Global Marketing Strategies of Innovative Clusters: Creating Self-sustained Ecosystems

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Abstract
Innovation through creation, diffusion and use of knowledge has become a key driver of economic growth and provides part of the response to many new societal challenges. However, the determinants of innovation performance have changed in a globalizing knowledge-based economy (OECD, 2001). Innovation results from increasingly complex interactions at local, national and global level among various types of stakeholders – business entities, universities, research institutions, public authorities, etc., clusters being an opportunity for its development. This paper examines international marketing strategies of innovative clusters aimed at creating self-sustained ecosystems from systems theory point of view. The evolution of the original concept of 'business clusters' proposed by Michael Porter (1990) is presented as theoretical background. The notion of innovative clusters as drivers of national innovation systems is considered focusing on the concept of clusters of innovation. The research examines the development of regional ecosystems (Black Sea Region) and their global marketing strategies. The results of a survey of cluster managers from Black Sea Region counties are presented. The empirical contribution comes from the unique comparative data from innovative clusters in five countries and various industries, but at different stages of economic development and positioning in the global marketplace. The author focuses on the dynamics of innovative clusters and the role of knowledge and technology transfer in self-sustained ecosystems.

Keywords: innovative clusters, ecosystem approach, global marketing strategy.

JEL classification: M31, L10.

1. Introduction

Clusters and networks have recently attracted a growing attention from the policymakers. Various initiatives to support cluster creation and development are nowadays widespread in Europe. In the 1970s and 1980s clusters established a strong position in the world market for both more traditional products and high technology products (Isaksen and Hauge, 2002). During the 1990s clusters were widely recognized as important settings in stimulating the productivity and innovativeness of companies and formation of new ventures. The influential writing of Michael E. Porter first on industrial clusters (Porter, 1990) and then on regional clusters (Porter, 1998a) in particular describes the tight relationships between cluster participation and the competitiveness of firms and industries. The most widely used definition is Porter's (1990) who describes clusters as *"... geographically close groups of interconnected companies and associated institutions in a particular field, linked by common technologies and skills. They normally exist within a geographic area where ease of communication, logistics and personal interaction is possible.* At this early stage of *cluster concept* development the focus is placed on the powerful role of geography and the benefits gained from the concentration of companies from similar industries. Following this notion, regional clusters refer to geographically bounded concentrations of *interdependent* firms (Rosenfeld, 1997; OECD, 2001), and may be used as a catchword for older concepts like industrial districts, specialised industrial agglomerations and local production systems. The network concept is often applied to characterise the specific forms of governance based on social relations, trust and the sharing of complementary resources that typifies many regional clusters (Vatne & Taylor, 2000). Hence, a regional cluster approach is becoming increasingly recognised as a

valuable tool to foster economic development. However, traditional regional cluster theory emphasizes the physical components of a cluster, identifying the density of players in a common industry as the critical factor in achieving cluster productivity and economic advantage (Engel, 2014). During the past two decades the importance of tangible assets (i.e., the physical elements of a company or a cluster) continuously diminishes. Due to the rapidly developing digital technology and its broad penetration in business practice and our lives, every company is becoming a technology and data company. It's changing the very nature of every business which demands for a revision of the traditional definition of clusters and their key characteristics.

2. Clusters and ecosystem approach

"Clusters" are a nebulous concept which covers a variety of different business structures – national, regional, or cross-border clusters, clusters of competence, industrial or production systems, innovation systems, clusters of innovation, etc. Over the last few decades, cluster concepts of various types have been an element of growing importance in the economic research agenda (Andersson et al., 2017; Isaksen & Hauge, 2002; Verbeek, 1999). Clusters are today recognised as an important instrument for promoting industrial development, innovation, competitiveness and growth. Although primarily driven by the efforts made by private companies and individuals, clusters are influenced by various actors, including governments and other public institutions at national and regional levels. The policy dimension in clusters remains controversial, however. No single policy instrument applies in all cases. Cluster policies differ from related and partly overlapping approaches, such as Innovation Systems and Triple Helix. It becomes evident that the policymakers should adopt a comprehensive strategy and approach to this field.

2.1. The notion of innovative clusters

According to Isaksen (2001) distinguishing between the three distinct concepts of regional clusters, regional innovation networks and regional innovation systems is especially relevant when discussing how policy-makers can stimulate the competitiveness of cluster firms applying different key drivers depending on the status of the business ecosystem (Table 1).

