



Fostering collaboration through mapping, analysing and interlinking of European Entrepreneurial Regions – Phase II

Regional ecosystem in-depth mapping for the Region of
Pomorskie



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Pomorskie

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EXECUTIVE SUMMARY

The region of Pomorskie and the city of Gdańsk won the European Entrepreneurial Region Award for their joint application in June 2019. Pomorskie is one of three Polish regions with a coastline, situated by the Baltic Sea. The capital of the region is Gdańsk, a city of 470 907 inhabitants. The regional economy is medium in terms of size and is characterised by a stable position in relation to other Polish regions. Almost half of the regional GDP is generated in a metropolitan area of Gdańsk-Gdynia-Sopot, known also as the 'Tri-City', where the highest level of GDP per capita is also recorded. The cities of Copenhagen and Gothenburg are often cited as model cities for future development of the Tri-City.

The region is ranked in 3rd position in the country on the composite indicator of entrepreneurship used by the Polish Agency of Enterprise Development (PARP). The number of start-ups and scale-ups registered in the Crunchbase and Dealroom joint database accounted for 343 companies, which broadly corresponds to the existing research and innovation (R&I) potential of business enterprises in the region. Altogether there are some 150 start-ups operating in the region and several dozens of start-ups are established each year.

Based on the existing evidence, it is found that Pomorskie is dynamically developing and evolving towards a mature entrepreneurial ecosystem. Despite a large number of entities involved in the regional entrepreneurial ecosystem, there is a general lack of service providers for start-ups and scale-ups from the private sector.

The results of the SWOT analysis are presented in the Table below as basis for co-creating interregional collaboration.

Table 1 SWOT of Pomorskie

Strengths	Weaknesses
<ul style="list-style-type: none"> The Tri-City is considered as a thriving centre of entrepreneurship A large number of entities involved in entrepreneurial ecosystem A portfolio of portfolio of large corporations in the Pomorskie region A strong track record and achievements in providing support for development of entrepreneurship Relevance of a number of initiatives implemented in the region Stability in decision-making and strategic directions The regional authorities playing a catalyst role Scientific and research potential (presence of scientific and research institution) Well-developed research and business support infrastructure 	<ul style="list-style-type: none"> Low level of involvement of HEIs and scientific institutions in the development of entrepreneurial ecosystem Lack of services providers for start-ups and scale-ups from the private sector Lack of support for development of entrepreneurship competence (entrepreneurship curriculum) in HEIs Mismatch between supply for IT talents and demand driven by large companies Unsatisfactory level of key competences among students and graduates Lack of the merger and acquisition culture Lack of access to external sources of funding especially for companies with the growth potential Insufficient internationalisation among the stakeholders of the entrepreneurial ecosystem
Opportunities	Threats
<ul style="list-style-type: none"> Improving access to knowledge / specialised services Engaging large enterprises and SMEs Building upon the established collaboration with clusters Ensuring a better coordination of activities among the different institutions 	<ul style="list-style-type: none"> Public support mainly targeted at the existing companies and investors Centralisation of support for start-up and scale-ups Falling number of students at HEIs Lack of representative voice from the business sector

<ul style="list-style-type: none">• Improving curricula activities for entrepreneurship in HEIs• Attracting and retaining talents• Developing a new instrument targeted at companies with the growth potential and new forms of support for the acquisition of the existing businesses• Consolidating the entrepreneurial ecosystem in areas with a clearly defined thematic focus	<ul style="list-style-type: none">• Relying on the public sector intermediaries' support• Impact of COVID-19 on entrepreneurial activities
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1. INTRODUCTION

This report has been prepared in the framework of the project entitled 'Fostering collaboration through mapping, analysing, and interlinking of European Entrepreneurial Regions' launched by the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs and the Executive Agency for Small and Medium sized Enterprises (EASME). This project is funded by the COSME programme.

The objective of this project is to strengthen the impact of existing actions aimed at further developing start-up and scale-up support. It aims at fostering collaboration across the European Entrepreneurial Regions (EER) and developing and implementing concrete collaborative action plans that will foster scale-ups and entrepreneurs along common thematic priorities.

This project builds on the long-standing experience of the EER initiative of the Committee of the Regions. The EER label has been awarded to regions for the commitment and policies to make their region one of the most resilient and ambitious places in Europe with forward-looking actions. Strategic topic areas are identified based on mapping, analysing, and interlinking of EER labelled regions.

In this context, the objective of this report is to map the regional entrepreneurial ecosystems of the participating EER regions focusing on the analysis of their actors, policies and market-enhancing services and also exploring the potential linkages within and across the regional entrepreneurial ecosystems.

Phase I of the project ran between January 2019 and July 2020, with the involvement of 10 EER Regions: Catalonia, Île-de-France, Lower Austria, Marche, Lombardy, Western Greece, Central Macedonia, Flanders, North Brabant, Northern and Western Ireland.

Phase II of the project started in September 2020 and will last until January 2022. It welcomed another 8 regions that will build on the work from phase I. The new regions are Asturias, Valencia, Navarra, Helsinki-Uusima, Malopolska, Pomorskie, Gelderland and Northern Ireland. The latter regions will be further referred to as "EER II" regions in this report.

2. PRESENTATION OF THE REGIONAL ECOSYSTEM

Pomorskie is one of three Polish regions with a coastline, situated by the Baltic Sea. The region has a total population of 2,305,077 and covers an area of 18,310 square km. The capital of the region is Gdańsk, a city of 470,907 inhabitants. The regional economy is medium in terms of size and is characterised by a stable position. According to the latest available data (2018) the region of Pomorskie is ranked in 6th position out of 16 Polish regions in terms of size of GDP and the 4th as regards GDP per capita.¹ The distance to the EU average in terms of GDP per capita was reduced from 59% in 2009 and reached 69% in 2018 placing Pomorskie in 4th position among the Polish regions.²

Almost half of the regional GDP is generated in a metropolitan area of Gdańsk-Gdynia-Sopot, known also as the 'Tri-City', where the highest level of GDP per capita is also recorded. In some areas Gdańsk and Gdynia naturally compete but attracting the investors is an area where the cities mutually support each other. Branding is recognised by the regional stakeholders as a priority to achieve a greater visibility of the Pomorskie region.

The real growth rate of the regional GVA was 4.6% in 2017 which is similar as the country average (4.8%). There has been an observable upward trend since 2013 which was the year with the lowest growth during the last decade. The region ranks the 6th in terms of the value of exports per capita and the 5th in terms of the share of exports in GDP.

The regional industrial portfolio of Pomorskie is quite differentiated with a decreasing role of industry and a rising role of the services sectors (and in particular Business Process Outsourcing and Shared Service Centres and Knowledge Intensive Business Services) in both employment and value-added generation. The traditional industries of the region are associated with the sea and include the maritime industries, petrochemical, shipbuilding, electromechanical, construction, wood and furniture, and tourism. Important sectors also include electronics, logistics, modern services for business, ICT, biotechnology, and light chemistry as well as agri-food processing (including fish processing). Partly, these sectors fall within the four areas of Pomorskie Smart Specialisation, namely 1) Offshore, port and logistics technologies, 2) Interactive technologies, 3) Eco-effective technologies, and 4) Medical technologies. Developing potential in the areas of logistics, maritime and offshore fiber is particularly important and strengthening the regional competitive advantages in general. Pomorskie is also one of the leaders in renewable energy sources production in Poland with a share of over 50% of total energy production. The Pomeranian companies already specialise and carry out external orders related to the development of wind farms that will start operating in 2025 (Invest Pomerania, 2020b).

The ongoing project 'Pomorski Smart Progress' overseen by the Marshal Office serves the purpose of searching for and identification of the possible new thematic priority areas or validation of the scope of the selected regional specialisations.

The cities of Copenhagen and Gothenburg are often cited as model cities for future development of the Tri-City. Pomorskie is ranked the 3rd in terms of R&D expenditure in relation to GDP (1.08%) and per capita. Despite the fact that the region has maintained a relatively high share of business R&D expenditure and R&D employment (4th position) there is still insufficient cooperation between the scientific community and enterprises. Labour shortages have been identified as an issue in particular in industries such as construction, timber industry, ICT, business services, tourism, health, and logistics.

The region occupies the 3rd position on the composite indicator of entrepreneurship used by the Polish Agency of Enterprise Development (PARP), following the voivodeships of Mazowieckie and Wielkopolskie. With a result of 60.96, the region is also ranked the 3rd

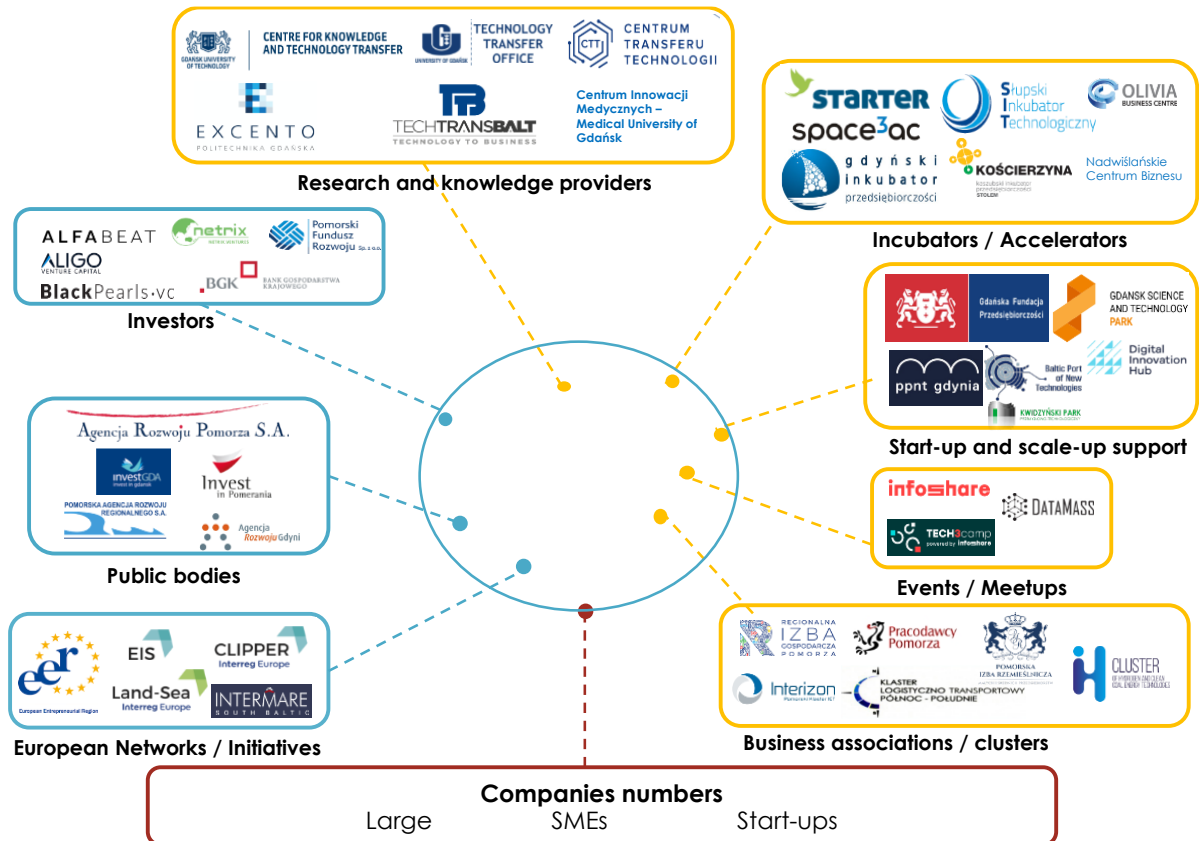
¹ Purchasing power standards (PPS, EU27 from 2020)

² Percentage of the EU27 (from 2020) average

in the country in terms of the number of active small or medium enterprises per 1,000 inhabitants following the same aforementioned regions. The available data of non-financial enterprises shows the increase of entrepreneurial activity but also a relative short duration. The number of newly created companies per 1,000 inhabitants accounted for 8.73 in 2018 which places Pomorskie on the 2nd position among the Polish regions. However, Pomorskie is also in the group of regions including Zachodniopomorskie and Wielkopolskie which recorded the lowest survival rate of companies (below 60%). In terms of start-up density, the Pomorskie region ranks on the 7th position among the Polish regions (Start-up Poland, 2019a). The effects of the pandemic began to be felt in the region and the monitoring of recent trends points to careful optimism.

