



SELECTED ASPECTS OF THE CO-EVOLUTION OF THE POLISH ENTREPRENEURIAL ECOSYSTEM

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Introduction

The concept of ecosystem has its origin in biology, referring to the natural environment and its elements like biotic factors and abiotic factors, which function together as a unit. The concept of ecosystem was adopted, from a business organisational point of view by Moore in 1993, with specific reference to business networks (Nicotra et al., 2018). The concept of entrepreneurial ecosystem consists of two terms: 'entrepreneurial' which is linked to entrepreneurship, which is often understood as a driver of innovation, productivity, sustainable economic growth, and 'ecosystem' generally defined as a system, or a group of interconnected elements, formed by the interaction of a community of organisms with their environment. The purpose of this publication is to determine the overall condition of the Polish entrepreneurial ecosystem and attempt to identify selected co-evolutionary aspects of ecosystem. The research questions are: what is the overall condition of the Polish entrepreneurial ecosystem and what changes in the entrepreneurial ecosystem have affected the current condition of the ecosystem? The presented assessment of the changes taking place and their impact on the entrepreneurial ecosystem, serves to formulate conclusions and identify opportunities for further development of the ecosystem. Entrepreneurship as a driver of innovation, productivity and sustainable economic growth leads to creation of new jobs including a strong component of knowledge and technique. Therefore, the stimulation and support of entrepreneurship and development is imperative to ensure economic growth. Healthy ecosystems are characterised by greater durability (robustness) and have a positive impact on management of enterprise development. There is an increasing number of publications on entrepreneurial ecosystems in the literature, but there is still a lack of indications on the genesis of ecosystem development, its key elements as well as the conditions for further development relating to the analysis of specific ecosystems at a regional or national level. The article presents an overview and is an introduction to further research on the Polish entrepreneurial ecosystem. The presented indexes and aspects of ecosystem co-evolution have been selected from literature review and authors' analysis.

Entrepreneurial ecosystem

Institutional and macroeconomic conditions, structural reforms, supported by social partners, combined with government policies that provide more financial and non-financial support for entrepreneurs and SMEs, are essential for a productive business environment, for increased employment, investment and trade (Altomonte, Békés, 2016, p. 1).

The ecosystems approach is different from industrial districts, clusters and innovation systems concepts because it focuses on entrepreneurs and start-ups as unique organisational entities with different capabilities and resources and on the role of social and economic contexts surrounding entrepreneurial processes (Nicotra et al., 2018).

Literature on entrepreneurial ecosystems (Feld, 2012; Isenberg, 2011; Spigel, 2017) has provided only long lists of relevant factors (eco-factors) characterising successful entrepreneurial ecosystems and their effect on productive entrepreneurship (eco-output) but has not been sufficiently and holistically studied and clear evidence of cause and effect has not been established (Nicotra et al., 2018).

Isenberg (2011) proposes a model (Figure 1), for entrepreneurial ecosystems that is composed of elements that can be grouped into six domains: a conducive culture; facilitating policies and leadership; availability of dedicated finance; relevant human capital; venture-friendly markets for products, and a wide set of institutional and infrastructural supports.

Spigel (2017) argues that an entrepreneurial ecosystem is composed of 11 cultural, social, and material attributes that provide benefits and resources to entrepreneurs, which are: a supportive culture, a history of entrepreneurship, worker talent, investment capital, networks, mentors and role models, policy and governance, universities, support services, physical infrastructure, and an open market.

Roundy et al. (2018, p. 2) working on entrepreneurial ecosystems, propose three related forces that will influence entrepreneurial ecosystem emergence: intentionality of entrepreneurs, coherence of entrepreneurial activities, and injections of resources. According to their observation EEs are complex adaptive systems that should be analysed through complexity science. They developed a framework for the study of EEs by connecting micro-and macro-level research in entrepreneurship.