Table 1. Evolution of regional clusters

Concept	Focal point	Key drivers
Regional cluster	Spontaneous phenomenon	▪ Local spin-offs ▪ Entrepreneurial activity
Regional innovation network	Organised co-operation	▪ Innovation activity ▪ Trust, norms and conventions
Regional innovation system	Planned and systematic phenomenon	▪ Inter-firm collaboration ▪ Institutional infrastructure

Source: Adapted by Vassileva, 2004

The main goal of the innovation networks is to stimulate companies' innovation process by the flow of ideas, information and knowledge within clusters. A step further in the evolution process of regional clusters represents the regional innovation system which consists of two sub-systems, namely (1) the knowledge application and exploitation sub-system, principally occupied by firms with vertical supply-chain networks; and (2) the knowledge generation and diffusion sub-system, consisting mainly of public organizations (Cooke et al., 2000). As firms and products are passing through their life cycles, clusters follow a similar pattern of development. They move through a sequence of phases such as emergence, growth, decline or transformation (Pinch & Henry, 1999).

Table 2. Six stages in the model of cluster development

Stage	Core characteristics	Life cycle phase	Main drivers
1st	Formation of pioneer firms often based on specific local knowledge, followed by new firm spin-offs	Birth and early growth	Local competition
2nd	Creation of a set of specialized suppliers and service firms, and a specialized labor market	Cumulative growth	External economies Cost savings
3rd	Formation of new organizations that serve cluster firms	Real growth	Specialized competence Professional competence Innovative capability
4th	Attraction of outside firms, skilled workers, and fertile grounds for new local companies	Early maturity	Visibility Prestige Attractiveness
5th	Creation of non-market relational assets that foster local circulation of information and knowledge	Late maturity	Proximity between individuals, firms, and organizations Network of relationships "Rich" communication flows
6th	Decline which often is caused by "lock-in" situations	Decline or transformation	Inflexible obstacle to innovation Rigid specialization Resistance to change

Source: Adapted by Pinch & Henry, 1999; Storper, 1997; Harrison, Kelley & Gant, 1996; Grabher, 1993; Porter, 1998b.

The connection between clustering and innovation is associated with sticky knowledge grounded in social interaction (Von Hippel, 1994, cited in Andersson et al., 2004:33). Innovation may take place in multiple settings, and activities, the nexus represented by clusters can help foster innovation in virtually any industry. The range of the concept of innovative clusters and its diversity can be demonstrated by the results on Google Search with a key term "innovative clusters" yielded no less than 29 700 000 pages (0.54 seconds) that matched the query. According to Engel (2014: 9) a discreet definition of the term 'cluster of innovation' (COI) is still lacking and only a vague understanding of the concept as "economic cluster that favored the formation of startups and technology commercialization" prevails. His definition (Engel, 2015:37) about Clusters of Innovation (COI) presents them as global economic "hot spots" where new technologies germinate at an astounding rate and where pools of capital, expertise, and talent foster the development of new industries and new ways of doing business. The key characteristics of COI favour the creation and development of high potential entrepreneurial ventures such as: dynamic mobility of intangible resources (people, capital, and information, incl. IP); increased speed of business development; culture of mobility leading to various patterns of collaboration; development of robust relationships (Engel & del-Palacio, 2009).

Traditional clusters are characterized by industrial concentration. In a COI, industry concentrations certainly may exist, but are not definitive. The industrial concentration is not defined primarily by industry specialization but by the stage of development and innovation of the cluster's components. The increased focus on the innovative clusters reflects a (re)discovery by many academics and researchers as well as policy makers of the importance of the following two topics: 1/ cluster as drivers of the innovation chain; and 2/ specific local and regional resources in stimulating the innovation capability and competitiveness of firms.

2.2. Ecosystem approach to innovative clusters

The ecosystem approach (the term 'Ecosystem Approach' was first applied in a policy context at the Earth Summit in Rio in 1992, where it was adopted as an underpinning concept of the Convention on Biological Diversity [Sustainable Environment, n.d.; United Nations, 1992]) is a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way (Beaumont et al., 2007:253). Stated broadly, the ecosystem approach requires ensuring the integration of social, economic, and environmental demands and pressures. Ecosystem-based management (EBM) has been developed during the last decade using the principles of the ecosystem approach (EA). The first principle states that the humans are an integral part of the ecosystem. The second principle refers to the target of the EA, i.e. the areas which should be identified by ecological criteria. It means that ecosystem approach is place-based. The EA seeks to balance conservation and sustainable use constitutes the third principle. The fourth principle addresses the cumulative impacts, i.e. the combined and incremental effects of human activities. The EBM has been proposed as a benefit optimization and decision-making strategy that incorporates often conflicting development and conservation uses (McLeod, Lubchenco, Palumbi, & Rosenberg, 2005; Barbier et al., 2008: 321).