The figure below presents an overview of the ecosystem.

Figure 1 Entrepreneurial ecosystem in Pomorskie region



Source: Author

3. THE ACTORS IN THE ENTREPRENEURIAL ECOSYSTEM

3.1. Market services and ecosystem builders

Building the entrepreneurial ecosystem in the Pomorskie region is ensured by a large number of publicly funded intermediary organisations, in addition to various bottom-up initiatives.

3.1.1. Market services for start-ups and scale-ups

The **Gdańsk Entrepreneurial Foundation** (GFP)³ was established in 2005 to support and develop entrepreneurship. It provides different forms of support, including mentoring, training, consultancy, building and developing clusters, offices for young companies and those with a mature market, creative workshops, and networking. The GFP operates the Incubator Starter⁴, which is a start-up hub accelerating start-ups and educating future entrepreneurs. It also participates in a number of projects related to entrepreneurship; for example, the Interreg Central Europe project CROWD-FUND-PORT⁵, and Startup Inspire which is a pilot project supporting the start-up environment in a metropolitan area of Gdańsk-Gdynia-Sopot.

There are the following four main park initiatives in the Pomorskie region which are the effects of Structural Funds investments during the 2007-2013 programming period. The **Gdańsk Science and Technology Park** (GPN-T)⁶ has a status of a special economic zone and provides services to companies from different sectors, in particular biotechnology, biomedicine, electronics, IT and mechanical engineering. It provides support at different stages of innovation process starting from the creation of an idea, the development and demonstration works and the implementation of research results. The Pomeranian Regional Development Agency (PAAR) acts as the manager of the park and also oversees the Technology Incubator in Słupsk.⁷

During the period 2012-2014, the GPN-T carried out a project 'ICT Startup' with the objective to develop the Pomeranian ICT Cluster Interizon. The Park initiates and implements the acceleration programmes dedicated to start-ups, such as **Space3ac**. This is an initiative implemented as part of the Scale-up competition organised by the Polish Agency for Enterprise Development (PARP) in the framework of the national programme 'Start in Poland'.⁸ The objective is to develop the Polish space sector by combining the needs of industry and state-owned companies with the potential of start-ups, experts' experience, and financing. In terms of the outcomes, specific solutions were designed by 23 start-ups, tailored to the needs of 11 large enterprises, including PZU Lab, Grupa LOTOS, Orange Polska, the Port of Gdynia Authority, the Port of Gdańsk Authority, International Paper - Kwidzyn, Celsa Huta Ostrowiec, Pol-Miedź Trans, OT Logistics, X-Kom, and the Maritime Institute. In total, nearly 170 start-ups applied for two editions of this programme. 27 of them qualified for the acceleration phase and received the financial and advisory / mentoring support. The financial allocation accounted to 4 million PLN or approximately €910k and on the average each team received the support for the total amount of 160 – 200k PLN or €36 – 45k.

It is worth noting that the headquarters of the Polish Space Agency⁹ is located at the GPN-T. The GPN-T has also established collaboration with a number of clusters in the region, including the Interizon - Pomeranian ICT Cluster, the Baltic Sea and Space Cluster, and the Baltic Eco-Energy Cluster (BKEE).

³ See: <http://gfp.com.pl/podstawy-prawne>

⁴ See: <http://inkubatorstarter.pl>

⁵ See: <https://www.crowdfundport.eu>

⁶ See: <http://qpnt.pl>

⁷ See: <http://www.sit.slupsk.pl>

⁸ See: <https://startup.pfr.pl/en/start-in-poland/#intro>

⁹ See: <https://polsa.gov.pl>

The **Pomeranian Science and Technology Park** (PPNT)¹⁰ in Gdynia is the oldest of the three science and technology parks in Pomorskie; it was established in 2001 and following an expansion in 2013, it is the biggest of its kind in Poland. The Park focuses on the development of high tech, mainly in the areas of biotechnology, environmental protection, computer science and electronics, as well as telecommunication and industrial design. Apart from the office infrastructure support, the PPNT provides specialised laboratory equipment, equipment for testing and demonstration, prototyping / design.

Since 2004 the Park has managed the Innovation and Entrepreneurship Incubator that provides support to university graduates who are interested in launching their own economic activity. Currently, it operates the Co-working Start-up Space and implements the sixth edition of the Start-ups Wanted Acceleration Programme, which aims at stimulating the development of local and regional entrepreneurship by supporting the participants in developing business projects, with particular emphasis on innovative projects. Following the participation in intensive trainings and mentoring, the selected start-ups receive free access to co-working space during the period 6-12 months.

The **Baltic Port of New Technologies** (BPNT) is a project of the Pomeranian Special Economic Zone (PSSE), supporting the reconstruction and development of the shipbuilding and maritime industry, which brings together the largest companies of these industries in the region.

The **Kwidzyn Industrial and Technological Park** (KPPT)¹¹ is a centre for innovation in the field of green energy and energy management technology. It is an initiative with local scope and was established with the assistance of the EU Structural Funds, notably the Regional Operational Programme for the Voivodeship of Pomorskie 2007 – 2013. As part of the Entrepreneurship Incubator, companies receive access to modern equipped office, production, and service spaces on preferential conditions.

According to the recent analysis (Invest in Pomerania 2020a), out of 158 business service centres operating in the Tri-City, 64% are IT and R&D centers. Operating within the **Olivia Business Centre**, the Q4 was founded by a private entrepreneur in 2015. It is the largest co-working space in Gdańsk. By 2017, the centre had more than 500 members, including over 60 Polish and international start-up companies and several NGOs. In the centre, start-ups are provided with opportunities to interact with more established businesses in the Business Centre office complex (OECD, 2019).

Besides the above-mentioned incubators, the Pomorskie region has other incubators, including the **Entrepreneurship Incubator in Gdynia**¹² managed by the Economic Foundation (FG), **Kaszubski Inkubator Przedsiębiorczości STOLEM**¹³, and **Nadwiślańskie Centrum Biznesu**.¹⁴

The **Pomeranian Regional Chamber of Commerce** (RIGP)¹⁵ is an organisation of economic self-government, operating since mid-2008. It associates on a voluntary basis entrepreneurs running a business in the Pomorskie Region. Altogether, it brings nearly 200 business entities and organisations integrating employers from the region.

Currently, it undertakes a project 'Together to profession' the aim of which is to establish long-term cooperation between vocational schools, students, and employers in key industries. It acts as the manager of Pomeranian Hydrogen Valley. Launched in 2017, the objective of the cluster is to increase the importance of hydrogen technologies and clean coal technologies, by supporting its members and cooperating entities in the development of innovative solutions for energy efficiency and low-carbon economy.

¹⁰ See: <https://ppnt.pl>

¹¹ See: <https://kppt.pl>

¹² See: <http://inkubator-gdynia.pl>

¹³ See: <http://www.inkubatorokoscierzyna.com.pl>

¹⁴ See: <http://inkubatorodzierzgon.pl/>

¹⁵ See: <https://rigp.pl>

The cluster will operate both the Research and Development Centre and the Technology Transfer Platform to support companies' work on technology projects, and at a later stage, to support testing and verifying of new solutions. The RIGP also acts as the coordinator of the two RIS3 platforms: 3 - Eco-effective technologies in the generation, transmission, distribution, composition of energy and fuels, and in construction; and 4 - Medical technologies in the area of civilisation-and ageing-associated diseases.

Other business associations include **Pomeranian Employers (PP) and Pomeranian Chamber of Crafts SMEs (PIR MSP)**. Established in January 2019, the **Polish-Luxembourg Chamber of Commerce** brings together entrepreneurs and facilitates cooperation between investors and start-ups.

As presented, there is a general lack of service providers for start-ups and scale-ups from the private sector in the strict sense. The existing evidence points to an important role played by the clusters in providing the advisory services to business enterprises albeit the support for the development of start-up and scale-ups could be further enhanced. As part of financing development and investment activities, start-ups can use venture capital funds such as: **Aligo**¹⁶, **Alfabeat**¹⁷, **Black Pearls**¹⁸, and **Netrix Ventures**¹⁹. The latter is an investment fund operating since 2017, focused on investments in early-stage projects. It acts as the Financial Broker based on the agreement with the National Bank of Economy (BGK) which plays a role of the Fund of Funds Manager in the Pomorskie region.

Despite the absence of private sector providers, the Pomorskie region hosts a variety of cyclical events with the aim of integrating the start-up community and promoting the exchange of good practices among entrepreneurs. The events among others include: the **DataMass Gdańsk Summit**²⁰, which is the biggest data conference in the Northern Poland to promote knowledge and experience in designing and implementing tools for the analysis of big data volumes, and the **Infoshare**²¹ which is the largest technology conference in Central and Eastern Europe taking place in Gdańsk. This year, the new form of the meeting (online) was introduced by Infoshare, and a record number of start-up applications (in total 650) was submitted for the competition organised as part of the event. The Infoshare also runs the Academy re-training people in order to fill the competency gap.

There is also a number of initiatives focused on aspects of digital entrepreneurship and transformation in the Pomorskie region, such as **Tech3camp**²² - the organisation of meetings for the IT community, as well as product and project managers, UX-designers and graphic designers, **Hackerspace Trójmiasto**²³ - a bottom-up initiative and space connecting specialists from many technical sciences, **PLUGin**²⁴ - is an international community, uniting and supporting the Polish innovation diaspora with offices in Gdańsk around the world around the world, **Startup Inspire**²⁵ - an initiative overseen by the Incubator Starter in cooperation with the city of Gdańsk support the Tri-City start-up environment, **Interizon - the ICT Pomeranian Cluster**²⁶, and the **Startup Hansa**²⁷, which aspires to connect Central European cities to the major business and technology hubs around the world to create a sustainable start-up ecosystem.

¹⁶ See: <https://aligo.pl>

¹⁷ See: <https://alfabeat.com>

¹⁸ See: <https://blackpearls.vc>

¹⁹ See: <http://netrix.ventures>

²⁰ See: <http://summit.datamass.io>

²¹ See: <https://infoshare.pl>

²² See: <https://tech.3camp.pl>

²³ See: <http://hs3.pl>

²⁴ See: <https://weareplug.in>

²⁵ See: <http://inspire.inkubatorstarter.pl/en>

²⁶ See: <https://interizon.pl>

²⁷ See: <https://startuphansa.com>

3.1.2. Public sector intermediaries' support to start-ups and scale-ups

Established in 1992, **Pomerania Development Agency**²⁸ (ARP) is the institution active in supporting entrepreneurship in Pomorskie and is a major partner to the local authorities in fuelling regional development. During the 2007-2013 programming period it implemented the policy support measures for companies and institutions supporting the development of entrepreneurship under the Regional Operation Programme of the Voivodeship of Pomorskie (RPO) and the national Operational Programme Innovative Economy (POIG). During the 2014-2020 programming period it acted as the intermediary institutions for the selected policy measure in support innovative activities in companies, science-industry cooperation, and business support grants for companies with a high-growth potential. It is overseeing the management of the Capital Fund investing in innovative business ideas, managing the Investors' Care Service responsible for economic promotion of the region and direct foreign investments, or provision of information, consulting, and training services for the SME sector. Since its launch in 2001, it contributed to the establishment of some 38 companies in different sectors, including ICT, biotechnology, and medical industries, according to our interviewee.

