Chapter 8
Transition of Innovation Ecosystem in Lithuania

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Introduction

The assumption of transition theory underlines that society changes in a rather evolutionary and organic way to a certain development. Although transitions are characterized by non-linear behaviour, the process itself is gradual, spanning one or two generations: predevelopment, take-off, breakthrough, and stabilisation (Voss et al., 2006). However, uncertainties during the last ten years in Lithuania and beyond enhanced the development of system thinking in terms of resilience, which has become central to the transition concepts.

The discussion presented in this chapter briefly assesses the transition of the innovation ecosystem in Lithuania during 2012-2022 by focusing on interconnection as the main driver for innovation. The chapter proposes that the transition in the innovation ecosystem was caused by developments in various domains, like public policy, finance, management, and others, which sustain each other. The discussion reflects a goal-oriented modulation of transition, but not an attempt to achieve predefined outcomes through control.

Keywords: transition, transition management, Lithuania, innovation ecosystem, business

Theoretical Aspects of Transition and Transition Management

The need to develop the Lithuanian economy in an innovation-based direction has been acknowledged at different levels, both at the national (Guidelines for Innovation Policy Changes, new Law on Innovation and Technology, etc.) and international (accession to the Organisation for Economic Co-operation and Development (hereafter-OECD), associated membership in The European Organization for Nuclear Research, etc.). The basic assumption of transition theory comprises that something or someone changes in an evolutionary way and a transition is a result of interconnected developments that sustain and enhance each other; however, such assumption continues to be controversial (Bonno et al., 2016).

Transition studies have experienced a scientific interest over the recent years, especially regarding historical changes in governance framework, for example, in

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https://doi.org/10.24818/978-606-34-0414-0_8

the case of education, health, or energy sectors. Every transition requires changes in the entire structure involving institutions, networks, individual behavior, new knowledge, etc., and political strategies and policy instruments are required to understand a transition (Mickwitz et al., 2021, Voss et al., 2006). Thus, a transition is often characterized by non-linear behavior, the process itself is gradual and every stage differs: predevelopment, take-off phase, breakthrough, and stabilization phase (Rotman et al., 2001; Voss et al., 2006) and in any sector a transition requires innovation, but as well innovation ecosystem goes through transition. The transition from an innovation perspective may disrupt the existing system, for example, smartphones or the internet of things. A transition may also be understood as a multilevel model entailing societal landscape, networks and institutions, and even micro behavior (Rotman et al., 2001, Zolfagharian et al., 2019), or when described as a result of interactions between developments is evaluated through indicators (Bonno et al., 2016)

Many past and ongoing studies on transition-related research to epistemological and disciplinary backgrounds, explore transition majorly from three different approaches (Loorbach, 2017). First, the socio-technical approach emerged around dominant technologies as the subject to transitions, for example, energy or mobility. Second, the socio-institutional approach aims to understand systemic changes in a complex society on how powers, interests, discourses, and regulations create path dependencies and how these are challenged by transformative social innovations. Third, the socio-ecological approach is built on insight from ecology, biology, ecosystem services, and adaptive governance, for example, climate resilience, metabolism, etc. (Loorbach, 2017)