Several interrelated elements have to be integrated in a common framework to implement successfully the EBM to clusters (Figure 1). The identification of the ecosystem (element 1, Fundamental stage) should be based on performance criteria instead of cluster boundaries. Following the EA principles mentioned above, the cluster ecosystem should be defined in spatial and geographical terms. The second element (Fundamental stage) requires a deep understanding of how the ecosystem is constructed (i.e. its architecture) and how it works (i.e. its dynamics). Both explicit and tacit knowledge could be used to describe the elements of the cluster ecosystem and their interrelations in details.
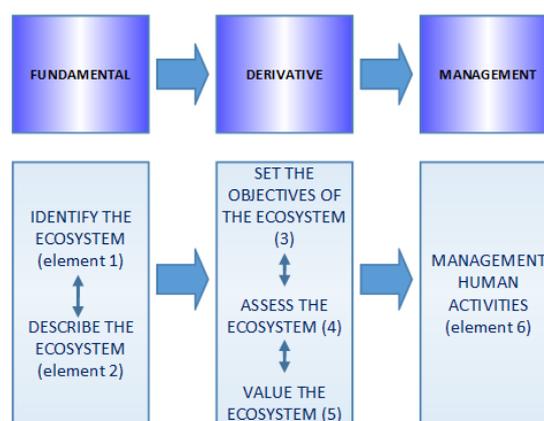

Figure 1. Ecosystem-based approach to clusters

Source: Author's work

Definition of ecological objectives (element 3, Derivative stage) is a critical and demanding EBM component which requires a scientific and holistic view to the ecosystem dynamics. Clusters of innovation, especially those which are digitally-based, are vibrant ecosystems composed of startups, businesses that support the startup process, and mature enterprises (many of whom evolved rapidly from a startup history). In these ecosystems, resources of people, capital, and know-how are fluidly mobile and the pace of transactions is driven by a relentless pursuit of opportunity, staged financing, and short business model cycles. The integrated assessment of the current state of the cluster ecosystem comprises the fourth element (Derivative stage). The monitoring activities consist an inseparable part of the assessment and

they should be used as a feedback loop to provide updated information on the changing states of ecosystem elements and processes followed by corrective and adaptive managements reactions. Valuation of cluster ecosystem, including its goods and services, comprises the fifth element of the EBM of the ecosystem. The final element is the management decisions to regulate human activities in ways that provide benefits from the productive use of resources while maintaining the integrity of the ecosystem.

Since ecosystems exist beyond geographical places, this approach could be successfully applied especially for digital, hybrid ecosystem. Digital ecosystems are networks of companies and consumers that interact dynamically to create mutual value. According to the BCG analyses (Reeves et al., 2017) there is a trend in shifting from the largely digital ecosystems that dominate today to ones richly exploiting both the digital and physical worlds. It is expected that many clusters will pass through a process of digital transformation during their development (see Table2) and will act as pure digital or digital-physical (hybrid) ecosystems. The orchestrators of these hybrid ecosystem must follow some new principles and adopt a set of behaviours different from those that purely digital ecosystems require. By collaborating with new business partners, including industry incumbents and players in other sectors, companies can form new data ecosystems. These ecosystems give their participants access to valuable collective data assets as well as the capabilities and domain expertise necessary to develop the assets into new data-driven products and services (Russo & Albert, 2018). The metrics which will be used during the stages of the EBM process (see Figure 1) should reflect the following key characteristics of COI, namely: mobility and its scope and speed of reaction; entrepreneurial process; alignment of interests, incentives, goals; global ties and bonds - "brain circulation", etc. (Engel, 2015).

3. Black Sea Region and BlasNET members: ecosystem view

The Black Sea region is a contested neighbourhood and the subject of intense debate. This reflects the changing dynamics of the region, its complex realities, the interests of outsiders and the region's relations with the rest of the world. Its strategic position, linking North to South and East to West, as well as its oil, gas, transport and trade routes are all important reasons for its increasing relevance (Commission on the Black Sea, 2010). Despite the diversity of the countries in question in terms of size, economic structure and levels of development, a number of challenges and issues concern the region as a whole. Their measurability is made more difficult by the different levels of integration of the countries into the global economy and the EU. Compare, for example, Greece, Romania, Bulgaria and Turkey with the relatively small and sometimes isolated economies of Moldova and the states of the Caucasus. Then we need to consider the challenges of social heterogeneity, the political system and economic structure of Ukraine and the challenges of economic diversification faced by energy exporters, Russia and Azerbaijan.