Currently, it implements a number of projects, including:

- Pomeranian Export Broker - supports the export activity of companies from the region²⁹;
- Everywhere International SMEs - creates joint solutions for the development of regional pro-export policy³⁰; and
- SPECTRUM - the Pomeranian system of providing specialist consulting services for SMEs.

There are several other business supporting institutions operating in the Pomorskie region.³¹ The APR is the coordinator of the **Invest in Pomerania**.³² It is a regional non-profit initiative that supports foreign investors to implement investment projects in Pomorskie. It acts as a 'one-stop shop', providing support at every stage of the investment process. Since its creation in 2011, it has attracted investors and contributed to the creation of more than 15 thousand jobs. The metropolitan area of Gdańsk-Sopot-Gdynia was named one of the top 10 European Tech Cities of the Future for 2020/21 for FDI strategy (4th position), according to the ranking prepared by fDi Intelligence division of the Financial Times.

The **Gdynia Development Agency** (ARG)³³ is an institution supporting the development of SMEs in the creative industries, health industry and science and knowledge sectors. The **Economic Foundation** (FG)³⁴ oversees, inter alia, the Entrepreneurship Incubator in Gdynia. The FG is mainly involved in projects aimed at professional activation of citizens. The **InvestGDA Regional Development Agency**³⁵ is the initiator of projects related to the development of entrepreneurship and innovation in Gdańsk. As part of investor support, it offers strategic, investment and financial consulting services. The **Pomeranian Regional Development Agency** (PARR)³⁶ is responsible for initiating, promoting, and supporting all initiatives serving the broadly understood regional development. It manages the Słupsk Special Economic Zone and the Słupsk Technology Incubator.

Previous research carried out by the OECD (2019) pointed out that networks in Pomorskie need to be strengthened across businesses, universities, and research

²⁸ See: <https://www.arp.qda.pl>

²⁹ See: <https://investgda.pl/en/broker>

³⁰ See: <https://www.interregeurope.eu/eis/>

³¹ See: <https://www.arp.qda.pl/1999,o-systemie-spektrum>

³² See: <https://investinpomerania.pl>

³³ See: <https://arg.qdynia.pl>

³⁴ See: <http://funqo.com.pl>

³⁵ See: <https://investgda.pl>

³⁶ See: <https://www.parr.slupsk.pl>

organisations. It also noted that local networks among entrepreneurs and between entrepreneurs and HEIs and large firms are already fairly strong in the ICT sector.

The existing evidence gathered in the framework of the present assignment points out that there is quite good information exchange among the stakeholders of the entrepreneurial ecosystem. There has been a stability guaranteed over the last years and a continuity towards achieving the strategic directions. It deserves an explanation that according to the current national legislation the membership in associations representing entrepreneurs is not obligatory in Poland. As a result, there is a lack of representative voice from the business sector.

So far, the public sector intermediaries' support has been mainly targeted at the existing companies and investors and much lesser extent at start-ups and scale-ups. The region is not exclusively focused on attracting only large investors and recognises an important role played by scale-ups. AirHelp, a company established by a Danish entrepreneur in 2013 which became the world's largest air passenger rights advocate is an example of successful scale-up in the region. Recently, there is a number of interesting developments taking place as regards the support for start-ups and scale-ups in the region and one can expect further intensification of activities in the future. There is a general consensus among the consulted stakeholders that there is a scope for continuous development of the entrepreneurial ecosystem. The authorities of Pomorskie are engaged in collaboration with the relevant stakeholders and committed to developing favourable ecosystem conducive for the development of start-ups and scale-ups in the region.

3.2. The role of entrepreneurs (start-ups and scale-ups)

3.2.1. Overview of the entrepreneurial dynamics

In 2018, there were more than 142 thousand enterprises operating in the Pomorskie region and the SME sector constitutes the vast majority of enterprises. The most numerous groups are micro-enterprises (138,029), followed by small (3,243), medium-sized (991), and large enterprises (229).

In terms of the number of the newly created enterprises, the Pomorskie region recorded a downward trend (-7.2%) in enterprises registered during the period 2019-2018 which is higher than the average observed at the national level (-3.6%). It is worthwhile noting that the number is higher than at the moment of the financial crisis in 2009.

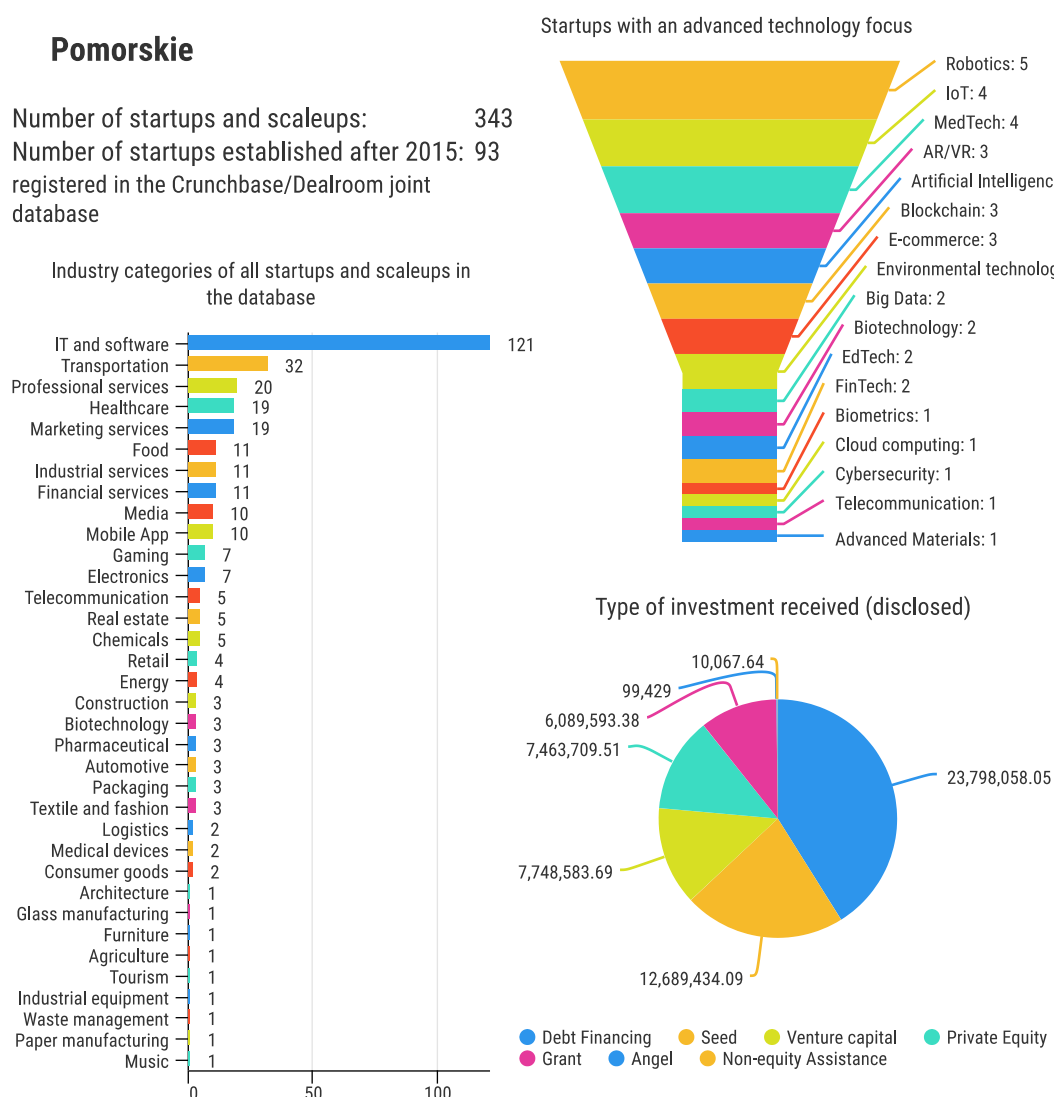
The sectors which recorded an increase during the period 2019-2018 include: production and supply of energy (159.3%), public administration (35.3%), and water supply and waste management (34.6%). Comparatively, the sectors which recorded the highest decrease in the number of newly registered companies include financial and insurance (-25.3%), activities related to culture, entertainment, and recreation (-15%), and other service activities (-14.8%).

Another observable trend is a decrease (-37.6%) in the number of enterprises which discontinued their business activities. In the manufacturing industries, the number of enterprises which stopped their activities accounted for 1,956 in 2019. This is lower than the result for the previous year (3,781) as well as ten years earlier (2,244). Given the status of self-employed, the available data should be treated with some caution. The self-employed in Poland accounts for over 20 percent and it is one of the highest rates in Europe. This form of employment gives great flexibility and fiscal benefits; however, it should be noted that new entrepreneurs are sometimes self-employed providing services to their former employers which lowers the cost of employment.

Overall, the situation should be considered favourable due to the positive balance of newly registered entities in comparison with the number of entities which discontinued their activities. The earlier analysis (OECD 2019) found that healthy entrepreneurship dynamics are illustrated by a dense enterprise population, high numbers of enterprise births and a significant presence of high growth enterprises. The figure below provides overview of entrepreneurial performance of the Pomorskie region based on the

Crunchbase and Dealroom analysis. More detailed information on the methodology can be found in a separate note which is presented in Appendix III.

Figure 2 Overview of entrepreneurial activities in the region



Source: Technopolis Group analysis based on Crunchbase and Dealroom, 2020

As shown in the figure above, there are some 93 start-ups operating in the region and this number can go up to as much as 150 according to the stakeholders consulted in preparation of the present report. The consulted stakeholders pointed out that there are fewer start-up companies which developed their own technologies and/or obtained the external funding. The interview results also indicate that there are several dozen start-ups established each year. The number of start-ups and scale-ups registered in the Crunchbase and Dealroom joint database accounted for 343 companies, which broadly corresponds to the existing R&I potential of business enterprises operating in the region. The highest number of start-ups and scale-ups is found in the ICT sector. The region is characterised by a relatively high concentration of ICT companies, and it is known for

expertise in this area. This is reflected to a large extent when analysing the technology focus of start-ups. The total value of disclosed investments is estimated only at approximately at €58 million which is less than in other more developed regions, even though it needs to be acknowledged that the level of investment is probably underestimated as the public funding is not fully accounted for. The two prevailing sources of funding were debt financing and seed funding and to a lesser extent venture capital and private equity. This confirms a generally held view that the involvement of private investors and VC market is in a phase of development.

3.2.2. The landscape of start-ups and scale-ups

Examples of recent start-ups established in the Pomorskie region include UXPin³⁷ - developed a code-based UX design tool for prototyping, documentation and design systems, dr Poket³⁸ - developed a cutting-edge dispensary solution of medications, Just Join IT - created a job market map for Polish programmers, Toucan Systems³⁹ - specialised in interactive IT solutions dedicated to cultural institutions, science centres and the promotional and event industries, Waves of Harmony⁴⁰ - provides a programme of innovative trainings to companies, Grywit⁴¹ - offers services in the field of strategy building, application development and web platforms that increase engagement and achievement of goals with the help of mechanisms applied in games, SentiOne⁴² - developed an internet monitoring tool for companies, and Just Join IT – which developed job board for IT industry in Poland.⁴³

The companies have a general good access to infrastructure and services, such as design, testing, prototyping, marketing, and internationalisation. However, the system is still too complex with many stakeholders involved which is not evident from the point of view of start-ups and scale-up companies how make the most of available support. The ecosystem has evolved considerably in the past 5 years and there has been a lot of experience acquired in the implementation of instruments in support of start-up and scale-ups during the 2014-2020 programming period.

It is also worthwhile pointing out that the results of recent survey among the entrepreneurs indicate to a general more favourable opinions about the anticipated business performance than observed at the national level. Despite that there are only few examples of start-ups that succeeded in scaling-up, their success nurtures the ecosystem by bringing a greater visibility and outreach.

3.3. SMEs and large companies in the entrepreneurial ecosystem

3.3.1. Established enterprises' interaction with the ecosystem

The SMEs operating in the Pomorskie region do not have influence on start-ups and a similar situation can be observed in the case of large companies. As pointed out during one of the interviews, the cooperation depends on the possibility of obtaining a joint grant.

