

ANALYSIS OF START-UP DEVELOPMENT REGISTERED IN THE ASSOCIATIONS IN THE BALTIC STATES

*Aija Vonoga¹, Baiba Kļaviņa²

¹Rezekne Academy of Technologies, Latvia

²Vidzeme University of Applied Sciences, Latvia

*Corresponding author's email: aija.vonoga@rta.lv

Abstract

This research paper focuses on start-ups. The topicality of the research is based on economic development requirements and trends. Development of start-ups is an important chain link in the innovation system and promotes the change of the paradigm to modern and innovative economy. The aim of the research is to study start-up associations in Latvia, Lithuania and Estonia and analyze start-ups registered in databases of these associations. Tasks of the research are the following: to carry out a theoretical analysis of Latvian, Lithuanian and Estonian start-up associations and start-ups; to study the variables that characterize start-ups registered in start-up associations in Latvia, Lithuania and Estonia; to perform data analysis and visualize results; to present conclusions and proposals for further research. Research covers data about start-ups founded in the period from 2011 until 2021 and included in Baltic start-up association databases. General scientific research methods used in the research are the monographic or descriptive research, the comparative analysis and the descriptive statistics. Research authors conclude that Latvian association of start-ups is different from counterparts in Lithuania and Estonia. It might be assumed that it affects the divergence of the number of start-ups registered in databases. In Latvia, this number is almost 10 times lower than in other Baltic states.

Key words: Start-up, Estonia, Latvia, Lithuania, association, ecosystem.

Introduction

There are various definitions of the concept of start-up in the literature, but Steve Blank and Bob Dorf define a start-up as follows: 'A start-up is not a smaller version of a large company. A start-up is a temporary organization looking for a scalable, repeatable and profitable business model' (Blank & Dorf, 2020). Analyzing this definition, it can be concluded that the goal of start-up is to create a successful business model to grow and develop in the market. The study of start-ups is conducted in the context of the Baltic market although their markets are small compared to other countries.

Compared to other countries, Estonia, Latvia and Lithuania have small markets and limited economic power, which shows that they are not attractive to international suppliers and are not able to offer as high offers as other countries (Webb *et al.*, 2021). Researching the literature in scientific databases on the topic, such as Scencedirect, Ebsco, Scopus, MDPI, etc., studies of start-up companies in the Baltic States are not available, accordingly this confirms the usefulness for research of start-ups in the Baltic context.

Start-ups are drivers of change that bring innovation and find new solutions to old problems (Devadiga, 2017). They are inventing new business models that surprise existing markets. Their business is based mainly on new technologies and knowledge (Cockayne, 2019). Several studies indicate that start-ups have a positive impact on the economy and contribute to its development (Reisdorfer-Leite *et al.*, 2020). Successful start-ups create new jobs and contribute to economic prosperity (Tripathi *et al.*, 2019). The positive impact of the start-up on the economy is also observed in the Baltic States.

So far in 2021, Lithuania has seen 277 million EUR in investment (compared to just 17.9 million EUR in 2020 and 151 million EUR in 2019). In 2020, Estonian start-ups received 115 million EUR in capital (Sifted, 2022). Latvian startups have raised more than 247 million euros in 2021 (Magnetic Latvia, 2022). The Baltics have birthed Bolt, the Estonian ride-hailing app, and Vinted, Lithuania's increasingly popular secondhand clothes marketplace. Other, but exited unicorns include Skype and Wise (previously TransferWise). But with only two unicorns, the region has a lot of room for growth – and needs it if it's going to compete with more established markets. Fintechs like consumer lender Sun Finance, which recently placed 2nd in the FT1000 with a compound growth rate of 752%, are particularly promising. And thanks to start-up-friendly regulations, Lithuania is Europe's second-largest regulated fintech hub. While many Baltic start-ups have also moved out of the small and underpopulated regions to capitalise on more established markets, as usual, this list only includes start-ups headquartered in Estonia, Latvia and Lithuania (Sifted, 2022).