3.1. BlasNET situational analysis

Companies are not isolated entities – they exist in a complex network of relationships with suppliers, customers, competitors and public authorities. Successful handling of these relationships can result in a clear competitive advantage. But successful establishment and further rising of the relationships depend on the level of economic development of respective countries. The widely divergent economies of the region make the prospects for economic integration difficult, but deeper and more diversified cooperation is both possible and necessary. Economically, the region was hit by a number of factors including the contraction in global demand, falling commodity prices, a liquidity squeeze and capital outflows. A second round of effects is being currently observed, including increasing unemployment, reduction in

industrial output, declining remittances and other forms of foreign capital inflows, and revelation of institutional deficiencies (Figure 2 and Figure 3).
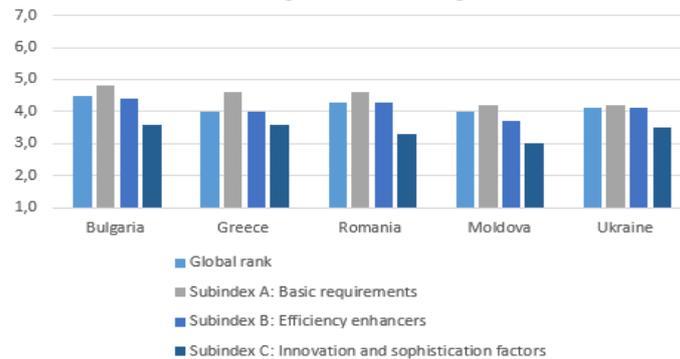

Figure 2. Comparative analysis of BlasNET countries by Global Competitiveness Index, 2017-2018
Source: World Economic Forum, Executive Opinion Survey 2017
Note: The score is calculated on a scale from 1 to 7.

The analysed countries are at different stages of their development ranging from the lower to the highest level. Combined with the challenges which these countries face from the external environment (economic crisis, environmental degradation, financial instability, demographic decline). In line with the economic theory of stages of development, the GCI assumes that economies in the first stage are mainly factor-driven and compete based on their factor endowments—primarily low-skilled labor and natural resources. Companies compete on the basis of price and sell basic products or commodities, with their low productivity reflected in low wages. Maintaining competitiveness at this stage of development hinges primarily on well-functioning public and private institutions (pillar 1), a well-developed infrastructure (pillar 2), a stable macroeconomic environment (pillar 3), and a healthy workforce that has received at least a basic education (pillar 4).
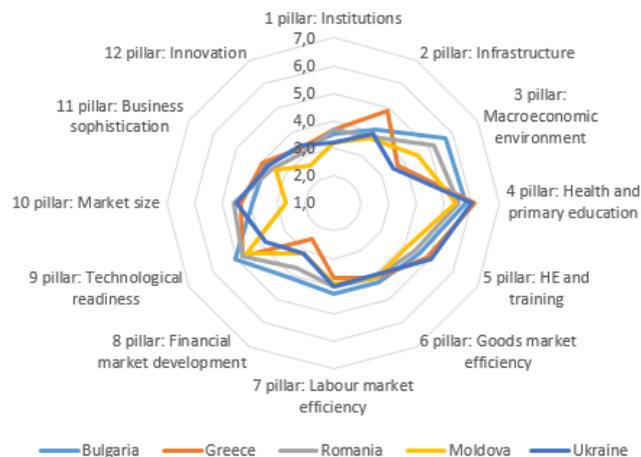

Figure 3. Comparative analysis of BlasNET countries by the pillars of the GCI, 2017-2018
Source: World Economic Forum, Executive Opinion Survey 2017
Note: The score is calculated on a scale from 1 to 7.

As a country becomes more competitive, productivity will increase and wages will rise with advancing development. Countries will then move into the efficiency-driven stage of development, when they must begin to develop more efficient production processes and increase product quality because wages have risen and they cannot increase prices. At this point, competitiveness is increasingly driven by higher education and training (pillar 5),

efficient goods markets (pillar 6), well-functioning labor markets (pillar 7), developed financial markets (pillar 8), the ability to harness the benefits of existing technologies (pillar 9), and a large domestic or foreign market (pillar 10). Finally, as countries move into the innovation-driven stage, wages will have risen by so much that they are able to sustain those higher wages and the associated standard of living only if their businesses are able to compete with new and/or unique products, services, models, and processes. At this stage, companies must compete by producing new and different goods through new technologies (pillar 12) and/or the most sophisticated production processes or business models (pillar 11).