3.3.2. Large companies' interaction with the ecosystem

Despite a lack of empirical evidence on the role of large companies in the entrepreneurial ecosystem, there is some anecdotal evidence gathered as part of interviews carried out in the framework of this assignment pointing out to a relatively active role played by the following large companies:

³⁷ See: <https://www.uxpin.com>

³⁸ See: <http://drpoket.com>

³⁹ See: <https://www.toucan-systems.pl>

⁴⁰ See: <http://wavesofharmony.pl>

⁴¹ See: <https://www.grywit.pl>

⁴² See: <https://sentione.com>

⁴³ See: <https://justjoin.it>

- Polpharma - established in 2001 the Science Foundation which provides funding for research projects and support young scientists;
- Intel - supports for local communities and increase the impact by expanding skills-based volunteering; and
- The Port of Gdańsk Authority - takes active part in educating young people and increasing the quality of education of our future employees by introducing elements of practical knowledge of the maritime economy sector into theoretical educational activities).

It needs to be acknowledged that building internal position, generating profits, and achieving own goals are the prime motivations of large companies. The OECD study (2019) also found that large companies could be more engaged in the local entrepreneurship ecosystem. Having said this, the impressive portfolio of large corporations in the Pomorskie region offers unique opportunities for the development of the regional entrepreneurial ecosystem.

3.4. Research System and Universities

3.4.1. General overview of the research and higher education performance in the region

There are eight public higher education institutions (HEIs) in the Pomorskie region.

The **University of Gdańsk** (UG)⁴⁴ is a dynamically developing HEI and the largest university in the Pomorskie region. It offers education in nearly all fields of academic knowledge. It comprises of eleven faculties with over 25 thousand students, doctoral students, and post-graduates, who are taught by more than one thousand seven hundred academic staff. The UG has carried out 76 projects financed as part of the Framework Programmes and the Horizon 2020 Programme. It is also one of the most active Polish universities in implementing projects as part of the Structural Funds – the European Social Fund, the European Regional Development Fund and community initiatives. The patenting activity is relatively low given high scientific and research potential. In 2016, the UG accounted for 7 patents. The achievements of the Technology Transfer Office of the University of Gdańsk (CTT UG) are: 85 patent applications, 26 international patent applications, 33 active patents, 6 spin-off companies, 144 signed contracts, and 104 requests from the industry.

The **Gdańsk University of Technology** (PG)⁴⁵ is a leading technical university in Poland. For many years, it has been effectively cooperating with the economic environment, implementing grants and research services. The University comprises of 9 faculties, 37 fields of study, nearly 23,000 students, and 1,200 academic teachers. The university has been ranked on the 3rd position for the fifth consecutive time in the Polish Ministry of Science and Higher Education ranking of the most popular universities. It is also ranked on the 2nd place and 1st among the technical universities in the national competition organised by the Ministry of Science and Higher Education 'Excellence Initiative – Research University' the objective of which was to select and support the 10 best universities that will become research centres able to compete with the best universities. It is worth mentioning that one of the selected Digital Innovation Hubs (DIHs) is located in Gdańsk and is implemented by the consortium of VoiceLab.AI and the PG. The thematic focus of DIH4.AI's is on artificial intelligence, robotics, Internet of Things, and cybersecurity. Following an unsuccessful attempt to obtain support for a second DIH, a coalition is now being built for future programmes.

The **Medical University of Gdańsk** (GUM) is the largest medical university in northern Poland and plays a role of the EIT Health Hub). **Gdynia Maritime Academy** and **Gdynia Naval Academy** run a number of unique maritime, cybersecurity and naval

⁴⁴ See: <https://ug.edu.pl>

⁴⁵ See: <https://pg.edu.pl>

studies in the country. In addition, there are three research institutes (the Maritime Institute in Gdańsk, the Maritime Fisheries Institute, the National Research Institute - the Institute of Maritime and Tropical Medicine in Gdynia, three scientific units of the Polish Academy of Sciences (Robert Szewalski Institute of Fluid Mechanics, Institute of Oceanology, and five other public and private research units (including Ship Research Centre SA Research and Development Centre, Innovation Centre STB sp. Zoo, Research and Development Centre for Plate Wood Industry Ltd.).

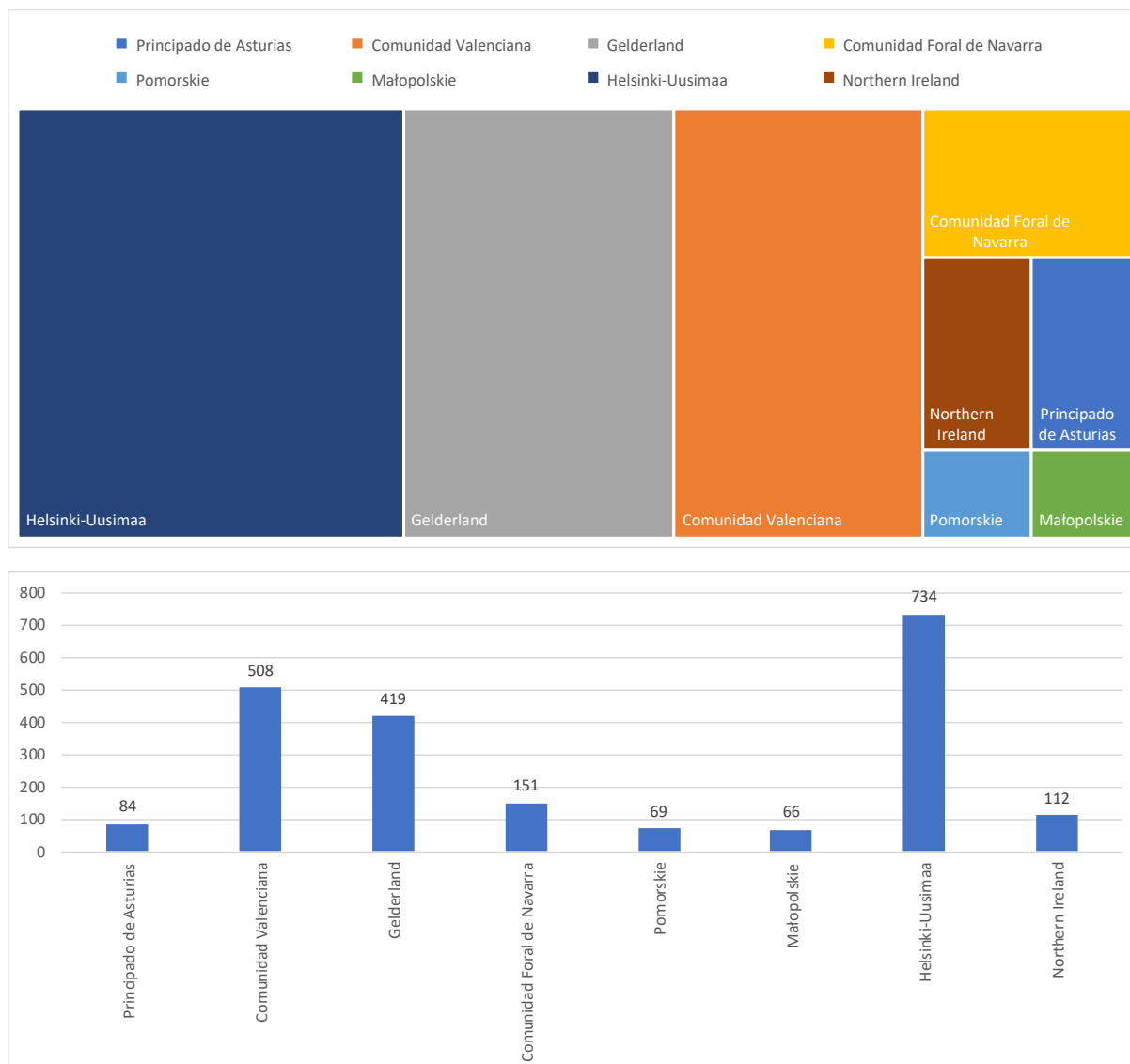
As shown in the Table below, the level of patenting activity is clearly below the average values of EER regions. Given the existing potential in the region, the level of participation in H2020 projects is also limited. During the period 2014-2018, the total funding of H2020 projects accounted for only €18.97 million which represents 2.1% of funding in the group of EER regions. The top sectors of 2020 participation are Health, Energy, Advanced Manufacturing, and ICT. In comparison with the average value in EER regions, the funding is at much lower level. Topmost involved areas in co-application are Poland in general, Basel, Mannheim, Canada, Madrid, Northern Ostrobothnia, Hauts-de-Seine, and L'Aquila.

Table 2 Overview of research sector performance in the region

Indicator	Value	Average value in EERII regions
Total nr of EPO patents	363	2.437
Total nr of co-applied patents	38	142
Share of co-applied patents	10%	15%
Top 3 regions for co-application	Basel, Mannheim, Warsaw	n. a
Total nr of H2020 participations	69	268
Top sectors of H2020 participations	Health (4.833.536), Energy (4.053.840), Advanced Manufacturing (3.895.691), ICT (3.099.843)	Health (24.018.857), Energy (25.179.058), Advanced Manufacturing (27.373.560), ICT (26.136.582)
Top regions of cooperation partners in H2020	n.a.	n.a

Source: Author based on data compiled by Technopolis Group and ISMERI Europa

Figure 3 H2020 total funding and participation⁴⁶



Source: Ismeri Europa

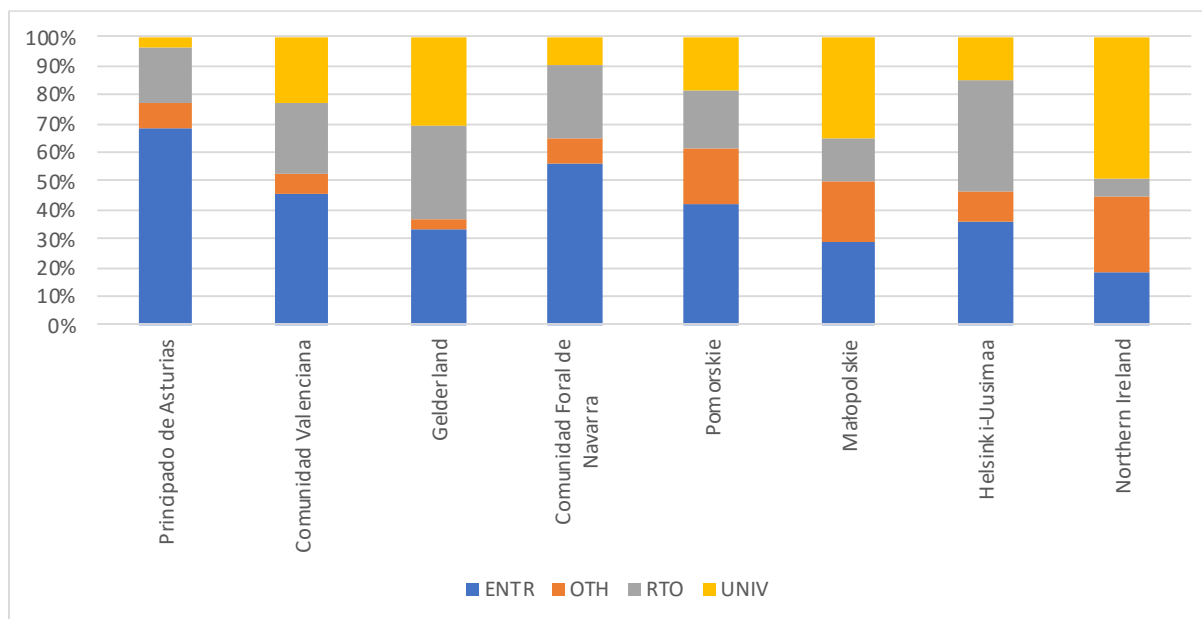
The results of the analysis presented in the figure below, show that the business sector was the type of organisation most frequently participating in H2020 projects, which confirms an important role played by business enterprises in the region. As shown in the following figures, enterprises accounted for the highest share of funding, following the universities and RTOs. In terms of the sectoral focus, the funding has been quite evenly distributed across sectors. It is also worthwhile noting that Health, Energy, and Advanced Manufacturing accounted for approximately about 46.5% of total funding.