Start-up is a new activity that involves the development and validation of a business model (Trinh, 2019). Start-up performance can be affected by material capital, human capital, knowledge and entrepreneurial capital (Audretsch & Keilbach, 2010). Understanding the factors that affect a company's survival is a key issue for the proper management of business projects and start-up programs, given the high risk of business mortality in its first five years (Segura, 2019). Factors influencing start-ups at their initial stage continue to affect the company throughout its existence.

Start-up performance can also be affected by access to multiple networks, resources, and knowledge (Battistella, De Toni, & Pessot, 2018). In addition, open innovation practices promote networking, collaborative work and knowledge flow, partnerships and external links with other networks and companies (Pustovrh, Rangus, & Drnovšek, 2020). Networking between start-ups facilitates day-to-day work and knowledge transfer, so in the context of the Baltic States, it would be advisable to set up one Baltic start-up platform in order to promote joint cooperation and growth.

The aim of the research is to study and analyze start-up associations in Latvia, Lithuania and Estonia and analyze start-ups registered in databases of these associations. Tasks of the research are the following: to carry out a theoretical analysis of Latvian, Lithuanian and Estonian start-up associations and start-ups; to study the variables that characterize start-ups registered in start-up associations in Latvia, Lithuania and Estonia; to perform data analysis and visualize results; to present conclusions and proposals for further research.

Materials and Methods

Start-up ecosystems in Baltic states

Association – an official group of people who have joined together for a particular purpose (Oxford learners dictionaries, 2022). In the Baltic states Latvian start-up association, Start-up Lithuania and Start-up Estonia are working in order to develop start-up ecosystems.

Development of start-ups is an important chain link in the innovation system and promotes the change of the paradigm to modern and innovative economy. Over the last years the Ministry of Economics of Republic of Latvia and the bodies subordinated to it have been actively working on the creation of uniform supply for the start-up ecosystem. The Latvian start-up ecosystem has become more visible also in the international context. Every year several local events and festivals with international coverage bring together start-ups and their representatives (Ministry of Economics Republic of Latvia, 2020).

Latvian start-up association (NGO) Startin.LV was created in 2016 to unite Latvian start-up community around common values and provide joint opinion with the aim to develop a better start-up ecosystem in Latvia. Startin.LV is a platform that enables start-ups to initiate ideas, be heard and receive support in fulfilling their needs and solving problems. Objectives of Latvian start-up association are: to represent start-up interests; to gather up to date insights and represent start-ups joint interests; to unite 80+ start-up ecosystem members in Latvia; to create a united force for entrepreneurial growth in collaboration with

ecosystem representatives, governmental institutions, universities, etc.; to support its members; to provide information, consultations and help in finding partners, investors and employees; to support start-ups interest and share up-to-date information about the start-up ecosystem (Startin.lv, 2022). Looking at the companies in the Latvian start-up database, it can be concluded that the largest companies (external funding exceeds EUR 4 million) are Printful, Lokalise, Printify, Lightspace Technologies, Sonarworks, Beetroot Lab, Juro, Giraffe360, Aeronex, Nexpay and others. The largest start-up companies not only develop the Latvian economy, but also create Latvia's recognition in the world.

Start-up Lithuania is the national start-up ecosystem facilitator between fast-growing business, venture capital funds, accelerators, start-up friendly enterprises, and the government. It supports start-up ecosystem by publishing start-up news, providing start-ups database and job marketplace, sending a weekly newsletter that covers the ecosystem, organizing start-up events (Seminars, BarCamp, Workshops, and Start-up Fair – main start-up event of the year), consulting, advising, introducing, networking (as they do know everyone in the ecosystem) and by educating the ecosystem and futurepreneurs. Start-up Lithuania is powered by Enterprise Lithuania, the governmental institution, which aims to support business establishment, entrepreneurship, and fosters export (Start-up Lithuania, 2022). Some of the largest registered companies in the Lithuanian start-up database are Vinted, Nium, Genius sports, City bee, Simplex and Transfergo.