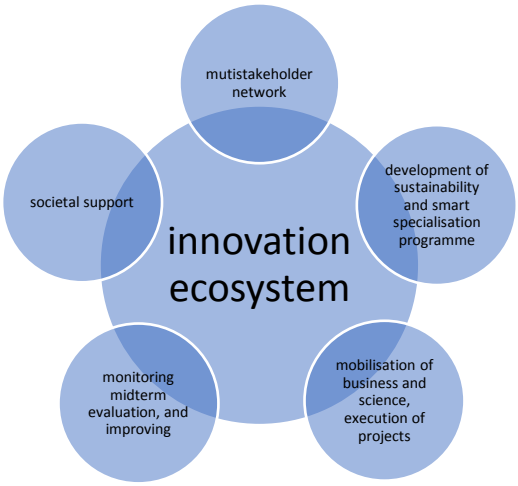
Within the growing policy discourse on sustainability, the term transition has continued to be applied to policy frameworks in practice, for example, recently in green economy or digitalization. In this chapter, the focus explicitly is on how the transition is linked to the innovation ecosystem which ”is seen as the evolving set of actors, activities, and artifacts, and the institutions and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors” (Granstrand, Holgersson, The total number of confirmed cases worldwide has been growing at a historically high rate, reaching over 6.3 million at the end of 2020). Transition, as well as the development of an innovation ecosystem, are both complex non-linear large-scale systems, multilevel and multi-face (Loorbach et al., 2017), but to capture the complexity of transition the socio-technical approach is required in learning the framework, for understanding transformative changes an analytical framework should rely on interdisciplinary approaches.

Thus, the innovation ecosystem as a collaborative network has been analysed for decades, the transition mechanisms have received little attention in research. The transition in innovation has evolved rapidly since 2011 and become a distinct area of research. It has also produced new approaches and evidence-based instruments, like European Commission’s Innovation Scoreboards, World’s Intellectual Property

Organisation's Global Innovation Index, and the Global Entrepreneurship Monitor. It has shaped the understanding of innovation challenges in different policy areas at the local and international levels, for example, digital education, social innovations, cyber security, etc. The challenge in the transition management field drew attention to new issues such as economic stagnation, for example, economic shocks, the aging population, lack of productive growth, rising unemployment, also destabilization like wars, terrorism, civil rebellions, and finally collapse, like global recession, economic crisis, etc. (Kallis et al., 2012; Turnheim et al., 2015). However, in the innovation area, there is a need for new perspectives and critical evaluation of the innovation ecosystem. And there remains still undefined evidence of how resilient is the theory of transition in case of disruptions (Mossel et al., 2018), like the COVID-19 pandemic or the Russia-Ukraine war. The transition research and learning should remain open to new perspectives and enlarge its contribution to strengthening the innovation ecosystem.

When aiming to understand transition political strategies and policy instruments are needed (Mickwitz et al, 2021), but insights about transitions can be combined into governance strategy for public authorities and private actors. Transition management aims to improve the existing systems, but it is also based on the process-oriented approach that encounters uncertainty and complexity, involving transition objectives, the transition process, and the enrichment aspect (Rotmans et al., 2001a, 2001b). The cyclical and iterative elements of transition management are portrayed in the innovation ecosystem in Lithuania during the last decade in Figure 8.1.

Figure 8 .1 Transition management framework in developing an innovation ecosystem



Source: created by the author and is based on decision-making processes in Lithuania

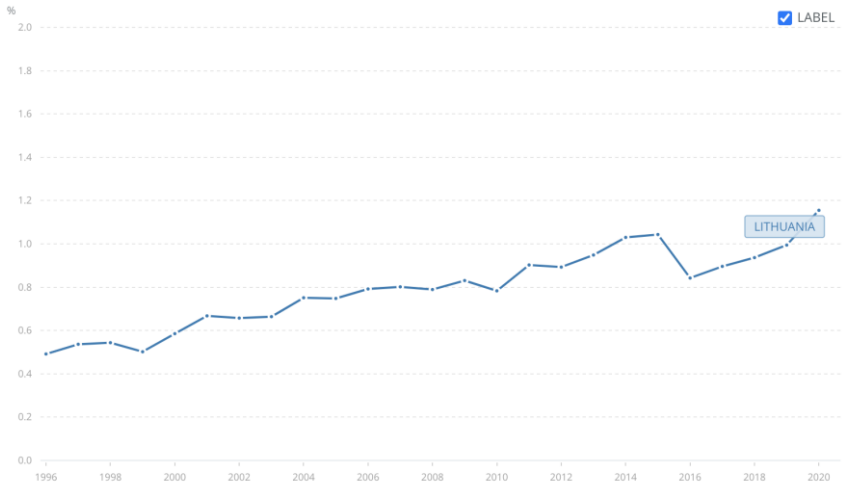
It is probably impossible to complete the multidimensional and multidisciplinary process of transition in any sector (Klitkou et al., 2015) and especially in the innovation ecosystem regarding its direct and indirect linkage to other sectors, however, the variety of evaluation perspectives is a huge strength of the sustainability of transition management.