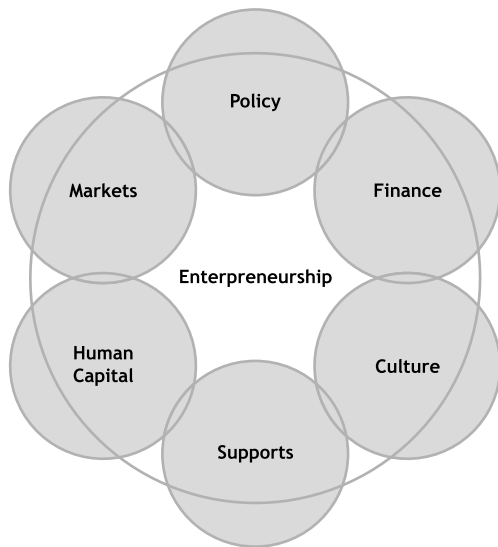


Figure 1. Entrepreneurial ecosystem
Source: own elaboration based on Isenberg, 2011, p. 1

Global Entrepreneurship Index

The GEI is composed of three building blocks or sub-indices: entrepreneurial attitudes, entrepreneurial abilities and entrepreneurial aspirations. These three sub-indices stand on 14 pillars, each of which contains an individual and an institutional variable that corresponds to the micro – and the macro-level aspects of entrepreneurship. These pillars are an attempt to capture the open-ended nature of entrepreneurship (GEI, 2019).

The EE approach differentiates between environmental, ecosystem elements and outcome measures. In this context, the Global Entrepreneurship Index (GEI) has emerged as a relevant EE metric that measures the entrepreneurship system as the complex interactions between entrepreneurial attitudes, abilities and aspirations at country level (Szerb et al., 2019, p. 1309). The ranking includes a comparison of the 137 countries on the Global Entrepreneurship Index.

According to the GEI report, the United States, Switzerland and Canada lead the ranking, while large European countries rank in the middle: France is 14th, Germany is 15th, and Spain is 31st followed by Italy in 36th place (Table 1). While the in the previous year France, and Germany were relatively well balanced over the 14 pillars, Poland, Spain, and Italy were entrepreneurially less efficient. Poland is ranked 29th with a 49.5 score, which is a good result. Hungary changed its position from 50th to the 33rd, primarily driven by the Technology Absorption and the Aspiration index with very strong scores in High-growth Firms, Internationalization and Venture Capital (GEI, 2019).

Poland recorded the weakest result in terms of Competition (0.310), Product Innovation (0.328) and Process Innovation (0.357). The Competition pillar measures the level of the product or market uniqueness of start-ups combined with the market power of existing businesses and business groups. The tendency of companies to innovate is linked to the capacity of technology transfer in a given country and the utilisation of new technologies by start-ups, combined

with national research and development expenditure (GEI, 2019). The pillars of Internationalization (0.786) and Start-up Skills (0.809) were rated the best (Table 2). They concern the internationalization of entrepreneurs in a given country and the ability to start entrepreneurial activity. Start-up Skills are also linked to the quality of education.

Table 1. The Global Entrepreneurship Index rank of chosen countries

Global rank	Country	Score
1	United States	86.8
2	Switzerland	82.2
3	Canada	80.4
14	France	67.1
15	Germany	66.7
29	Poland	49.5
31	Spain	46.9
33	Hungary	46.2
36	Italy	45.1

Source: own elaboration based on GEI, 2019

Table 2. GEI, Entrepreneurial Pillar Values for Poland

Pillars	Pillar Values
Competition	0.310
Cultural Support	0.544
Risk Capital	0.492
High Growth	0.455
Human Capital	0.450
Internationalization	0.786
Networking	0.502
Opportunity Perception	0.583
Opportunity Start-up	0.596
Process Innovation	0.357
Product Innovation	0.328
Risk Acceptance	0.540
Start-up Skills	0.809
Technology Absorption	0.623

Source: own elaboration based on GEI, 2019

Regional Entrepreneurship and Development Index

The systemic approach has long been well-established in theory, but part of both theoretical and empirical entrepreneurship research has focused on the individual and the enterprise, ignoring research into the context, in which they are embedded. Entrepreneurs do not act in isolation from their context, which has a decisive influence on who sets up new companies, with what level of

quality and ambition, and with what results (REDI, 2014, p. 5). A systemic approach to understanding the economic potential of entrepreneurship in regions is particularly important for regional policy, as political initiatives usually address gaps and shortcomings at systemic level.

The REDI indicator consists of three sub-indicators, 14 pillars and 28 variables. The index structure combines variables at individual level with institutional variables, to capture contextual influences, making it extremely useful for profiling Regional Entrepreneurship Systems in EU regions (REDI, 2014). The three sub-indicators: attitudes, abilities and aspirations form the entrepreneurship super-index, which we call the Regional Entrepreneurship and Development Indicator (REDI). Each of the fourteen pillars consists of an institutional and individual variable. The REDI Index shows how entrepreneurship is measured in 125 EU regions.