Start-up Estonia is a governmental initiative aimed to supercharge the Estonian start-up ecosystem for it to be the birthplace of many more start-up success stories in the future. For that, Start-up Estonia is working on making Estonia one of the world's best places for start-ups by focusing on these building blocks: Strong ecosystem - uniting, building and representing the local start-up community. Supporting regional development and science-based decision making; Smart people - promoting diversity and co-organizing impactful start-up events with the community Smart money – educating and attracting investors, helping resources and know-how reach start-ups (Start-up Estonia, 2022). In 2018, there were 330 million euros invested into Estonian start-ups (Grant Thornton, 2019). The largest companies registered in the Estonian start-up database (by turnover and taxes) are Bolt, Veriff, Swappie, Adcash, 3commas, Starship Technologies, Viseven and other companies that make a significant contribution to the overall Estonian economy.

Methodology of the research

Data used in research is taken from publicly available databases of start-up associations in

Latvia, Lithuania and Estonia. Data variables used in analyses - launch year (year founded), sector, market, type, business model, funding (investment), turnover 2021 Q4. Probabilistic data sampling was performed according to the stratified or typological random sampling method. Companies were selected first by year (from 2011-2021), and then individual units were selected by proportional sampling within the selected groups. There were 100 samples selected; however in the process of data cleaning, some samples were eliminated, so in the final data set for analysis, there are 96 samples of Lithuanian start-ups, 93 samples of Latvian start-ups and 97 samples of Estonian start-ups.

Results and Discussion

After the research of start-up associations databases, authors can conclude the common and different features in Latvia, Lithuania and Estonia. The Lithuanian start-up association has been operating for the longest time – since 2012. The

Estonian Start-up Association has been operating since 2015 and the Latvian one since 2016. Looking at the form of activity – in Lithuania and Estonia start-up associations are state-owned companies, but in Latvia it is a non-governmental organization, hence the funding models are different – in Lithuania and Estonia the associations are funded by the state, but in Latvia by the member fees. Common factors are visibility and some special offers for members of databases in all three Baltic countries.

Number of start-ups

Data from publicly available start-up associations databases of the Baltic States were used for analysis Latvian start-up association Startin.lv, Start-up Lithuania and Start-up Estonia. To analyze the trend of the number of start-ups of Baltics, the number of start-ups and the year of establishment were used. At the moment of desk research, there were 1527 start-ups registered in the Lithuanian database, 1301 companies in the Estonian database and 166 enterprises in the Latvian association’s database.

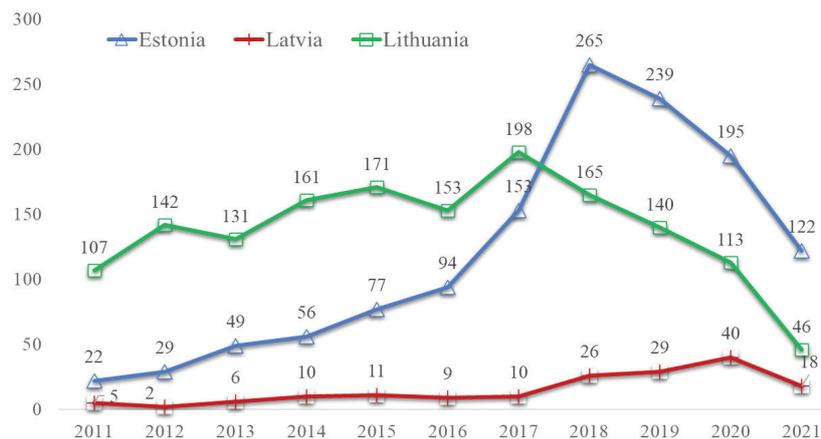


Figure 1. Number of start-ups in Baltic associations*, divided in groups by foundation year.

* Estonia – Start-up Estonia, Latvia – Latvian Start-up Association Startin.lv, Lithuania – Start-up Lithuania