Development of Innovation Ecosystem in Lithuania

The Lithuanian innovation ecosystem is rather young, as the current Ministry of Economics and Innovation has only been fully in charge of the country's innovation policy since 2009 in cooperation with the Ministry of Education, Research and Sport, supporting research and development (hereafter R&D) activities in innovation area since 1992.

According to the last review of the Lithuanian innovation ecosystem by the Lithuanian Government Strategic Office, the share of innovative companies in Lithuania in the period of 2012-2018 increased by almost 3.5 times, and the number of people employed in R&D in the business sector grew by almost 10% from 2015 to 2018 (STRATA, 2019). However, the share of knowledge in innovation activities remains low and most of the expenditure is spent on infrastructure. In Lithuania R&D expenditure (% of GDP) in Lithuania was reported at 1.1553% in 2020, see Figure 8.2, but has continued growing since 2016, after a drop from 2015, however, still being below the EU average (World Bank, 2022).

Figure 8.2 Research and development expenditure (% of GDP) – Lithuania



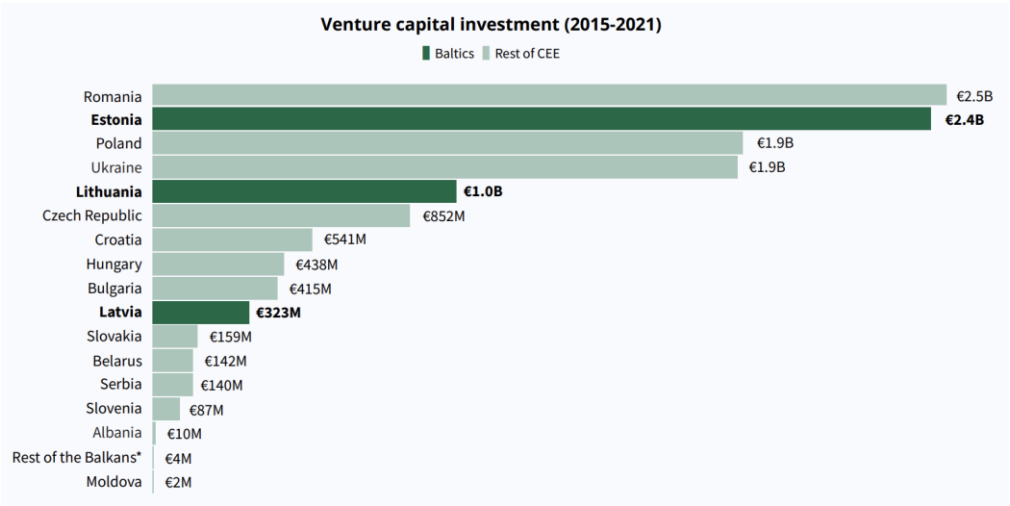
Source: World Bank, 2022

The role of higher education institutions in the innovation ecosystem in Lithuania is crucial. A recent study carried out by the OECD shows that Lithuania is among the states with the highest number of 30-34-year aged persons with higher education, or 57% (OECD, 2022). The higher education sector helps to create added value to the

innovation ecosystem, especially for the business sector, where innovating companies reflect the outcomes of the innovation ecosystem. In 2016-2018 the share of innovative companies among all companies in Lithuania was 45,3% (Review, 2019), however, most of these companies remain process innovators.