The level of entrepreneurship of Polish regions is consistent with their economic development. The six Polish regions presented in the NUT1 classification are between 86–88th and 105–106th place in the EU REDI ranking (Table 3). The ranking range is based on the REDI index value calculated to one decimal place. Regions with the same REDI value are classified by providing a range in the ranking. Five of the six regions analysed, scored between 36.1–32.3, indicating similarities in these regions. The lower score was achieved only by the Eastern region – 29.2.

The entrepreneurship profile of regions also shows similarities between the regions studied (Table 4). For all regions, the most restrictive in terms of entrepreneurship are the pillars: Opportunity Start-ups, Technology Absorption and Competition, which are part of the Entrepreneurial Abilities sub-pillar. All three pillars are assigned to the policy priorities category at national level (REDI, 2014).

Table 4. REDI pillar values - Comparison of Polish regions

Pillars	Central Region	Southern Region	Eastern Region	North-West Region	South-West Region	Northern Region
Competition	0.30	0.21	0.20	0.14	0.20	0.15
Cultural Support	0.32	0.28	0.34	0.27	0.30	0.34
Financing	0.21	0.68	0.21	0.63	0.55	0.64
High Growth	0.76	0.76	0.80	0.67	0.67	0.55
Human Capital	0.38	0.22	0.18	0.17	0.26	0.12
Internationalization	0.79	0.75	0.43	0.65	0.66	0.64
Networking	0.48	0.47	0.46	0.51	0.50	0.47
Opportunity Perception	0.50	0.53	0.43	0.45	0.50	0.50
Opportunity Start-up	0.07	0.06	0.09	0.07	0.12	0.10
Process Innovation	0.44	0.17	0.36	0.40	0.31	0.49
Product Innovation	0.95	0.74	0.46	0.52	0.86	0.57
Risk Acceptance	0.45	0.42	0.40	0.44	0.44	0.45
Start-up Skills	0.65	0.58	0.41	0.57	0.49	0.50
Technology Absorption	0.11	0.19	0.10	0.13	0.17	0.11

Source: own elaboration based on REDI, 2014

Table 3. The REDI ranking, REDI scores for Poland

Rank	Code	Region	REDI
86–88	PL5	South-West Region	36.1
86–88	PL1	Central Region	36.1
92	PL2	Southern Region	34.1
94	PL6	Northern Region	33.2
96	PL4	North-West Region	32.3
105–106	PL3	Eastern Region	29.2

Source: own elaboration based on REDI, 2014

The presented REDI index is a modified version of the Global Entrepreneurship Index to measure the entrepreneurial performance of 121 EU regions. Following the EE, the adjustment process, i.e., the movement from GEI to REDI, refers to changes in the institutional variables to reflect the regional forces of agglomeration, connectivity and clustering (Szerb et al., 2019, p. 1310). REDI is a more appropriate and more precise measure of EE than GEI. REDI data is available for the years 2007–2014.

Poland's place in the rankings of entrepreneurship indicates a good health of the entrepreneurial ecosystem. Comparing both indexes, Poland performs worse at the regional level than at the national level. The examination of the three sub-indexes demonstrates the varieties of the regions entrepreneurial characteristics. Most Polish regions seem to have a relatively low performance in entrepreneurial aspirations. According to GEI, areas for improvement are the pillars of competition and innovativeness.

Selected aspects of the co-evolution of the Polish entrepreneurial ecosystem

Ecosystems develop naturally through co-evolution, but with different actions we can influence them and try to design them in an intelligent manner. A proper understanding of the nature of the entrepreneurial ecosystem helps in the design process. Ecosystems are usually a result of intelligent evolution, a process that combines the invisible hand of markets and institutional support to ensure (relative) self-sufficiency. There occurs a common evolution of the system, co-evolution, which is the lifeblood of the ecosystem.

A key change in the ecosystem concerned changes in regulation and the system affecting the policy and leadership domain. The transformation after the fall of Communism required a redefinition of the state's role in the economy. The foundation on which Polish capitalism and prosperity were to be built was a set of rules, of the so-called Washington Consensus, which included, among others, deregulation, privatisation, trade liberalisation and free movement of capital (*Strategy ...*, 2017). A key change occurred in the Polish business ecosystem, regulatory changes enabled the creation of businesses and the utilisation of emerging market niches. The legal acts provided that the establishing and conduct of business is free and is available for everyone equally, and in the sphere of economic activity everything that is not prohibited by law is permitted (Ustawa, 1988; Ustawa, 1989).