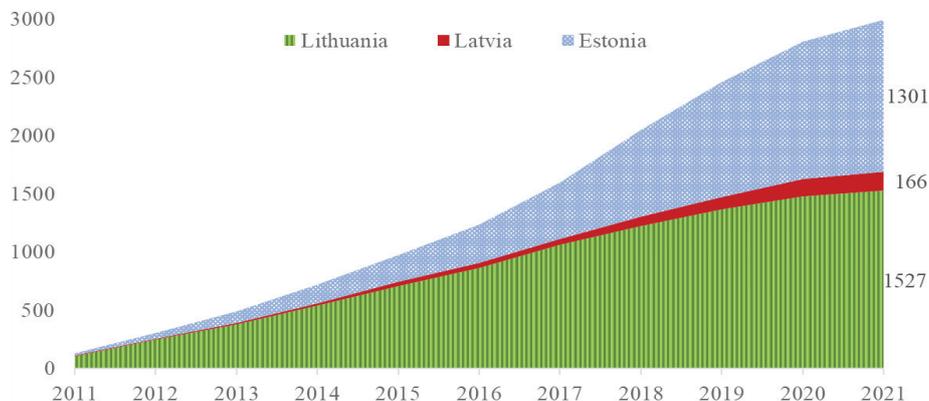


Figure 2. Number of start-ups in Baltic associations* (accumulative numbers).

* Estonia – Start-up Estonia, Latvia – Latvian Start-up Association Startin.lv, Lithuania – Start-up Lithuania

Table 1

Descriptive statistics

	LT_Funding	LV_Funding	EE_Turnover
Mean	3572031,25	3275693,849	7804442,268
Standard Error	1102195,99	1344363,076	3879061,733
Median	720000	300000	460000
Mode	1100000	50000	1100000
Standard Deviation	10799271,09	12964568	38204327,41
Sample Variance	1,16624E+14	1,6808E+14	1,45957E+15
Kurtosis	62,6615507	47,32072967	38,26443179
Skewness	7,380981907	6,526014577	6,16870192
Range	97890000	106896000	265991900
Minimum	10000	4000	8100
Maximum	97900000	106900000	266000000
Sum	342915000	304639528	757030900
Count	96	93	97
Confidence Level(95,0%)	2188135,696	2670021,11	7699876,683

In Figure 1, it can be seen that the number of start-up companies registered in all three Baltic States has increased between 2011 and 2017. Starting with 2018 in Lithuania and with 2019 in Estonia it can be observed a significant decline in the number of registered start-ups in national associations. However, the number of start-ups registered in the Latvian association continued to grow until 2020. The continued decline in 2020 and 2021 could be related to the spread of the Covid-19 pandemic in Europe and Latvia starting with 2020 and epidemiological constraints that slowed down the economy and prevented the emergence of new companies.

Figure 2 shows the number of start-ups in Baltic associations, divided in groups by foundation year from 2011 until 2021. The cumulative numbers in Figure 2 reflect the positive start-up growth. The number of companies in each country increased every year, but it can be clearly seen that the number of Lithuanian and Estonian start-up companies has a significant ascendancy over the total number of start-up companies registered in the Latvian association. It could be useful to study further the contributing factors that hinder the growth of the number of start-ups in the association in Latvia.

Financial indicators

Data regarding received funding was used from the Latvian and the Lithuanian associations. Due to lack of available data of investments in start-ups registered in the Estonian association, data on turnover for the year 2021 Q4 was used as a financial indicator. Although it cannot be argued that funding can be compared to turnover, to a certain extent these figures in the sample considered followed a similar trend.

Kurtosis and skewness are above 0 for all three variable groups, so it means that data curves are stretched

and the data grouping in the center of the curve is enhanced, and the curve is shifted to the left. That can be observed in Figures 3.1., 4.1. and 5.1. Median indicates that the number of received funding in Lithuania (which is situated in the middle of the data set) is 720 thousand EUR; however, according to mode the most common sum of funding received in observed Lithuanian start-ups is 1,1million EUR. In the sampling of Latvian start-ups mentioned indicators are lower – median is 300 thousand EUR and mode is only 50 thousand EUR. That shows that there are relatively more small start-ups in Latvian association than in Lithuania. Start-ups with the smallest funding included in this research sampling of Latvian data is 4 thousand EUR while for Lithuania it is 10 thousand EUR. Then again the maximum received funding in Latvian start-up is 106,9 million EUR, which is a bit more than in Lithuanian sample data (97,9 million EUR). Meanwhile, indicators regarding turnover in 2021 in Estonian start-ups – median of 460 thousand EUR and mode of 1,1million EUR – are more similar to median and mode regarding funding of Lithuanian start-ups.