It is important to understand the defining features of the evolution of the innovation ecosystem in every country. Firstly, it is the availability of research and commercial resources, secondly, business companies in the system, and finally, the development of robust businesses (Cooper et al., 2012). A recent study by Feng (Feng et al., 2021) shows how start-ups or local companies increase performance results of the innovation ecosystem, and the transition process of the growth of start-ups impacts both individual and organizational level matters, as well the capabilities of the market itself. In 2021 Lithuanian startups attracted more than EUR 420 million in investments, and the total value of Lithuania's innovative businesses reached EUR 7.1 billion, (Startup Lithuania, 2021), see Figure 8.3.

Figure 8.3 Venture capital investments 2015-2021



Source: Dealroom.co *North Macedonia, Kosovo, Montenegro, Bosnia, and Herzegovina, 2022

The review of the innovation ecosystem shows that Lithuania is in 19th place in the European Commission (hereafter EC) Innovation Scoreboard 2022 (EC, 2022) and has reached its highest level in terms of innovation ecosystem development since 2015. When analyzing the transition of innovation ecosystem indicators between 2015 and 2022, Lithuania has seen rapid improvements in risk capital expenditure, product innovation, process innovation, and business R&D expenditure.

Moreover, the indicator for employment in innovative companies has continued to increase as well, the positive changes are defined for business spending in

innovations and collaboration of companies. The above has led the country to higher performance in the innovation area.

Following are two cases from Lithuanian enterprises shortly illustrating the evolution of companies in the innovation ecosystem.

Example 1. With sales in over 50 markets worldwide and 12 international awards, Deeper is one of Lithuania's most successful and innovative tech companies. The company's flagship product, the Deeper Sonar, was launched in 2013, creating an entirely new product category in the angling sector. It put detailed sonar data into the hands of shore anglers for the first time ever, by pairing the castable sonar device with the angler's smartphone. Since then, Deeper has added two new higher-spec models and three accessories to its product portfolio. Designed, developed, and manufactured in Lithuania, these products are now sold in over 50 markets globally and have picked up 12 international awards. Most notably, in 2016 Deeper Sonar won an Innovation Award at the Consumer Electronics Show, with other winners that year including Samsung, Lenovo and HP. (Invest Lithuania).

Deeper from the beginning has become a part of Open R&D Lithuania network that is a platform of cooperation between open access R&D centers/laboratories of 12 Lithuanian universities, 13 public research institutes and seven science and technology parks. Deeper as well as other Lithuanian innovation companies (around 700 companies registered in Open R&D Lithuania) through this platform united their intellectual potential, infrastructure and resources in order to provide scientifically based solutions to the problems raised by market and society in general.

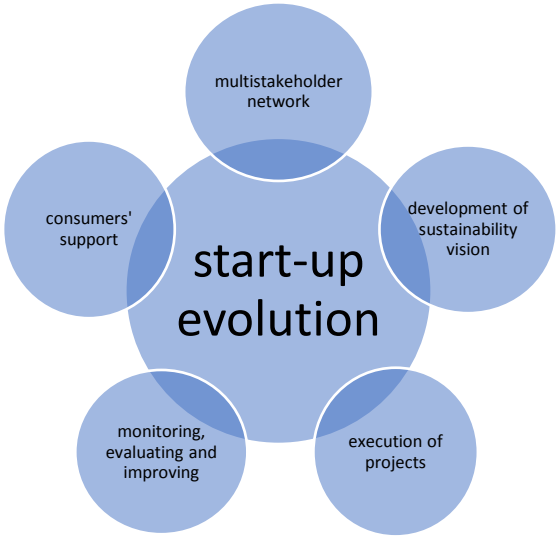
Example 2. Thermo Fisher Scientific is the world's leader in the life science sector, with revenues of more than $20 billion and approximately 65,000 employees globally. The company accelerates life sciences research improves patient diagnostics and increases laboratory productivity. Thermo Fisher Scientific came to Lithuania in 2010, when the company acquired a leading Lithuanian biotech company Fermentas for 260 million USD.