⁴⁶ Methodological note:

years considered in the calculations: 2014-2018 (projects which started in 2014-20218)

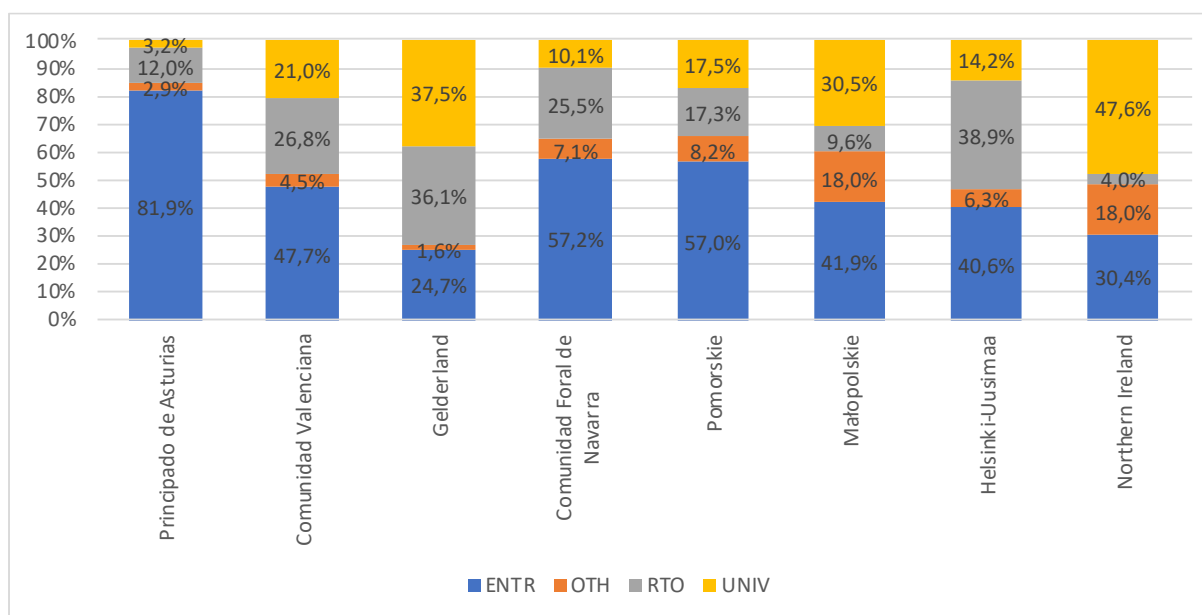
calls considered in the calculations: - FET, Future and Emerging Technologies; - LEIT, Leadership in Enabling and Industrial Technologies - SME Instruments – Phase II; - Societal Challenges (excluding SC6 - Europe in a changing World); - FTI, Fast Track to Innovation

Figure 4 Participation (total) by type of organisation in H2020

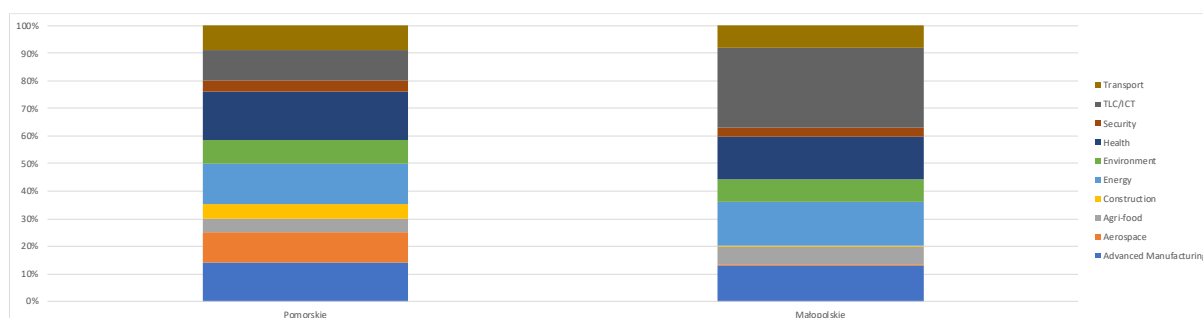


Source: Ismeri Europa

Figure 5 Distribution of funding (% EU Contribution) by type of organisation



Source: Ismeri Europa

Figure 6 Concentration of H2020 funding by sectors⁴⁷

Source: Ismeri Europa

3.4.2. The landscape of R&I ecosystem players

Each of the main HEIs has its own technology transfer office, holding company responsible for the commercialisation of R&D results, academic entrepreneurship incubator, and career office. The CTT UG⁴⁸ operates on the university wide level, combining science with the economy therefore provides services, advisory, information, training, and promotion to the UG scientific staff. The main task of the CTT UG is the commercialisation of the research results and development work performed at the UG. The process of technology transfer is well-defined and TechTransBalt is the university holding company responsible for the commercialisation of the results of scientific research and development works, in particular taking up shares in capital companies or creating capital companies, which are established in order to implement the results of scientific research or development works carried out at the university. Also, the Career Office of the UG offers students and graduates assistance and support in taking their first steps on the labour market.

The Centre for Knowledge and Technology Transfer (CWTT)⁴⁹ is a unit set up to manage the results of research conducted at the PG, to implement cooperation with the economic environment and to promote academic entrepreneurship. The PG has comprehensive rules and regulations for managing and commercialisation of intellectual property at the university. The CWTT has the Academic Economic Incubator which was developed within the national initiative 'Academic Incubator of Entrepreneurship' (AIP). The incubator provided support to young, interdisciplinary teams of students and employees aspiring to set up their own start-ups. Currently, CWTT is implementing the E-Pionier pilot project of the National Centre for Research and Development (NCBiR) which aims at stimulating the potential of talented programmers to increase the use of digital solutions in administration and economy. It organises the competition 'Swallow of entrepreneurship' which is addressed at students and PhD students to present original and innovative business idea. It also carries out the project Incubator of Innovation 4.0 which is aimed at increasing the technology readiness level and support the management of R&D results, mainly in the area of commercialisation. Additional support for students and graduates is provided by the Career Centre. As of future plans, it is foreseen to establish the Proof-of-Concept Fund and the start-up school at the university.

The science and HEI sector could open up to the cooperation beyond the existing networks and play a more active role in the development of the regional entrepreneurial ecosystem. The previous research on the Polish science and higher education system (Gulda et. al, 2017) found that the existing framework conditions at the national level were not conducive to commercialisation. Following the reform during 2010-2011, numerous support measures contributed to the transformation of HEIs into

⁴⁷ Methodological note: Each individual H2020 project can be relevant to more than a single sector. As a consequence, the sectoral amounts in the above table do not necessarily sum up to the totals shown in the sheet "TOTAL funds and participations".

⁴⁸ See: <https://ctt.ug.edu.pl>

⁴⁹ See: <https://ctwt.pg.edu.pl>

entrepreneurial universities, engaged in knowledge transfer and closer to industry. The effectiveness of these measures remains limited, but they have contributed to institutional changes (including the establishment of technology transfer centres, special purpose vehicles – university holding companies – and numerous academic spin-offs). The overall effectiveness of these measures could be considered limited and substantial public investments have failed to bring about major changes in the motivation, perception and behaviour of researchers and entrepreneurs, or organisational practices. Unlike almost all EU countries, the legislator initially intended to assign the ownership of IPR (intellectual property rights) to university employees (i.e., introducing the so-called professor privilege) which increased the administrative burden on universities. Another barrier to technology transfer in public science institutions is the requirement of formal valuation of IPR before conducting sales transactions which is governed by strict national regulations limiting the necessary flexibility in technology transfer negotiations.

During a relatively short time, the HEIs learned how to operate within the existing legal framework and only the rules related to public procurement are viewed cumbersome especially for relatively small R&D services. Said this, the main barriers to technology transfer are mainly of organisational and competency nature. The objective of the most recent reform, known as the Act 2.0 which started to be gradually introduced in 2019 bring important changes to the functioning of the system of science and higher education institutions; however, it is still too early to assess their impacts on technology transfer activities. There is an attempt to foster science-industry cooperation, but the details of the financing collaborative R&D are not known yet.

4. FRAMEWORK CONDITIONS FOR ENTREPRENEURSHIP

4.1. Human capital

4.1.1. Overview of human capital assets in the region

The number of employees in the Pomorskie region accounted for more than 1 million in 2018 (7th position in the country) and for the first time in 2017 was higher than the EU average. The share of population in the age group < 18 years was 19.6% in 2018 which was the highest result in the country. On the other hand, the percentage of people of working age is decreasing (60.3% in 2018). In this age group, the Pomorskie region had a slightly negative balance of migration abroad and ranks on the 9th position among the Polish regions. During the last decade, the number of people leaving the regions is decreasing which follows the same trend as observed at the country level.

According to the latest available data, the number of students at public higher education decreased during the last decade from 72,624 in 2008 to 55,052 in 2018. This reflects the demographic change and similar trend is observed in other Polish regions. During the same period, the total number of students in Poland at both public and private higher education institutions fell from almost 2 million to approximately 1.2 million. The Pomorskie region recorded a growth in terms of the number of PhD students from 338 in 2008 to 356 in 2018 as well as the number of habilitated doctors from 63 in 2008 to 104 in 2018. The percentage of foreign students at the HEIs in Pomorskie region is below the national average. The region ranks 9th among the Polish regions with some 3.2% of foreign students compared to the national average of 4.8% (OBIAS 2018).

As shown in the table below, the results of LinkedIn data analysis confirm that human capital is an important asset in the region. The number of professionals with advanced digital skills in manufacturing, ICT, and professional industries accounts for 8,532. It actually means that on average one person in ten employed in manufacturing, ICT and professional industries have such skills.

Table 3 LinkedIn data analysis – digital skills⁵⁰

Indicator	Asturias	Valencia	Gelderland	Navarra	Pomorskie	Malopolskie	Helsinki
Number of professionals with advanced digital skills in manufacturing, ICT, and professional industries	4045	18534	15665	2249	8532	18455	33079
Total number of professionals in manufacturing, ICT, and	48875	284854	226444	33501	81772	142022	182188

⁵⁰ Methodological note :

Technical industries: "Technical industries on LinkedIn that refer to industries related to: - Manufacturing (NACE code C); - Information and Communication (NACE code J); - Professional, scientific and technical activities (NACE code M)

Professionals with advanced digital skills: Number of LinkedIn users with at least one skill from the list of identified advanced digital skills: Artificial Intelligence, Big Data, Internet of Things, Cloud, Quantum Computing, Cybersecurity, Connectivity, Robotics, Advanced Manufacturing, AR/VR, autonomous vehicles

Total number of professionals: All LinkedIn users

Employment in the technical industries from Eurostat: "SBS data by NUTS2 regions and NACE rev2

Employment in: - Manufacturing (NACE code C); - Information and Communication (NACE code J); - Professional, scientific and technical activities (NACE code M)"

Indicator	Asturias	Valencia	Gelderland	Navarra	Pomorskie	Malopolskie	Helsinki
professional industries							
<i>Share</i>	8,3%	6,5%	6,9%	6,7%	10,4%	13,0%	18,2%
Employment in the manufacturing, ICT, and professional industries from Eurostat	72047	371503	193563	85167	244151	353065	200433
<i>Share of employment represented on LinkedIn</i>	67,8%	76,7%	100,0%	39,3%	33,5%	40,2%	90,9%

Source: Technopolis Group

Particularly, the Gdańsk University of Technology is a provider of high-class engineers. There is an observable competition especially for IT talents and given the number of large companies located in the region the demand is higher than the supply. Interestingly, sometimes reverse transfers take place. After a few years of work at corporations, the experienced employees decide to start their own business activities. In Poland, a new trend is discernible in the age structure of new entrepreneurs. The percentage of the oldest group of founders has increased substantially, from 14 percent five years ago to almost 24 percent today (Start-up Poland, 2019a). The average age of a fairly well-prepared entrepreneur is 40+ years. Due to the fact that the market is so attractive, there are not enough academic teachers in certain fields such as electronics. There are also problems with the access to highly qualified economic staff. As noted by the OECD study (2019) another bottleneck is a shortage of people with strong entrepreneurship skills (such as creativity, initiative, and problem solving) and digital skills.