As can be concluded from figures 3.1. and 4.1., most Latvian and Lithuanian start-ups have received less than 20 million EUR for funding. When analyzed closer, ~80% in Lithuania and 90% in Latvia have received less than 5 million EUR in funding (Figures 3.2. and 4.2.). Almost half of start-ups in both countries have received from 100 thousand EUR to 1 million EUR of funding. But in Latvia, there are a bit more start-ups with funding less than 100 thousand EUR than in Lithuania, and vice versa, Lithuania has a bit more start-ups with funding from 1 to 10 millions than in Latvia.

It cannot be possible to compare funding of start-up with turnover of start-up; however, data regarding

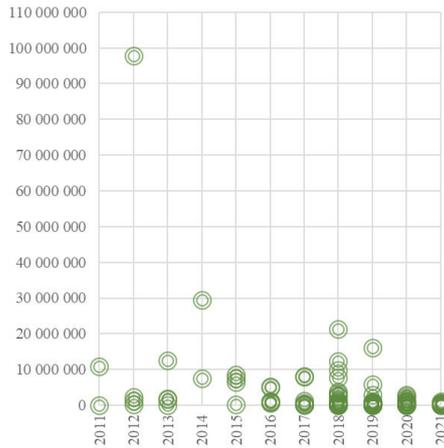


Figure 3.1. Sample of start-ups in the Lithuanian association database by received funding and their launch year.

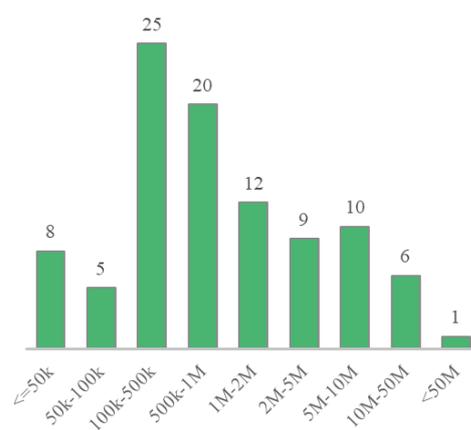


Figure 3.2. Sample of start-ups in the Lithuanian association database in clusters by received funding.

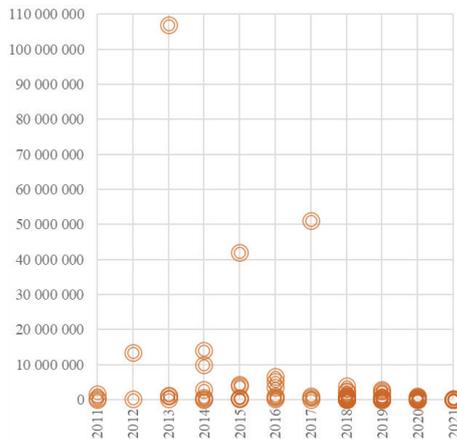


Figure 4.1. Sample of start-ups in the Latvian association database by received funding and their launch year.

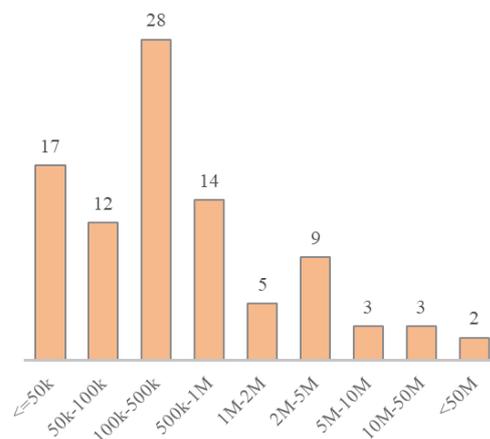


Figure 4.2. Sample of start-ups in the Latvian association database in clusters by received funding.