Another significant change affecting the Polish ecosystem was **Poland's accession to the European Union**. The impact of this change affects not only the policy area and leadership, but also the domain of support and markets. The European Union is a community of countries that face many challenges by working together. The effects of the EU enlargement in 2004 can be assessed from different perspectives, including a financial perspective. Newly adopted countries have a possibility to operate within the internal market, which affects their socio-economic situation. The EU Member States pay a certain amount of money to the common budget, which is then distributed e.g. in the form of grants to enterprises, subsidies for important public investments or scientific and educational projects – by the end of 2018 Poland had achieved a positive balance of EUR 107.4 billion, which places Poland first among all EU Member States (Ministerstwo Funduszy i Polityki Regionalnej, 2019). This is an advantageous situation for Poland, as it receives more money from the EU budget than it pays into it. Promoting and supporting the innovative activities of the Member States is one of the main objectives of the European Union's economic policy, in which innovation is regarded as a key competitiveness factor (Brzóska, Cierkosz, 2016, p. 12).

The introduction of an internal audit was a consequence of Poland's accession to the European Union in 2004, and the aim of introducing the institution of internal audit into the public finances was to optimise the management of public funds by identifying risks, irregularities and presenting deviations from adopted criteria, which adversely affect

the management of public funds (Emerling, 2015, p. 93). The audit, examining and evaluating the activities of public finance entities, aims to support entities in achieving their objectives by increasing the effectiveness and efficiency of management processes (Waściński, Sławińska, 2013, p. 58). An internal audit is a tool for investigating and evaluating the activities of public organisations to support the organisation in achieving its objectives affecting the efficiency improvements of management processes, and should indicate the possibility of generating a greater result or achieving the same at lower expenditures/costs (Lisiecka, 2012).

Under the culture domain, there occurs a change in the culture of trust. The culture of trust is influenced by the historically accumulated effects of collective experiences from the past of a given society, which can significantly affect individual inclinations to offer trust (Sztompka, 2002, p. 100). Structural factors influencing the culture of trust are normative cohesiveness, transparency of organisations, stability of social order, subordination of power to the rule of law, responsibility of persons and institutions (Sztompka, 2002, p. 318). Societies where high levels of trust and low levels of corruption occur, have better governance, faster economic growth, fairer income redistribution, and citizens show greater respect for the law (Uslaner, 2004).

Transparency International is one of the organisations that deals with the fight against corruption. According to Transparency International, Poland ranks 36th in the international ranking that compares 180 countries, where a country's rank indicates its position relative to the other countries in the index. The score awarded to Poland is 60 points out of 100 possible. A country's or territory's score indicates the perceived level of public sector corruption on a scale from 0 (highly corrupt) to 100 (very clean) (Transparency International, 2018, Poland). More than two-thirds of countries score below 50 in the 2018 Corruption Perceptions Index, with an average score of just 43. Poland maintains a rather stable position: in 2017 it also received 60 points, 62 points in 2016 and 63 points in 2015 (*Transparency International*, 2018, Corruption Perceptions Index).

Adequate **human capital** is crucial for the development of enterprise innovativeness through the creation of high-value-added products and services, which in turn affects the competitiveness of enterprises. From the point of view of the human capital domain, the level of population's education is important, which translates directly into the level of worker skills. In 2011, more than 5.1 million people aged 25–64 had a university degree, of whom about 20% graduated with a bachelor's or engineering degree and about 2% with at least a PhD degree. It follows that in 2011, possessing higher education could be claimed by 2.5 times more Poles than in 1996, and since 2000 the population has grown by an average of 6.6% per year (Kłobuszevska et al., 2012, p. 57). This change is one of the highest in the OECD countries. The data shows that educational achievements are influenced by territorial differences in residence, especially at the level of different administrative regions (voivodships). The educational structure also differs between city and rural residents, but the differences are slowly blurring. Due to the adaptation to the needs of the labour market,



importance is given not only to the level of completed education, but the type of completed studies or the acquired profession. In the academic year 2018/19, 1.230.3000 students studied at universities, which was by 4.8% less than in the previous academic year. Since the academic year 2006/07, there has been a decrease in the number of students due to demographic changes, i.e., an overall decrease in the number of people aged 19–24 (Polish government statistics, 2019, p. 12). The number of university graduates from the academic year 2017/18 was 327,700 and was lower by 15.4% compared to the academic year 2016/17 (Polish government statistics, 2019, p. 12).