As presented in the following table, the number of professionals with environmental skills calculated on the basis of LinkedIn data accounts for only 1,359, which represents 1.3% of total number of professionals employed in technical industries and is one of the lowest results among the EER participating regions. At the same time, eco-effective technologies are one of the four areas of Pomorskie Smart Specialisation, which includes the following two partnerships, namely SMART 3E construction – efficiency, ecology, energy, and Smart Energy and Fuel Technologies. The consulted stakeholders have not pointed out to specific gaps in environmental skills, but it is reasonable to assume that the demand for professionals with skills in this area will be growing in the future.

Table 4 LinkedIn data analysis – environmental skills⁵¹

Indicator	Asturias	Valencia	Gelderland	Navarra	Pomorskie	Malopolskie	Helsinki
Number of professionals with environmental skills in technical industries	2592	11533	14296	3042	1359	2038	12787
Total number of professionals in technical industries	61194	352685	273046	43455	101461	166500	205554
Share	4,2%	3,3%	5,2%	7,0%	1,3%	1,2%	6,2%
Employment in technical industries from Eurostat	148957	769640	352288	135808	411307	584479	368777
Share of employment represented on LinkedIn	41,1%	45,8%	77,5%	32,0%	24,7%	28,5%	55,7%

Source: Technopolis Group

⁵¹ Methodological note:

Technical industries: Technical industries on LinkedIn that refer to industries related to: - Manufacturing (NACE code C); - Information and Communication (NACE code J); - Professional, scientific and technical activities (NACE code M); - Electricity, gas, steam and air conditioning supply (NACE code D); - Water supply, sewerage, waste management and remediation activities (NACE code E); - Construction (NACE code F); - Transportation and storage (NACE code H); - Accommodation and food service activities (NACE code I)

Professionals with environmental skills: Number of LinkedIn users with at least one skill from the list of identified environmental skills

Total number of professionals in technical industries: All LinkedIn users in technical industries

Employment in the technical industries from Eurostat: SBS data by NUTS2 regions and NACE rev2, Employment in: - Manufacturing (NACE code C); - Information and Communication (NACE code J); - Professional, scientific, and technical activities (NACE code M); - Electricity, gas, steam, and air conditioning supply (NACE code D); - Water supply, sewerage, waste management and remediation activities (NACE code E); - Construction (NACE code F)

As noted in the Regional Development Strategy, Pomeranian students have unsatisfactory level of key competences, including especially soft ones, which should be shaped from an early age. It also points to a generational change in the labour market with many young and well-educated people entering the labour market. At the same time a progressive ageing process in the labour force is observed. Said this, these are the main factors alongside technological progress which necessitate adjustments in the business operations. The analysis of the labour market carried out by the Pomorskie region found employee shortages, in particular in industries such as: construction, timber industry, ICT, business services, tourism, health and logistics. There is a lack of support for attracting talents from other parts of the country and from abroad, helping and incentives to live in the region. There is a close cooperation between the schools, employees and labour market institutions and efforts are concentrated on establishing the regional system of vocational development.

4.2. Financial capital

4.2.1. General overview of access to finance in the region

The Regional Operational Programme for the Voivodeship of Pomorskie 2014 – 2020 (ROP) provided support for preferential loans and guarantees for development investments. The National Bank of Economy (BGK) as the manager of the Fund of Funds is the beneficiary of the EU Structural Funds. It selects the financial intermediaries and provides the financial resources for enterprises. Altogether there are seven financial intermediary institutions operating in the region. According to the latest available data (June 2020) some 1,873 entrepreneurs obtained loans for investments for the total amount of 261.3 million PLN or approximately €59 million on preferential terms. Additionally, 131 took advantage of bank guarantee for the total amount of PLN 54 million or some €12 million.

Established at the initiative of Pomorskie Voivodeship's self-government in 2015, the Pomeranian Development Fund (PFR) manages the contributions made to the financial engineering instruments under the ROP 2007-2013 through the financial intermediaries. It provides supports micro, small and medium-sized companies, and municipalities by providing financial solutions. It has provided support for some 1,427 loans and guarantees for the total amount of 159 million PLN or €36 million. The recent evaluation (PAG Uniconsult, 2018) found that there were considerable problems with selecting the financial intermediary institutions for the implementation of the equity funding instrument. Another (second) tender, despite extending the deadline failed due to the lack of offers. Among the main venture capital funds operating in the Pomorskie region are: Aligo, Alfabeat, Black Pearls and Netrix Ventures.

According to the latest analysis of start-up activities in Poland (Start-up Poland, 2019) it is much easier to raise a €250k – €500k seed round today than 1-2 years ago thanks to PFR/PARP/NCBR instruments stimulating ecosystem with public funds. There are also programmes connecting start-ups with corporate partners, providing €50k non-equity grants, mentoring and help to get initial traction from enterprise customers. For the start-ups and scale-ups, meeting the criteria required can constitute a barrier for obtaining support from the financial instruments.

As pointed out by the authors of the OECD study (2019) the equity finance for start-ups and scale-ups is constrained, despite key policy initiatives such as the national Bridge Alpha Investment fund. Recently, the rules of the programmes have changed, and more specifically the investment ceiling for funds benefiting from this programme. Until now, they could invest in start-ups up to 3 million PLN (€683 million) and now this amount has been reduced to approximatively 1 million PLN (€227k).

Having said this, there is a room for improving the access to finance especially for start-ups and scale-ups. The access to external source of funding continues to be a barrier; however, the challenge is not only limited to increasing the overall funding. The

policymakers need to strive towards designing tailored policy instruments and maximising their effectiveness. This requires a better coordination between the national and regional level, which is a common and long-standing issue in Poland.

4.3. Culture

The lack of entrepreneurial culture is a structural challenge for all Polish regions. The Polish society is changing its attitude towards entrepreneurship, and it is also worthwhile noting that there has been a positive climate around entrepreneurship for a long time. According to the latest available polls (Global Entrepreneurship Monitor, 2018) every tenth Pole declares a willingness to start a business within the next 3 years, i.e., by 2020. This result is half that of 2016, when 21% of the population declared such plans. This decrease in the entrepreneurial intentions is influenced by the improvements observed in the labour market.

As noted in the application for the European Entrepreneurial Region Award, freedom, solidarity, equality, and openness, are often associated with Gdańsk and the inhabitants of the region are among the most entrepreneurial in Poland. The recent report by OECD (2019) found that the position of Pomorskie is strongest compared with the national average in terms of entrepreneurship culture. In particular, the Tri-City is considered as a thriving centre of entrepreneurship where many successful tech companies are based which is referred to as the 'start-up metropolises'. The presence of Scandinavian honest entrepreneurs also plays a positive role. The existing evidence also points to the fact that the alternative forms of fundraising as well as the merger and acquisition culture could be further developed.

5. POLICY-MIX FOR ENTREPRENEURSHIP

5.1. National framework for entrepreneurship support

The Operational Programme Smart Growth 2014-2020 (POIR) represented the second integrated set of support measures addressing the challenges of innovation and competitiveness of the Polish economy since the 1980s, following the implementation of the predecessor the Operational Programme Innovative Economy 2007-2013 (POIG). The OP SG encompassed a wide variety of instruments, covering multiple types of interventions such as support to applied research and development in enterprises, guarantees and equity investments, investments in R&D infrastructure in private enterprises and public research institutes, support for productive investments, improvement in the quality of public research and fostering collaboration between companies and research institutes. The aim of the programme was to support the on-going transition towards innovation-based economy.

The four main priorities of the programme were the following:

- Increasing the number and the quality of research and development projects carried out by enterprises;
- Improving the institutional conditions enabling enterprises to engage in R&D activities and enhancing their potential for R&D;
- Supporting innovation in enterprises, in particular by providing financial instruments for innovative investments and assisting innovative exporting companies from key sectors in further internationalisation; and
- Enhancing the links between public research, business, and the needs of the economy by investing in strategic public R&D infrastructure and research programmes with the highest potential for the Polish economy.

The total ERDF allocation during the period 2014-2020 accounted for €8.6 billion. The funding was used nationwide to strengthen research activities and improve the links between science and business in the sixteen Polish regions.

Launched in 2016 by the Ministry of Economic Development, the Start in Poland Programme⁵² is a package of instruments for innovative firms. Almost 3 billion PLN or €683 million from the **Start in Poland Programme**⁵³ will be invested in the development of start-ups in Poland. Firms will receive support not only in the incubation and acceleration phase, but also during further phases of development and international expansion. The objective of the Programme is to create an ecosystem for the development of start-ups in Poland, which will provide conditions for the growth of the number of start-ups and enterprises with high development potential.

The Polish Development Fund (PFR) supports and stimulates the development of young, innovative companies and future entrepreneurs through a number of instruments and the Polish Agency for Enterprise Development (PARP) is responsible for the acceleration support. Activities in the field of equity instruments (in which an external investor provides capital to a start-up) have been consolidated and are carried out by the Polish Development Fund (via PFR Ventures in the formula of a fund of funds). **Scale-Up Programme**⁵⁴ which is managed by PARP is run by 10 programme operators. Their task is to accelerate the development of Polish start-ups through e.g., leading to the stage of testing their solutions in large companies, and at the same time increasing the scale of their operations. Space3ac is an acceleration programme operating in Gdansk. It focuses on downstream space technologies using Earth observation, telecommunication, and satellite navigation data. The accelerator originated in 2016, following an agreement between the Commune of the City of Gdańsk, Pomeranian

⁵² See: <https://www.gov.pl/web/rozwoj/start-in-poland>

⁵³ See: <https://startup.pfr.pl/en/start-in-poland/#intro>

⁵⁴ See: <https://www.parp.gov.pl/component/grants/grants/scale-up>

Special Economic Zone (PSEZ), Black Pearls VC capital fund (BPVC) and Blue Dot Solutions (BDS).

Poland Prize⁵⁵ overseen by PARP is a programme inviting foreign start-ups to start activity in Poland. Its objective is to effectively include foreign economic operators in the Polish start-up ecosystem. The programme combines the idea of acceleration and soft landing for start-ups and puts a special emphasis on preparing foreign start-ups to operate in Poland and on their further development. In the Pomorskie, there are two initiatives implemented within the programme, notably by Starter of the GFP and Space3ac.

Bridge Alfa⁵⁶ is another programme aimed at ideas that are in the seed stage, where the risk of investment failure is the highest. NCBiR provides non-returnable co-financing up to 80% with a cap of 1 million PLN for an individual project through a network of the selected VC funds.

The POIR provided advisory and investment support, targeted at young people intending to establish a start-up business in the region. Meanwhile, the Regional Operational Programmes (ROPs) provided support for projects contributing to the development of start-up businesses, including investments connected with the development of business incubators and centres supporting academic entrepreneurship. Moreover, funding provided under ROPs focused on the creation of new or development of the existing economic growth infrastructure.

Actions in the scope of internationalisation, financed under the POIR were focused in particular on the implementation of new business models in SMEs. Meanwhile, business projects financed under the ROPs were targeted at increasing exports and gaining new outlets, directed to a wide group of potential beneficiaries (including those who are not involved in R&D&I activities).