Table 3. Top three problematic factors for doing business

Country	Top 1	Score	Top 2	Score	Top 3	Score
Bulgaria	Corruption	17.8	Inefficient government bureaucracy	12.0	Tax rates	9.3
Greece	Tax rates	20.3	Inefficient government bureaucracy	18.1	Tax regulations	14.1
Romania	Tax rates	13.0	Inefficient government bureaucracy	12.9	Access to financing	11.9
Moldova	Corruption	20.7	Policy instability	13.5	Government instability/coups	9.4
Ukraine	Inflation	16.3	Corruption	13.9	Policy instability	12.1

Source: World Economic Forum, Executive Opinion Survey 2017
Note: From the list of factors, respondents to the World Economic Forum's Executive Opinion Survey were asked to select the five most problematic factors for doing business in their country and to rank them between 1 (most problematic) and 5. The score corresponds to the responses weighted according to their rankings.

The results from situational analysis (Table 4) show that Greece has a leading place among BlasNET members according to the ICT Development Index and Travel and Tourism Competitive Index. Moldova performs worst among the BlasNET country members on GCI and the Networked Readiness Index.

Table 4. Comparative competitive positions of BlasNET country members

Country	Rankings						
	Global Competitiveness Index 2017-18		Networked Readiness Index 2016		ICT Development Index 2017		Travel & Tourism Competitiveness Index 2017
	Value	Rank	Value	Rank	Value	Rank	Global Rank
Bulgaria	4.5	**49/137**	4.1	69/139	6.86	53/176	45/136
Greece	4.0	87/137	4.1	70/139	**7.23**	**38/176**	**24/136**
Moldova	4.0	89/137	4.0	71/139	6.45	63/176	117/136
Romania	4.3	68/137	4.1	66/139	6.48	61/176	68/136
Ukraine	4.1	81/137	**4.2**	**64/139**	5.62	78/176	88/136

Source: World Economic Forum - The Global Competitiveness Report 2017–2018 and Global Information Technology Report 2016; International Telecommunication Union - Measuring the Information Society 2017; World Economic Forum - The Travel & Tourism Competitiveness Report 2017.

BlasNET countries are confronted with different levels of development. It is considered that it will take time to achieve the required level of intra-regional cooperation and trust - a prerequisite for economic stability. That is why, any effort directed toward creation and development of networking activities between the countries in the Black Sea region will stimulate and contribute to economic development of the whole region. Business networks and clusters could serve as good practices from this point of view.

3.2. BlasNET global marketing strategy

BlasNET country members (Table 5) provide variety of services to their members and stakeholders with a focus on SMEs development, innovation and entrepreneurship. They provide similar services but their focus is placed on maritime, ICT and tourism.

Table 5. Distribution of the members of the Black Sea network by countries and by sectors

Country	Total number	General Business Services	Tourism	Research	Maritime	ICT	Trade
Bulgaria	**6**	1	3	1	1		
Greece	**5**	1	-	2	-	1	1
Romania	**4**	1	1	-	1	1	-
Moldova	**3**	2	-	-	-	-	-
Ukraine	**4**	1	2	-	1	-	-

Source: Author's work based on the data collected during the implementation of the project "Black Sea Network for Regional Development" (BlasNET), Joint Operational Programme „Black Sea Region 2007-2013", Contract No 1.1.3.65714.96-MIS-ETC 234–64832/30.08.2011

Despite the promising data given in Table 6, some core issues facing the SMEs in the region are: i) low level of competitiveness, ii) poor export-oriented policies, iii) inadequate quality public infrastructure that raises transaction costs and discourages exports from the region.