The measure of education's universality is the scholarization coefficient. The gross scholarization rate in higher education is the ratio of the number of learners at a given level of education (regardless of age) to the number of citizens in the age group defined as corresponding to this level of teaching (19–24 years). The net coefficient of scholarization in higher education is the ratio of the number of people (aged 19–24) learning at this level of education to the number of citizens in the age group defined as corresponding to this teaching environment (19–24 years) (Polish government statistics, 2019, p. 15).

The gross scholarization rate in higher education in the academic year 2018/19 was 46.2% (Table 5) and the net scholarization rate was 35.6% (0.6 percentage points less than in the previous academic year).

In the support sphere, there are many **acceleration programs** that aim to develop entrepreneurship in different areas. The programs have different sources of funding and differ in their scope of action. The main focus of their activity is to support the development of innovative services for business, technological and organisational solutions, as well as to support through consulting and financing for startups interested in implementations in large companies. Examples of such programs are, for example: Entrepreneurial Mazovia program, start-up accelerator Scale-Up by Entrepreneurial Poland, Start-up Heroes platform for new ideas, Start-up Academy. These projects create beneficial opportunities for the creation and development of innovative enterprises. They also work with local governments across Poland, building ecosystems of innovative companies and services to entrepreneurially stimulate local communities. Supporting individuals, local governments and public institutions in the development of local entrepreneurship, they help large companies to implement techniques for innovation and methods for cooperation with start-ups.

The development of entrepreneurship, also means **entrepreneurship incubators**, combined with practical advice on operating businesses. Emerging venture capital funds invest in innovative entrepreneurs using the knowledge and experience of business angels to identify and support business development. Actions to stimulate entrepreneurship also include competitions for the implementation of innovations and competitions for business plans (e.g. Implementation of Innovation by SMEs competition). Their aim is to finance the production of innovative products or the implementation of innovative technological processes in the company, in particular by implementing the results of R&D by SMEs, operating within transregional cooperative links (PARP, 2019).

Operational programs are documents aimed at implementing the National Strategic Reference Framework and absorption of the EU funds. Operational programs may take the form of national operational programs or regional operational programs. The shape and scope of the operational program is approved by the European Commission. Draft programs are drawn up by the ministers of the Member State. Poland uses a number of programs that pursue specific development goals defined by industry or geographically and thematically. Operational programs influence the growth in scale of innovative activities of enterprises in Poland and have a clear impact on R&D. Compared to the period prior to the EU financing, the number of beneficiaries who undertake internal R&D has grown (Raport Rynek B+R+I w Polsce, 2015). Examples of such programs include: Infrastructure and Environment Operational Program, Innovative Economy Operational Program, Intelligent Development Operational Program. Another element of support, which is offered by the Ministry of Development, is the facilitation package for start-ups.

Entrepreneurship Development Agencies help implement economic development programs supporting innovation, entrepreneurship and research activities of small and medium-sized enterprises (SMEs), regional development, export growth, human resource development and the use of new technologies in economic activities (PARP, 2019). From the entrepreneur's perspective, a beneficial initiative was the creation of **Special Economic Zones**. SEZs support the development of new investments, and each operates in a specific area of Poland, in accordance with the regulation of the Ministry of Entrepreneurship and Technology. Main tasks of these private limited companies include: supporting new investments under the "Polish Investment Zone" mechanism, carrying out promotion of economic activities

Table 5. Enrollment rates in higher education

Specification	2005/06	2010/11	2015/16	2016/17	2017/18	2018/19
	in %					
Gross enrollment rate	48.9	53.8	47.6	47.4	46.9	46.2
Net enrollment rate	38.0	40.8	37.3	36.8	36.2	35.6

Excluding foreigners. In the academic year 2005/06, excluding students of extramural studies

Source: Polish government statistics, 2019, p. 16

and new investments, taking measures to improve cooperation between entrepreneurs, local community and social partners, assuring that the needs of the labour market are considered in the education process, creating tools for the development of innovative economy, recommending to entrepreneurs the optimal location of new investments (Ministerstwo Rozwoju, 2019).