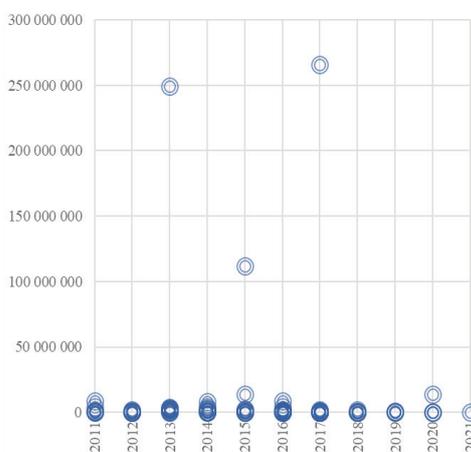


Figure 5.1. Sample of start-ups in the Estonian association database by turnover in 2021 and their launch year.

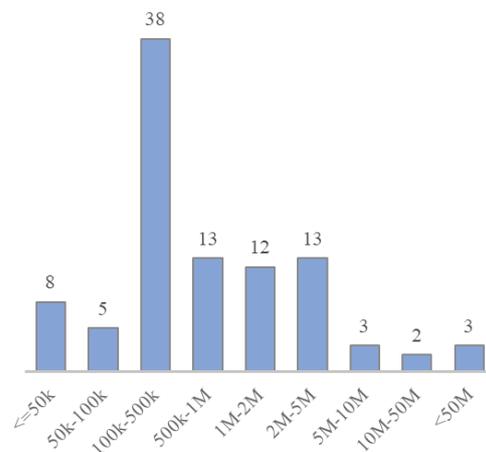


Figure 5.2. Sample of start-ups in the Estonian association database in clusters by turnover in 2021.

Estonian start-up turnover in 2021 Q4 shows similar trends as funding in Latvia and Lithuania. Not counting a couple of exceptions, most of the start-ups of the Estonian association in 2021 had turnover under 5 million EUR (Figures 5.1. and 5.2.). The biggest cluster (39%) consists of start-ups with turnover of 100 to 500 thousand EUR, followed by start-ups with turnover of 500 thousand to 5 million EUR in 2021 (what takes together another 39% of all analyzed start-ups).

Conclusions

Analyzing the available literature and the start-up databases, the authors conclude that start-ups are an important factor in economic growth; therefore, the development of start-up ecosystems will be rapidly growing in the future, as in recent years there has been a positive growth tendency in all Baltic countries.

It can be concluded that Latvian association of start-ups is different from its counterparts in Lithuania and Estonia. It might be assumed that it affects the divergence of the number of start-ups registered in databases. In Latvia, this number is almost 10 times lower than in other Baltic states.

Differences in the data included in the database and the methodology of their display hinder the possibility to fully compare the start-ups included in all three associations' databases.

The Lithuanian start-up association has been operating for the longest time – since 2012. The

Estonian Start-up Association has been operating since 2015 and the Latvian one since 2016. Looking at the form of activity – in Lithuania and Estonia start-up associations are state-owned companies, but in Latvia it is a non-governmental organization, hence the funding model is different – in Lithuania and Estonia the associations are funded by the state, but in Latvia by the member fee. Common factors are visibility and some special offers for members of databases in all three Baltic countries.

It is difficult to evaluate and compare start-ups due to the different methodologies of the companies represented in the Baltic associations, because the variants (sectors, market, type) indicated in each country are different, only a small part overlaps. Also, some companies have indicated a number of sectors of activity, but some have not indicated them at all. Similar conclusions can be drawn regarding start-ups division by business models. Some companies have indicated more than one business model used; however, some companies have not indicated any model used.

The authors suggest that it is necessary to review the form and sources of funding for the Latvian start-up association at the national level, as this is an obstacle to the development of the Latvian start-up ecosystem compared to the rest of the Baltic States. In further research, it is planned to investigate the factors that influence start-ups and how to increase and promote start-ups in Baltic states.

