levi Jaksic, M. et al, 2016.

Table 4 indicates that 45.68% of business model innovations, and 38.14% of the implemented technology, possess sustainability features, while 20.62% innovative companies possess both sustainable technology and business models. Sustainable innovations in the companies add up to the score of 73.20% of the sample when the percent of the companies having at least one sustainable innovation (technology or business model) are added up with those that have both. The resutls point to the high relevance of sustainability goals embedded in technology and business model innovation.

4. Concluding remarks

The leading role of entrepreneurship in the next world economy decade is pointed out and this is a critical issue «confirmed by various experts for many times. (Mortasavi & Bahrani 2012)

Based on Schumpeter's definition of the entrepreneur as an innovator who "creatively destructs" and Drucker's definition of the entrepreneur as "someone who maximizes opportunity", it is argued that entrepreneurial opportunity is based on sustainable innovation of technology and business models.

Sustainable open innovation plays a central role in the entrepreneurial process and is a means to exploitation of opportunity. The relation between opportunity and open innovation is twofold: opportunity is the input for the innovation processes, opportunity being the starting point for ideas on technology and business innovation, and technology and business innovation represent entrepreneurial opportunity.

In this paper research results are presented in the form of listing the main SD dimensions, business goals and sustainable technology and business innovation principles adding to the current research in sustainable business development factors. The research results point to the special role of sustainable business and technology innovation as driving force of business opportunity with special considerations and new perspectives for BoP economies.

Relevance of the research contribution is found in the fact that the research of sustainability at the micro economic level, to the best of our knowledge, had not been given sufficient attention in the current literature. Limitations of the present research and, at the same time, the path of future research, is seen mainly in the domain of using more direct, field measures and conducting a wider empirical research to test and support the main research hypothesis and goals.

References

1. Adams, C. A. (2014). Sustainability and the Company of the Future, In *Reinventing the Company in the Digital Age.* Open mind, BBVA, 411-430.
2. Bardy, R., Massaro, M. (2013) Eco-social business in developing countries: the case for sustainable use of resources in unstable environments, in J. McIntyre, S. Ivanaj, V. Ivanaj, ed. *Strategies for Sustainable Technologies and Innovations*, Edward Elgar, London.
3. Bocken, N.M.P., Short, S.W., Rana, P., Evans, S. (2014). A literature practice review to develop sustainable business model archetypes. *Journal of Cleaner Production,* 65, 42-56
4. Boons, F. & Ludeke-Freund, F. (2013). Business models for sustainable innovation: the state of the art and steps towards a research agenda. *Journal of Cleaner Production*, 45, 9-19.
5. Brundtland Report. (1987). *Our Common Future: Report of the 1987 World Commission on Environment and Development.* Oxford, Oxford University Press
6. Byers, T.H., Dorf, R.C., & Nelson., A.J. (2011). *Technology Ventures: From Idea to Enterprise, 3rd Ed., International Ed*. McGraww Hill.
7. Callon, M., Millo, Y. & Muniesa, F. (2007). *Market devices*, Oxford: Blackwell.
8. Cetindamar, D., Phaal, R. & Probert, D. (2009). Understanding technology management as a dynamic capability: a framework for technology management activities. *Technovation, 29*, 237-246.
9. Chesbrough, H. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Cambridge, MA: Harvard Business School Press.
10. Chesbrough, H. (2006). *Open Business Models.* Cambridge, MA: Harvard Business School Press.
11. Chesbrough, H. (2007). Business model innovation: It's not just about technology anymore. *Strategy & Leadership*, 35(6), 12-17.
12. Chesbrough, H. (2010). Business model innovation: Opportunities and barriers. Long range planning, 43(2), 354-363.
13. Chesbrough, H. (2014). Open Innovation: Striving for Innovation Success in the 21st Century, in *Reinventing the Company in the Digital Age.* Open mind, BBVA,395-410.
14. Coulter, M. (2001). *Entrepreneurship in Action.* Prentice Hall.
15. Dollinger, M. (1999). *Enterpreneurship*, Prentice Hall.
16. Epstein, M. J., & Roy, M. (2001). Sustainability in Action: Identifying and Measuring the Key Performance Drivers. *Long Range Planning,* 34, 584-604.
17. Etlie, J. E. (2000). *Managing Technological Innovation*, John Wiley&Sons.
18. Fast Company (2015). *Fast Company* 50 most innovative companies 2015. Retrieved from: http://www.fastcompany.com/section/most-innovative-companies-2015
19. Fast Company (2016). *Fast Company* 50 most innovative companies 2016. Retrieved from: http://www.fastcompany.com/most-innovative-companies
20. Grove, A. S. (1999) Managing Segment Zero, *Leader to Leader*
21. Levi Jaksic, M. (2015). Sustainable Innovation of Technology and Business Models: Steps Toward Rethinking Technology and Business Strategy. Proceedings ASECU, *Openness, Innovation, Efficiency and Democratization*, Cracow University of Economics, 282-293.
22. Levi Jakšić, M. (2016) Sustainable technology driven innovation and entrepreneurship: prospects for future development, in Eskinat, R., Tepecik, F., eds. *Inclusive and sustainable development and the role og social and solidarity economy,* Proceedings of 12th ASECU, Anadolu University, Turkey, 89 -100.
23. Levi Jaksic, M. (2016)Sustainable Innovation of Technology and Business Models: rethinking business strategy*, South Eastern Europe Journal of Economics – SEEJE*, Fall 2016, Vol. 14, No2