Business development strategies are documents in the area of medium – and long-term economic policy, which contain recommendations for public policies. An example of such a strategy is the Strategy for Responsible Development for the period up to 2020 (including the perspective up to 2030), adopted by the Council of Ministers. The strategy sets out basic conditions, objectives and directions of the country's development in the social, economic, regional and spatial dimensions for the period 2020 and 2030. The document responds both to the systemic transformation errors made so far and to the new challenges facing a broadly defined socio-economic policy of Poland, presenting responsible, socially and territorially sustainable development. The strategy also defines the system of coordination and implementation, setting out the roles of individual public entities, as well as ways of cooperating with the world of business, science and with the society (Strategy for Responsible Development, 2017).

The National Broadband Plan for 2025 is a strategy for the development of network and telecommunications infrastructure. It is a strategy paper setting out actions and measures to achieve the objective of ensuring universal broadband access to the Internet. The overarching objective of the National Broadband Plan is to stimulate demand for high-throughput access services (Ministerstwo Cyfryzacji, 2017). The National Broadband Plan is in line with the objectives of the Digital Agenda for Europe (DAE), the country's medium-term development strategy "Country Development Strategy 2020" and the country's long-term development strategy "Poland 2030. The third wave of modernity" is an executive document for the "Effective State Strategy". The expected effects of the plan's implementation is also an increase in the awareness and skills of users. The objectives of the broadband plan also concern future-looking solutions such as the Internet of Things, which could bring a number of new services such as smarthome, smart city and M2M connectivity (Machine to Machine), which is an increasingly common phenomenon in the world.

New trends in technology development have a huge impact on changes in innovativeness of enterprises. The accelerated pace of digitization is changing the face of business and contributes to an even greater increase in dynamics of the environment and market structure. The fourth industrial revolution, known as Industry 4.0. is the use of networks, the Internet and Big Data resources in cyber-physical systems (Dalenogare et al., 2018, p. 384).

Conclusions

A proper understanding of the nature of the entrepreneurial ecosystem (EE) is crucial in developing entrepreneurship. Changes in the ecosystem can affect

its condition, contributing to its evolution. The identified changes in the ecosystem have undoubtedly had a significant impact on the current shape of the ecosystem at the national level. In many cases, one change entails another, which is natural for ecosystems. The ability to determine domain dependencies can be crucial in trying to design an ecosystem.

The main elements that have influenced the ecosystem in Poland (regulatory change, EU accession) have created new opportunities for businesses and entrepreneurs. Certainly, the ecosystem's robustness has been put to the test. Other developments that are of accompanying nature and developed at a slower pace (areas of culture, human capital, support) provide results in today's evaluation of the level of entrepreneurship.

In the ecosystem there is a wide sphere of support (programs, incubators, competitions, associations, institutions, strategies), which aims to develop entrepreneurship. Participants act in the ecosystem with increased awareness, taking advantage of the opportunities offered by the entrepreneurship system. Increasing ecosystem awareness is linked to the increasing level of population's education, the quality of education and the cooperation of various entities belonging to the eco-system.

Poland's places in the REDI and GEI indices, both in terms of regions and the nation, indicate a good condition (health) of the ecosystem. Both indicators combine variables at individual level with institutional variables. By analysing the score of the pillars of entrepreneurship at regional and national level of the presented indices, we can see a positive change in the area of the Opportunity Start-up and Technology Absorption pillars, which may indicate an increase in the overall level of entrepreneurial abilities. Area in need of improvement is Competition, which is related to the level of uniqueness of the product and the market of new enterprises (start-ups). The second limiting area is enterprise innovativeness. The degree of Internationalization of companies and Start-up Skills are highly rated in the GEI report.

The domain of support is most developed in the entrepreneurial ecosystem, due to the European Union's support programs and strategy at national level. Poland's accession to the European Union has influenced the development of this sphere. However, mainly the more developed regions benefit from this support, and programs are needed for smaller cities and regions where access to education is limited. The concentration of innovative activity is present in an actively innovative group of enterprises. Companies wishing to implement R&D activities and innovation are less likely to receive institutional support. Despite the abundant active support programs, there is a noticeable lack of a coherent and comprehensive program, an intervention plan.

Enterprises are increasingly conscious in the ecosystem, which can have a positive impact on ecosystem co-evolution. The development of entrepreneurship also takes place through increasing the level of education and access to telecommunications infrastructure. Ecosystems create an environment that supports entrepreneurial activities,



but can also limit the implementation of these activities, therefore, the determination of the overall condition of the Polish ecosystem, identification of selected co-evolutionary aspects and conditions for further development provide directions for future empirical research.