Table 6. Cluster characteristics in analysed industries

Industry/ Characteristics	Greece	Bulgaria	Romania	Ukraine*
Size, %:				
▪ IT	0.36	0.72	2.9	0.08
▪ Maritime	5.72	1.00	1.05	0.55
▪ Tourism and hospitality	2.92	1.73	2.11	0.19
▪ Transportation and logistics	2.65	1.48	3.43	1.21
Number of employees:				
▪ IT	5714	11428	46275	23747
▪ Maritime	24942	4343	4569	18683
▪ Tourism and hospitality	85893	50836	62073	48498
▪ Transportation and logistics	126696	70741	164451	660934
Knowledge intensive clusters, number of employees:				
▪ Business services	69546	32561	100482	83792
▪ Education and knowledge creation	53490	41676	19920	65823
▪ Financial services	128128	57854	0	72814

Source: European Cluster Observatory
Southeast European Ukraine

According to the UNDP reports the proximity of the region to the EU, the presence of three EU member states represents a major challenge for the private sector in the non-EU countries from the region. Better access to the EU market can offer an opportunity for sustainable economic development. Many countries also face the task of adapting their regulatory environments, for example, to ensure approximation with EU standards. At the same time, exporters face yet another com-mon challenge in adapting their products to meet EU quality standards, notable in the areas of food safety and environmental protection.

Based on results from the analysis the following three propositions for BlasNET global marketing strategy are provided. Proposition 1: BlasNET should grounded its cooperation activities on innovation and upgrading. There is a promising background for successful cooperation in this field since innovation is a priority for more than 30% of BlasNET members. Proposition 2: BlasNET should provide services covering the whole spectrum of economic activity in general. Many SMEs in Black Sea region face a variety of problems. They need a kind of a one-stop business service provider where they can find a solution for their problems

instead of a list with plenty of specific services. BlasNET could be a hub providing business support to the SMEs from the region. Proposition 3: BlasNET should maintain close mutually beneficial relationships with existing clusters.

Table 7. BlasNET marketing strategy: metrics and milestones

Objective	Activity	Suggested Metrics and Milestones
Objective #1: Identify a differentiated position and strategy for BlasNET and the creative economy in Black Sea region	▪ Develop differentiated positioning for BlasNET, including priority market segments ▪ Identify priority segments ▪ Create a targeted marketing strategy based on BlasNET market segments ▪ Develop action plans to assess / pursue potential opportunities	*Short-term* ▪ List of current BlasNET assets ▪ Identification of target customer segments ▪ Identification of target growth figures *Long-term* ▪ Growth by target market ▪ Growth in employment rate ▪ Growth in export orientation ▪ Growth in level of innovation
Objective #2: Communicate to both internal and external stakeholders that Black Sea region has strong potential for growth in maritime industry, tourism and ICT	▪ Develop differentiated positioning for Black Sea region clusters ▪ Re-brand the region as a nexus for innovative business ▪ Improve awareness of positive regional trends through targeted internal publicity efforts (e.g. job employment opportunities publication)	*Short-term* ▪ Implement marketing / publicity campaign ▪ Development and communication of key messages *Long-Term* ▪ Direct employment and establishment growth in regional clusters ▪ Average wage growth in regional clusters exceeds rate of inflation ▪ Awareness rate (% of population who can identify target messages)
Objective #3: Launch a sophisticated marketing strategy	Develop marketing campaigns to communicate key regional assets	*Short-term* ▪ Implement marketing / publicity campaign ▪ Data-driven prioritization of key issues ▪ Alignment of the efforts between the elements of BlasNET organisational structure *Long-Term* ▪ Focused marketing campaigns targeting key segments ▪ Awareness rate (% of population who can identify target messages)

Source: Author's work

A summary of the main metrics and milestones of BlasNET marketing strategy is provided in Table 7. The BlasNET marketing strategy aims to boost innovation and competitiveness in the Black Sea Region by upgrading the quality of the business environment and organising companies and institutions to take action and better collaborate on common challenges and opportunities. It focuses on encouraging various stakeholders in the region (private sector, government, academia, economic development organisations) to align their efforts in transforming the Black Sea Basin into innovative and competitive region.

4. Conclusion and implications for future research

Cluster policy should correspond to the contemporary cluster profiles especially for innovative clusters. This is particularly important if it is not at the regional level where the essential knowledge is located or where the important learning takes place. Thus, clusters policy could include encouraging more global sourcing of some components, as well as attracting branches

of multinational enterprises into the clusters, if such initiatives are seen to increase the competitiveness of the cluster.

In a digital environment and gigabyte society the market dynamics requires from policymakers to adopt a comprehensive strategy and approach to this field. Further research in the field of implementation of the ecosystem approach to cluster management is required especially for innovative clusters. Attention should be further paid to the specific situation of large versus small economies; centralised versus decentralised government; economies with primarily large companies versus SMEs; differences between industries and sectors; cluster development in traditional and digital ecosystems.

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