24. Levi Jaksic, M.(2012) Innovation Entrepreneurship for Sustainable Development, in Tipurić, D., Dabić, M, ed., *Management, Governance and Entrepreneurship – New Perspectives and Challenges*, Access Press, Great Britain, 487-508.
25. Levi Jaksic, M., Rakicevic, J., Jovanovic M. (2016) Sustainable Technology and Business Innovation Principles – a comprehensive approach, Proceedings SYMORG, FON, University of Belgrade.
26. Levi Jaksic, M., Marinkovic, S., Rakicevic, J. (2014) Open Innovation and Sustainable Technology Entrepreneurship, in *Entrepreneurship and Innovations as preconditions for Economic Development, Proceedings*, University of Montenegro, Podgorica.
27. Levi Jaksic, M.., Jovanovic, M., Petkovic, J.(2015) Technology Management and Entrerprenership – state, university and industry perfromance, *Amfiteatru, Fostering Entrepreneurship in Changing Business Environment*, Vol. XVII, No 38.
28. Mendelson, H. (2014). Business Models, Information Technology and the Company of the Future. *In Reinventing the Company in the Digital Age. Open mind, BBVA, 2014, 63-83*.
29. Mortasavi, S. H., Bahrani, M. (2012) Integrated Approach to Entrepreneurship – Knowledge based Economy: A Conceptual Model, *Procedia* 41, 281-287.
30. OECD (2012) List *of Indicators of Entrepreneurial Determinants, in entrepreneurship at a Glance 2012*. Available from: http://dx.doi.org/10.1787/entrepreneur_aag-2012-27-en [Accessed: 12 February 2014]
31. Osterwalder, A. & Pigneur, Y. (2005). *Clarifying business models: origins, present and future of the concept.* Commun, AIS 15.
32. Rainey, D. (2006), *Sustainable Business Development*, Cambridge University Press, Cambridge.
33. Ray, S., Ray, P.K (2011) Product innovation for the people's car in an emerging economy, *Technovation 31*, 216-227.
34. Schilling, M. (2013*) Strategic Management of Technological Innovation*, McGraw Hill
35. Schumpeter, J.A. (1934) *The theory of economic development*. Harvard University Press, Cambridge, MA.
36. Sempels, C. & Hoffman, J. (2013). *Sustainable Innovation Strategy - creating value in a world of finite resources*. London: Palgrave Macmillan.
37. Ulhoi, J.P. (2005) The social dimension of entrepreneurship, *Technovation*. 25, 939-946