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References

- [1] Altomonte C., Békés G. (2016), *Measuring Competitiveness in Europe: Resource Allocation, Granularity and Trade*, Bruegel Blueprint Series, Vol. XVII, Bruegel, Brussels.
- [2] Brzóska J., Cierkosz J. (2016), *Ocena innowacyjności przedsiębiorstw w Polsce*, „Przeгляд Organizacji”, Nr 10, s. 12–22.
- [3] Dalenogare L.S., Benitez G.B., Ayala N.F., Frank A.G. (2018), *The Expected Contribution of Industry 4.0 Technologies for Industrial Performance*, „International Journal of Production Economics”, Vol. 204(C), pp. 383–394.
- [4] Emerling I. (2015), *Rola audytu w zarządzaniu jednostką – aspekt praktyczny*, „Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach”, Nr 240, s. 90–100.
- [5] Feld B. (2012), *Start-up Communities: Building an Entrepreneurial Ecosystem in your City*, John Wiley & Sons, New Jersey.
- [6] GEI: The Global Entrepreneurship Index, The Global Entrepreneurship and Development Institute, 2019, <https://thegedi.org/global-entrepreneurship-and-development-index>, access date: 01.08.2020.
- [7] Isenberg D. (2011), *Introducing the Entrepreneurship Ecosystem: Four Defining Characteristics*, „Forbes”, May 25, <http://www.forbes.com/sites/danisenberg/2011/05/25/introducing-the-entrepreneurship-ecosystem-four-defining-characteristics>, access date: 01.08.2020.
- [8] Kłobuszewska M., Kobus M., Kopańska A., Rokicka M., Tomasik M., Siergiejuk M. (2012), *Analiza najważniejszych trendów w polskiej oświacie oraz szkolnictwie wyższym*, [w:] *Raport o stanie edukacji 2012. Liczą się efekty*, Instytut Badań Edukacyjnych, Warszawa.
- [9] Lisiecka K. (2012), *Audyty wewnętrzny i kontrola zarządcza w procesach doskonalenia zarządzania organizacją sektora publicznego*, Seminariusz posiedzenia Kolegium Najwyższej Izby Kontroli, 5 grudnia 2012 r.
- [10] Ministerstwo Cyfryzacji (2017), *Narodowy Plan Szerokopasmowy*, <https://www.gov.pl/web/cyfryzacja/narodowy-plan-szerokopasmowy>, data dostępu: 20.07.2020 r.
- [11] Ministerstwo Funduszy i Polityki Regionalnej (2019), *15 lat w Unii Europejskiej. Bilans członkostwa*, <https://www.gov.pl/web/inwestycje-rozwoj/15-lat-w-unii-europejskiej-bilans-czlonkostwa>, data dostępu: 20.07.2020 r.
- [12] Ministerstwo Rozwoju (2019), *Specjalne Strefy Ekonomiczne*, <https://www.gov.pl/web/rozwoj/specjalne-strefy-ekonomiczne>, data dostępu: 20.07.2020 r.
- [13] Nicotra M., Romano M., Del Giudice M., Schillaci C.E. (2018), *The Causal Relation between Entrepreneurial Ecosystem and Productive Entrepreneurship: A Measurement Framework*, „Journal of Technology Transfer”, Vol. 43, No. 3, pp. 640–673.
- [14] PARP: Polska Agencja Rozwoju Przedsiębiorczości (2019), *Wdrażanie innowacji przez MŚP*, <https://www.parp.gov.pl/component/grants/grants/wdrazanie-innowacji-przez-msp>, data dostępu: 15.08.2020 r.
- [15] Polish government statistics (2019), *Szkoły wyższe i ich finanse w 2018 roku*, <https://stat.gov.pl/obszary-tematyczne/edukacja/edukacja/szkoły-wyższe-i-ich-finanse-w-2018-roku,2,15.html>, data dostępu: 20.08.2020 r.
- [16] Raport Rynek B+R+I w Polsce (2015), *Wsparcie Działalności Badawczej, Rozwojowej i Innowacyjnej Przedsiębiorstw*, Crido Taxand, Polska Agencja Informacji i Inwestycji Zagranicznych, Techbrainers, Warszawa.
- [17] REDI: The Regional Entrepreneurship and Development Index – Measuring regional entrepreneurship Final report, European Commission 2014, <https://op.europa.eu/pl/publication-detail/-/publication/afc2a25c-d650-4be0-85cc-621ac9bab53c>, access date: 20.08.2020.
- [18] Roundy P.T., Bradshaw M., Brockman B.K. (2018), *The Emergence of Entrepreneurial Ecosystems: A Complex Adaptive Systems Approach*, „Journal of Business Research”, Vol. 86(C), pp. 1–10.
- [19] Spigel B. (2017), *The Relational Organization of Entrepreneurial Ecosystems*, „Entrepreneurship Theory and Practice”, Vol. 41, No. 1, pp. 49–72.
- [20] *Strategy for Responsible Development for the period up to 2020 (including the perspective up to 2030)*, adopted by the Council of Ministers on 14 February 2017, Ministry of Development, Department of Development Strategy, Warsaw.
- [21] Szerb L., Lafuente E., Horváth K., Páger B. (2019), *The Relevance of Quantity and Quality Entrepreneurship for Regional Performance: The Moderating Role of the Entrepreneurial Ecosystem*, „Journal of Regional Studies”, Vol. 53, No. 9, pp. 1308–1320.
- [22] Sztompka P. (2002), *Socjologia: Analiza społeczeństwa*, Znak, Kraków.
- [23] Transparency International (2018), *Corruption Perceptions Index 2018*, <https://www.transparency.org/cpi2018>, access date: 20.08.2020.
- [24] Transparency International (2018), *Poland*, <https://www.transparency.org/country/POL#>, access date: 20.08.2020.
- [25] Uslaner E. (2004), *Trust and Corruption*, [in:] J.G. Lambsdorff, M. Taube, M. Schramm (eds.), *The New Institutional Economics of Corruption*, Routledge, London.
- [26] Ustawa z dnia 23 grudnia 1988 r. o działalności gospodarczej z udziałem podmiotów zagranicznych, Dz.U. 1988, Nr 41, poz. 325, 324.
- [27] Ustawa z dnia 24 lutego 1989 r. o niektórych warunkach konsolidacji gospodarki narodowej oraz o zmianie niektórych ustaw, Dz.U. 1989, Nr 10, poz. 57.