At present Thermo Fisher Scientific Vilnius has world-class capabilities in manufacturing products for the life science market, specifically in molecular, protein, and cellular biology, and has an outstanding R&D center, focused on the development of new products in all aspects of molecular, protein, and cellular biology.

Thermo Fisher's products are broadly used worldwide to study gene structure, expression, and variety, and to create new diagnostics methods for innate, hereditary, and infectious diseases. Currently, the Vilnius site employs almost 1,900 and is one of the largest private R&D centers in the whole region.

The above literature review and analysis of Lithuania's cases have helped to construct a framework for the transition of an innovation ecosystem with regard to start-up evolution, see Figure 8.4.

Figure 8.4 Transition management framework of a start-up company in innovation ecosystem



Source: created by author

The above analysis shows that in the case of innovation ecosystem transition management deeper analysis of non-technical barriers, like demographics, employment, education, etc. is important for decision-making, but apart from such analysis, there should be political prioritisation of new options like innovation-oriented missions, a new instrument recently introduced by the European Commission. Additionally, there is an important question for transition management about how to keep open the pathways for new research and business cooperation ideas and how to employ governmental support more effectively for higher performance results in the innovation ecosystem. The presented frameworks show that development rounds in transition management allow innovation ecosystem instruments, like smart specialisation strategies, and mission-oriented innovation programmes to be monitored and evaluated. In every transition management framework establishing societal support or customer support is crucial. Thus in a competitive global or small local market, like Lithuania, gaining such support might be challenging, because companies, as well as research institutions, are focused on short-term developments, aiming at a return on investments, especially in relation to renewed and newly built infrastructure, it is recommended to further analyse the impact of such support to new innovation-oriented challenges like a green economy, digitalisation, or other local and global initiatives.

Summing up the discussion from this chapter it could be concluded that the transition in the innovation ecosystem is caused by developments in various domains which supplement each other. It reflects a goal-oriented modulation of transition, but not

an attempt to achieve predefined outcomes through control. While no single company can transform the whole innovation ecosystem, it is expected in Lithuania that the Government together with frontier research institutions takes the lead. The government in Lithuania has taken action in the innovation ecosystem for decades but its measures have mostly comprised - funding, performance monitoring, or initiating an innovative procurement. Finally, it should be defined that effective transition management could help to better coordinate policy-making processes and to mobilize efforts for societal support.

Questions/Tasks/Debate topics for classroom discussion

Tasks for students:

Task 1. Evaluate short-term actions in the innovation ecosystem from the point of transition:

- How do the actions taken provide insight into the coherence between a transition's sociocultural, economic, and institutional dimensions?
- How the possibilities of transition paths can be explored through the actions taken?
- What actions taken do contain the learning potential?
- Do the other actors and/or other sectors adopt the transition objective as their action perspective?

Task 2. Choose a company operating in your country or abroad and analyze the transition of a company regarding the innovation ecosystem. Additionally, please include in your final report:

- Analysis of external actions relevant to the company's operations.
- Analysis of innovative actions based on the Frascati Manual (or you can choose another methodology): product innovation (new product, improved product), process innovation (new production methods, new production organization methods), innovative activity (generation and acquisition of new knowledge, other production process development and improvement works, marketing of new or improved products)
- Evaluation of the company's innovation potential (technological development, human resources, change in company income, other indicators)

Topic 1. Skills for Effective Innovation Ecosystem.

The pandemic witnessed in the past years has served as an incredible driver for innovations. A variety of stakeholders can align under a clear common goal, for example, COVID-19 pandemic reveals that governments and private companies are able to effectively work together. During the discussion students try to share their insights on what makes innovation ecosystems effective, and how are effective innovation ecosystems created.

Topic 2. Cities Create New Pathways for Innovation Ecosystem

During the discussion, students catalyse the debate about how a city can be an actor in the innovation value chain creating a favourable environment for innovation. Students also look for answers about city approaches for the acceleration of start-ups and their transformation towards innovative small and medium enterprises.

Further reading

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