According to the recent data the average Polish start-up in 2019 raised ca. 30% more funds in total than in 2017. An investor groups whose presence is growing the most quickly are VC funds supported by the recent national programmes managed by the NCBiR and the PFR (Start-up Poland, 2019). While there is a general consensus that the overall directions of support for start-ups and scale-ups are appropriate, important implementation challenges exist, such as changes in the national Bridge Alpha Investment fund.

5.2. Regional development policy

5.2.1. Regional governance arrangements

The Pomorskie Voivodeship Development Strategy 2020 has been based on the quadruple helix model in cooperation with stakeholders from the sectors of administration, business, academia, and NGOs.

At the executive level, the Steering Committee for the Development Strategy of the Pomorskie Voivodeship 2020 comprises of the management team members of six strategic programmes one of which is the 'Pomeranian Port of Creativity' Regional Strategic Programme for Economic Development. The Programme is expected to contribute to the growth of the region's competitiveness by providing support for the development of the economic sector and support for the science sector. It also plays a leading role in the implementation of the Development Strategy provisions related to the RIS3. The Pomeranian Entrepreneurship Council is a consultation and advisory body which provides a forum for discussions and consultations concerning the economic and social development of the whole region.

⁵⁵ See: <https://www.parp.gov.pl/component/site/site/en-poland-prize>

⁵⁶ See: <https://archiwum.ncbr.gov.pl/programy/programy-krajowe/bridge/bridge-alfa/>

At the implementation level, the Programme Manager, whose function is performed by the director of the Economic Development Department of the Marshal's Office, is responsible for the implementation of the Programme. The Programme Manager performs tasks with the support of the Programme Management Team which co-operates with the Programme Board, which has a consultative function and comprises of the representatives of regional higher education institutions, research institutions, business associations, business intermediary institutions, clusters, NGOs, and the public administration. The specific partnerships established within the regional areas of specialisation have a dedicated leading organisation.

The main business stakeholders are local enterprises, Pomerania Development Agency, Regional Pomeranian Chamber of Commerce, Pomerania Regional Development Agency, Pomeranian Chamber of Crafts. The main higher education institutions are the University of Gdańsk, Gdańsk University of Technology, Medical University of Gdańsk. NGOs comprises of Interizon - Pomeranian ICT Cluster, Pomeranian NGO Council, Economic Foundation in Gdynia, Research Institute for Market Economy.

5.2.2. Regional policy strategies and policy instruments supporting entrepreneurs and scale-ups

Both the recruitment and development of human resources and the investment in entrepreneurship (on which the 2020 Development Strategy for the Pomorskie Voivodeship is based) focus on attracting, developing, and retaining talents, nurturing start-ups, and supporting SMEs, as well as providing business education to young people.

The Pomorskie region supports each stage of the entrepreneurship development: from educating, boosting pro-entrepreneurship attitudes, assisting in the formation of new businesses to providing support for business development, increasing innovation potential of companies, and stimulating cooperation and expansion to new foreign markets. The Pomorskie region has managed to develop and put in place a comprehensive system of entrepreneurial support. While there are no apparent gaps that exist, it needs to be acknowledged that the support has been mainly concentrated on the existing companies.

The Pomorskie Voivodeship Development Strategy 2020 presents Pomorskie as a region of innovative economy, attractive for domestic entrepreneurs, external investors, tourists, scholars, researchers and students; economy that takes advantage of the region's unique characteristics, including its seaside location; economy based on creativity, cooperation networks and friendly business environment, where the R&D sector meets the needs of businesses; economy tapping into the international flow of information, knowledge and economic cooperation. The above objectives were defined in the 'Pomeranian Port of Creativity' Regional Strategic Programme for Economic Development⁵⁷ launched in 2013 and they focus on: promotion of innovation in business and transfer of knowledge to economy, concentration of resources supporting smart regional specialisation using clusters as a tool, strengthening of external links and connections of the regional economy, professionalisation of businesses and adaptation of education to the labour market requirements. On the other hand, the strategies are compatible, creating a cohesive regional policy for supporting and developing entrepreneurship.

As acknowledged in the Draft Development Strategy 2030 which is currently subject to public consultation strengthening international competitiveness is in the region's strategic interest as well as the innovativeness of local enterprises. Resilient economy is one the three strategic objectives. The desired changes defined in the Strategy include among others an increase in enterprises' adaptability to changes and productivity, strengthening cooperation between science, industry and the public administration, the

⁵⁷ See: <https://strategia.pomorskie.eu/rps-pomorski-port-kreatywnosci>

development of a comprehensive offer of business services and an offer for both the new and existing investors, in addition to the development of vocational training and competences in line with the needs of regional economy.

The recent joint European Entrepreneurial Region between the Pomorskie region and the city of Gdańsk focuses on the three following areas: 1) entrepreneurship in education, 2) support of start-ups (new innovative businesses), and 3) support and development of SMEs.

Both the region and the city strive to be a leader in setting trends in education, educating creative, brave, and independently thinking people by supporting the development of social and enterprise skills and competences and in creating an ecosystem for young people to support their growth and development, achievement of professional ambitions. The following two core activities will be realised in 2020 are related to the development of an entrepreneurship education ecosystem with the view of developing a comprehensive set of tools to support teachers in conducting entrepreneurship classes, career counselling and general education classes in schools at all levels of education as well as the development of a support system for business incubators addressed to students and young entrepreneurs. It is planned that the support system will give rise to the creation of new incubators and will provide support to the already existing ones to ensure continuous development of enterprising talents.

In the area of support to start-ups (new innovative businesses) the activities in 2020 will be concentrated on creating the environment conducive for the development of new businesses. For example, the Gdańsk Business Incubator 'STARTER', operated by the Gdańsk Entrepreneurial Foundation, will develop, and extend its operations. To support young companies from creative sectors, Creative Hub, an office space, will be made available to new entrepreneurs who will be offered a chance to rent space on preferential terms. Also, the region and the city recognise the potential in the area of social entrepreneurship. Actions will be also concentrated on activities related to the development of a migration policy model for start-ups, offering foreign start-ups a comprehensive support in their moving to Gdańsk and in launching their start-up business.

In the area of support for SMEs it is worthwhile mentioning the Invest in Pomerania (IiP), which is a unique initiative aiming to support foreign investors in executing investment projects in Pomorskie, including in Gdańsk. In its 2019 report on economy and entrepreneurship stimulation by local governments in Poland, the OECD stated that the Pomeranian system for attracting direct investments from abroad sets and example for the rest of Poland and that the activities conducted by Invest in Pomerania are a key factor driving the development of the region.

Building upon the experience in the course of the implementation of the JESSICA and JEREMIE initiatives during the period 2007-2013, the Pomorskie region provided within the Regional Operational Programme 2014-2020 the support for repayable financial instruments in the areas of entrepreneurship, revitalisation, and the power industry.

The Pomorskie Voivodeship has been also implementing a bottom-up process of defining smart specialisations. Business and academic groups organised into partnerships and interested in developing certain specialisations were invited to submit their suggestions as part of the Pomeranian Smart Specialisation Contest. This led to the selection of four platforms of specialisation, including maritime and logistics, ICT, green power engineering and medicine. Gdańsk is also where Space3ac, the first European acceleration programme for the space industry was created.

5.3. Experiences of interregional cooperation on entrepreneurship

With a view to sharing experiences, knowledge and good practices, the region participates in various international projects that are related to the development of the SME support policy.

The Pomorskie Regional Office in Brussels operates as part of the Pomerania in the European Union Association that comprises local governments, institutions of higher education, as well as representatives of business and civic society from the Pomorskie region.⁵⁸ The Office is also a member of the Baltic Sea Group, a cooperation platform for Baltic Sea representations based in Brussels. Some of the activities are carried out through European Regions Research and Innovation Network in Brussels (ERRIN) and involves the exchange of good practices in the field of support entrepreneurship with the EER laureates.

Important partners of the Pomorskie region are also other, non-Baltic regions, such as Limousin, Upper Normandy, Aquitaine (France), Middle Franconia (Germany), North Holland region, Newcastle, and Glasgow regions (Great Britain), and Valencia (Spain).

The ongoing interregional cooperation of the Pomorskie region takes mainly place with the support provided within the Interreg Programme as well as activities undertaken by the Pomorskie Regional Office in Brussels. During the 2014-2020 programming period, the Pomorskie region has been involved in some 75 interregional collaboration projects, the total value of which (EU funding) accounted for approximately €87.6 million. It also acted as a leader of some 36 projects. Comparatively, the involvement in this type of projects has been higher than in the Małopolska region, which has been involved in some 62 projects and acted as a leader in 27 projects.⁵⁹ So far, the cooperation within the other EU programmes (Horizon 2020, COSME) remains limited. This is not unique only to the Pomorskie region and a similar trend is observable in other Polish regions.

As shown in the table below, the Pomorskie region has participated in several cross-border cooperation projects.

The interests of the region span a wide range of topics which is not surprising given that its entrepreneurial ecosystem is constantly evolving. In particular, successful initiatives undertaken in other regions aimed at consolidating and developing the entrepreneurial ecosystem will be of particular interest in the light of preparation of the next generation of strategic programmes to be launched within the 2030 Regional Development Strategy.

Table 5 Overview of interregional cooperation experience

Funding scheme	Project name	Duration	Partner regions
Interreg Europe	The Everywhere International SMEs (EIS) project aims at promoting excellence in regional business support systems for internationalising SMEs by sharing and embedding best practices to enable more SMEs to expand their business across borders. ⁶⁰	Jan 2017 - Dec 2020	CR, DK, IE, IT, PT, UK
Interreg Europe	CLIPPER is an innovative interregional cooperation project that brings together seven regions to address the negative impact the global economic recession has had on Europe's maritime sector. ⁶¹	Jan 2017 - Jun 2021	CR, DE, ES, FI, FR, IT, UK
Interreg Europe	The Land-Sea project illustrates the joint efforts of partners from four European regions to promote an integrated approach towards	Jan 2017 - Dec 2021	BG, DE, ES, IT

⁵⁸ See: <https://pomorskieregion.eu/en>

⁵⁹ See: <https://keep.eu>

⁶⁰ See: <https://www.interregeurope.eu/eis>

⁶¹ See: <https://www.interregeurope.eu/clipper>

Funding scheme	Project name	Duration	Partner regions
	improving the policies for sustainable management of the land-sea ecosystems. ⁶²		
Interreg South Baltic	The INTERMARE project supports maritime economy across the South Baltic area through a network of companies and stakeholders brought together under a common brand of INTERMARE South Baltic. ⁶³	Jul 2017 - Jun 2020	DE, DK, LT, SE

Source: Author

⁶² See: <https://www.interregeurope.eu/land-sea>

⁶³ See: <http://intermare-southbaltic.eu/project>

6. IMPACT OF COVID-19 PANDEMICS ON THE REGIONAL ENTREPRENEURIAL ECOSYSTEM

6.1.1. Impact of COVID-19 pandemics on entrepreneurial activities

The recent pandemic has had a negative impact on the business economic activities in the Pomorskie region. As a consequence, there has been a drastic decrease observed in local government revenues. For example, in the municipality of Gdańsk the revenues of the former fell by roughly about 41% in comparison with the last year's data for April and decreased more than ten times during the first quarter of 2020 in comparison with the same period a year earlier which will have a significant decrease of local government revenues in the future. According to the latest available data (July 2020) the unemployment increased by 27.1% in comparison with the same period last year. The full extent of impact of pandemic on the regional entrepreneurial system is unknown but in the context of the current situation it is most likely there will be a decrease in entrepreneurial activity during the start-up and scale-up phase. The results of recent survey among entrepreneurs are more positive in Pomorskie than observed at the national level. This indicates that the region could be more resilient to external shocks and crisis; however, there are no reasons for optimism due to the possibility of economic downturn.