- [28] Waściński T., Sławińska J. (2013), *Audyt wewnętrzny wspomagający zarządzanie sektorem publicznym – główne problemy i propozycje usprawnień*, „Zeszyty Naukowe Uniwersytetu Przyrodniczo-Humanistycznego w Siedlcach”, Seria: Administracja i Zarządzanie, Nr 97, s. 57–71.

Wybrane aspekty koewolucji polskiego ekosystemu przedsiębiorczości

Streszczenie

Warunki funkcjonowania organizacji zmieniają się, a współczesne organizacje działają w bardziej złożonym, sieciowym środowisku. Koncepcja ekosystemu przyjęta z organizacyjnego punktu widzenia uwzględnia jego składowe elementy oraz powiązania uczestników. Ekosystemy rozwijają się naturalnie poprzez koewolucję, jednak różnymi działaniami możemy na nie wpływać i próbować projektować w sposób inteligentny. Kluczowe jest właściwe zrozumienie natury ekosystemu przedsiębiorczości. Ekosystemy o dobrej kondycji charakteryzują się większą wytrzymałością i wpływają korzystnie na zarządzanie w obszarze rozwoju firm. Wytrzy-

mały ekosystem jest względnie bardziej przewidywalny, a relacje pomiędzy uczestnikami ekosystemu są mniej narażone na zakłócenia.

Celem publikacji jest określenie ogólnej kondycji polskiego ekosystemu przedsiębiorczości oraz próba identyfikacji wybranych aspektów koewolucyjnych. Przedstawiona ocena zachodzących zmian i ich wpływu na ekosystem przedsiębiorczości służy sformułowaniu wniosków oraz możliwości dalszego rozwoju ekosystemu. Rankingi Polski w indeksach REDI oraz GEI zarówno pod względem regionalnym i krajowym wskazują na dobrą kondycję ekosystemu, jednak niektóre jego obszary nadal wymagają wzmocnienia, co jest również podstawą do dalszych badań. Analizując różne spojrzenia na pojęcie ekosystemu, można zauważyć, że ekosystem składa się z czynników: technologicznych, kapitałowych, zarządczych, regulacyjnych, których połączenie decyduje o zdolności ekosystemu do rozwoju.

Słowa kluczowe

ekosystem, ekosystem przedsiębiorczości, przedsiębiorczość