References

- Audretsch, D., & Keilbach, M. (2004). Entrepreneurship capital and economic performance. *Reg. Stud.*, 38, 949–959. DOI: 10.1080/0034340042000280956.
- Battistella, C., De Toni, A.F., & Pessot, E. (2018). Framing open innovation in start-ups' incubators: A complexity theory perspective. *J. Open Innov. Technol. Mark. Complex.*, 4, 33. DOI: 10.3390/joitmc4030033.
- Blank, S., & Dorf, B. (2020). *The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company*. Retrieved January 29, 2022, from https://books.google.lv/books?hl=en&lr=&id=3p_ODwAAQBAJ&oi=fnd&pg=PR29&ots=ePqExs9WLR&sig=EdMFkPDjfPNry-qjalaLA7Nqrzo&redir_esc=y#v=onepage&q&f=false.
- Cockayne, D. (2019). What is a start-up firm? A methodological and epistemological investigation into research objects in economic geography. *Geoforum* 2019, 107, 77–87. DOI: 10.1016/j.geoforum.2019.10.009.
- Dackevičiene, A., Vörk, A., & Karanikolos, M. (2021). Lessons learned from the Baltic countries' response to the first wave of COVID-19. *Health Policy*. DOI: 10.1016/j.healthpol.2021.12.003.
- Devadiga, N.M. (2017). Software engineering education: Converging with the startup industry. In *Proceedings of the 2017 IEEE 30th Conference on Software Engineering Education and Training (CSEET)*, Savannah, GA, USA, 7–9. DOI: 10.1109/CSEET.2017.38.
- Grant Thornton (2019). Influence of start-ups on the Estonian economy just keeps increasing. Retrieved January 3, 2022, from <https://www.grantthornton.ee/en/insights1/2019-influence-of-start-ups-on-the-estonian-economy-just-keeps-increasing/>.
- Magnetic Latvia (2022). 10 Biggest Latvian Startup Investments in 2021. Retrieved January 2, 2022, from <https://labsflatvia.com/en/news/10-biggest-latvian-startup-investments-in-2021>.
- Oxford University press (2022). Definition of association noun from the Oxford Advanced American Dictionary. Retrieved January 24, 2022, from https://www.oxfordlearnersdictionaries.com/definition/american_english/association.

- Pustovrh, A., Rangus, K., & Drnovšek, M. (2020). The role of open innovation in developing an entrepreneurial support ecosystem. *Technol. Forecast. Soc. Chang.*, 152, 119892. DOI: 10.1016/j.techfore.2019.119892.
- Reisdorfer-Leite, B., de Oliveira, M.M., Rudek, M., Szejka, A.L., & Junior, O.C. (2020). Start-up Definition Proposal Using Product Lifecycle Management. In *Proceedings of the IFIP International Conference on Product Lifecycle Management*, Rapperswil, Switzerland, 5-8 July 2020, pp. 426–436.
- Segura, F.M. (2019). El perfil emprendedor y la intensidad competitiva del mercado como predictores de supervivencia en microempresas mexicanas. *Contad. Adm.* 65, 1–27.
- Sifted (2022). The Baltic startups and scaleups to watch in 2021. Retrieved February 11, 2022, from <https://sifted.eu/rankings/baltic-startups-top-rankings>.
- Startin.LV (2022). Latvian startup association (NGO)What is Startin.LV? Retrieved February 14, 2022, from <https://startin.lv/learn-more/>.
- Startup Estonia (2022). What does Startup Estonia do? Retrieved February 14, 2022, from <https://startupestonia.ee/>.
- Startup Lithuania (2022). One stop shop for current and future startups in Lithuania. Retrieved February 14, 2022, from <https://www.startuplithuania.com/>.
- Trinh, T. (2019). Factors Affecting Startup Performance of Small and Medium-sized Enterprises in Danang City. *Entrepreneurial Business and Economics Review*, 7(3), 187–203. DOI: 10.15678/EBER.2019.070310.
- Tripathi, N., Seppänen, P., Boominathan, G., Oivo, M., & Liukkunen, K. (2019). Insight into startup ecosystems through exploration of multi-vocal literature. *Inf. Softw. Technol.* 104, 56–77.
- Webb, E., Winkelmann, J., Scarpetti, G., Behmane, D., Habicht, T., Kahur, K., Kasekamp, K., Köhler, K., Miščikiene, L., Misins, J., Reinap, M., Slapšinskaite-Dackevičienė, A., Vörk, A., & Karanikolos, M. (2021). Lessons learned from the Baltic countries' response to the first wave of COVID-19. *Health Policy*. 2021 Dec 13, S0168-8510(21)00293-1. DOI: 10.1016/j.healthpol.2021.12.003.