6.1.2. Impact of COVID-19 on entrepreneurial activities at sectoral level

6.1.2.1. Impact on ecosystems that have benefitted from COVID-19

As shown in the latest poll among entrepreneurs, the ICT sector recorded very good sentiment with the increase of 38.6 points which is the highest since the end of 2018. Some industries appear also to be more resistant to the crisis, especially the accommodation and catering where a positive difference of 38.5 points is recorded in relation to the rest of the country. Pomeranian seaports are also doing relatively well during the pandemic. In the first half of 2020, the Port of Gdańsk handled 23.2 million tonnes, which is a decrease of 15.2% compared to the same period in 2019. However, despite the impact of the global crisis and the ongoing pandemic, the Port of Gdańsk advanced to the top twenty European ports, ahead of the Port of Genoa and Dunkirk, and is still fourth in the Baltic Sea. The Port of Gdynia recorded a slight increase in shipments during the period in question.

Examples of companies in the Pomorskie region that used the crisis caused by the pandemic for the development of new business opportunities include the following:

- online shopping by Desmart Gdańsk – service allowing to order groceries from a given store, picking them up or ordering delivery without leaving home;
- BrainScan.ai – the application of artificial intelligence in radiology - computed tomography image readings, on which radiologists diagnose changes in the lungs caused by the course of the disease; and
- Upsteam - booking mobile home car washes on a specified date).

6.1.2.2. Impact on ecosystems that suffered from diminished demand because of recession

The latest available polling results of sentiments among the entrepreneurs, in six out of seven sectors negative sentiments were identified. Transport and warehouse management recorded a decrease of 54.9 points which is the lowest result recorded since 2001 and mainly a consequence of slowdown in sea transport with China. The construction sector reported a decrease of 32.1 points which is the worst result since mid-2013, followed by the retail sales which recorded a downward trend of 29.2 points representing the biggest decline since January 2008. Contrary to the decline in energy decline in other parts of Europe affected by the closure of large manufacturing companies, there is no significant change recorded in the Pomorskie region.

6.1.2.3. *Impact on ecosystems hard hit by the crisis*

Small enterprises suffered the fastest from the crisis and recorded a sharp increase in applications for suspension of operations, reaching the level of approximately 9,000 by the end of March 2020. Another observable trend is the reduction of operation costs by large enterprises. For example, the LPP – the biggest Polish clothes manufacturing company in Central and Eastern Europe foresees the reduction of commercial space by 30%, while Scania recorded a decrease in the production by 25 and plans the reduction of 5% of the crew (44 layoffs). During the interviews carried out in the framework of this assignment, it was also noted that the leisure industry has been particularly affected by the COVID-19. In response to the situation, a call dedicated for this specific branch was launched by the regional authorities with the total budget of 30 million PLN, which has been popular and attracted a lot of interest among the potential beneficiaries.

6.1.3. *Policy responses*

The financial support provided to companies in the Pomorskie region accounted for 1.55 billion PLN or €352.9 million. This includes the support of approximately 1 billion PLN or €341.5 million provided for co-financing the costs of business operations, parts of the salary costs, loans for micro-enterprises from the Labour Fund as part of local and regional labour offices. Due to the increasingly difficult financial conditions of business enterprises, additional support of 50 million PLN or €11.3 million was allocated from the from the Regional Operational Programme of the Voivodeship of Pomorskie 2014-2020 to the Pomorskie Loan Fund increasing the capitalisation of the Fund from 35 million to 85 million PLN (i.e., €7.9 -€19.3 million). The total support provided in the form of financial instruments, including Pomeranian Development Fund (PFR), Pomeranian Loan Fund (PFP), and Pomeranian Regional Guarantee Funds (PRFPK) accounted for approximately 541 million PLN or €123.1 million. Additionally, the Labour Office of the Voivodeship of Pomorskie co-financed the costs related to the decrease in the working time within the Fund of Guaranteed Employee Benefits (FGŚP) for the total amount of 461 million PLN or €104.9 million. Since the outbreak of the pandemic, the Voivodeship of Pomorskie is engaged in support and mainly uses to this end the financial resources allocated within the Regional Operational Programme 2014-2020. The total financial support accounts for 373 million PLN or €84.9 million. Moreover, the support is provided for the financial redemption in the capacity of local self-governance institutions. The special dedicated web platforms were developed by the city of Gdańsk⁶⁴, Sopot⁶⁵, Gdynia⁶⁶, Slupsk⁶⁷, and Pelplin⁶⁸.

7. ASSESSMENT OF THE ENTREPRENEURIAL ECOSYSTEM

7.1.1. *Assessment of challenges faced by entrepreneurs*

The SME sector constitutes the vast majority of enterprises in the Pomorskie region (99.8%), and micro-enterprises are the most numerous group (96.9%). One of the challenges lying ahead of entrepreneurs in the Pomorskie region is related to the adaptability to external changes taking place on the markets. The companies often lack specialised expertise and know-how in scaling-up their operations, especially smaller companies which do not have sufficient time and resources. Companies require competences different from those offered by the traditional education system. In

⁶⁴ See: <https://www.Gdańsk.pl/wiadomosci/ulgi-czynsze-pozyczka-mikropozyczka-pakiet-wsparcia-Gdańsk-umorzenie-koronawirus-epidemia,a,168623>

⁶⁵ See: <https://www.sopot.pl/aktualnosc/8134/pakiet-wsparcia-dla-sopockich-przedsiębiorców-i-organizacji-pozarządowych>

⁶⁶ See: <https://www.gdyniaprzedsiębiorcza.pl/pl>

⁶⁷ See: <https://biznes.slupsk.pl/pl>

⁶⁸ See: <http://pelplin.pl/wiadomosci/8496/gmina-pelplin-wprowadza-pakiet-pomocowy-dla-przedsiębiorców-w-zw>

particular, the attention will need to be paid to developing competences that are common to certain professional groups. It is also worth mentioning that despite an observable increase in the share of R&D expenditure in innovation investments in the manufacturing sector, the regional industrial base relies to a great extent on technologies developed outside the region. Said this, the potential threat is related to the so-called 'middle income trap' which means the exhaustion of existing competitive advantages and the loss of possibilities for launching activities in the new growth areas.

Attracting and retaining talents has become increasingly challenging over the past few years. This is certainly an important aspect for consideration which could be tackled through interregional cooperation and could actually offer an opportunity of strengthening the human capital assets in the region.

7.1.2. Challenges faced by SMEs and large companies

Concerning R&I activities, the main challenge stems from the reluctance to establishing the cooperation among companies themselves as well as with the involvement of science and HEIs institutions. Without joint efforts, it is impossible to ensure the necessary critical mass for the business undertakings and R&I activities.

As noted in the previous research (OECD, 2019) in the 2007-2013 EU programming period, the Pomorskie regional government adopted a Regional Programme for Cluster Policy Support 2009-15. Although the majority of their public funding was stopped in the new EU programming period 2014-2020, the cluster organisations and networks have continued to function, facilitating collaboration and knowledge exchange among research, business, and government in the region. The RIS3 areas were selected based on the principle of utilising the region's unique assets to develop its distinct comparative advantages. Currently, the Pomorskie region is carrying out an initiative the objective of which is to increase the activity of entities from the Smart Specialisation of Pomorskie.

The interregional cooperation in the light of a new Interregional Innovation Investment initiative (I3) proposed by the Commission and other EU programmes appears to be relevant for Pomorskie and could be of interest among other regions participating in the EER initiative. Engaging large enterprises and SMEs in the development of regional entrepreneurial ecosystem could be also tackled through interregional cooperation.

7.1.3. Challenges related to market services and ecosystem builders

The Pomorskie region is unique in terms of providing the stability in terms of strategic direction. The efforts are concentrated on developing new models and building the ecosystem around the existing institutions. However, the support is dispersed among a large number of entities. Said this, there is a continuous need for ensuring a better coordination of activities among the different institutions. The Self-Government of the Voivodeship has certainly an important role to play as a catalyser of the entrepreneurial ecosystem.

The exchanges of inspiring practices from other regions and sharing examples of consolidating the regional entrepreneurial ecosystem would be of relevance for interregional cooperation.

7.1.4. Challenges related to the R&I system

Universities and research centers provide knowledge in technologies that enable the start-up; however, the existing mechanisms aimed at fostering the development of entrepreneurship at universities remain sub-optimal. The HEIs and research centers also do not sufficiently collaborate with entrepreneurs in the technology transfer process.

In relation to the human capital assets, improving curricular activities for entrepreneurship in HEIs could be also tackled through interregional collaboration.

7.1.5. Challenges related to framework conditions

7.1.5.1. Access to finance

In comparison with the other advanced European regions, the size of the financial instruments and in relation to the regional needs is limited. However, the challenge is not limited exclusively to the level of available funding. The companies might have technologies but because of the existing limits in the existing public interventions they lack the financial means for specialised activities for later and growth stage. The seed funding mechanisms could be further developed and tailored to the specific needs of technology-start-ups. Concerning the succession planning and business transfer, the commercial banks are not willing to provide loans to new entrepreneurs for the acquisition of the existing businesses which has been identified by the regional authorities as a gap in the current portfolio of instruments.

Said this, developing a new instrument targeted at companies with the growth potential, start-ups, in addition to new forms of support for the acquisition of the existing businesses could be the areas of interest for interregional cooperation.

7.1.5.2. Human capital

Considering a decreasing number of students, the challenge for the Pomorskie region consists of attracting talents from other parts of the country and from abroad as well as retaining them. The pace that the companies are developing is faster and there is a certain difficulty for HEIs to adapt their educational programmes. Launched in 2017, the Industrial PhD Programme by the Ministry of Science and Higher Education provides the possibility of educating a participant of doctoral studies in cooperation with the entrepreneur (or other entity) employing him.

In addition to attracting and retaining talents as well as improving curricular activities for entrepreneurship in HEIs mentioned above, the creation of the regional platform of scholarships and trainings could lend to be a subject of co-operation with other EER regions.

7.1.6. Assessment of the regional policies for entrepreneurship

The regional policies for entrepreneurship have been mainly targeted at the existing companies and investors and too much lesser extent at start-ups and scale-ups. This offers opportunities for developing new actions through interregional cooperation, while ensuring that they are tailored to the local context and aligned with the existing legal framework.

8. REGIONAL SWOT AND CONCLUSIONS

8.1.1. Maturity of the regional ecosystem

The performance and recent trends in start-up, annual birth of start-ups, scale-up activities, successes and presence of business angels and VC indicate that the entrepreneurial ecosystems of Pomorskie is rapidly developing. There is also number of interesting recent developments taking place which are indications of the maturity of the ecosystem, including the acceleration programme Space3ac, Digital Innovation Hub - DIH4.AI focused on artificial intelligence, robotics, Internet of Things, and cybersecurity, in addition to activities of the Incubator Starter, Invest in Pomerania, and the CWTT to name a few. Developing and consolidating the entrepreneurial ecosystem especially in these thematic areas in cooperation with the other EER regions would be of particular relevance for the Pomorskie region.

As shown in the table below the maturity of entrepreneurial ecosystem in Pomorskie is evolving both in terms of market forces and policy interventions.

Table 6 Maturity level of the Pomorskie entrepreneurial ecosystem

Stage of EE	Nascent	Evolving	Mature	Sustainable
Does the system rely more on?				
Market-forces		X		
Policy interventions		X		

Source: Author

Altogether there are some 150 start-ups operating in the Pomorskie region. It needs to be acknowledged; however, that there are fewer start-up companies which developed their own technologies and/or obtained external funding from the VC funds and banks. The interview results also indicate that there are several dozen start-ups established each year. Events are visible and the Infoshare conference in particular contribute to developing a community of entrepreneurs and innovators.

There is a large number of entities involved in the regional entrepreneurial ecosystem; however, there is a general lack of service providers for start-ups and scale-ups from the private sector. In the current situation, considerable investments are necessary to further professionalise activities undertaken by the intermediary institutions and develop a demand-based model for SMEs support services. The links of HEIs and research centres with the remaining actors of the entrepreneurship ecosystem remain underdeveloped and streamlining the support for the development of entrepreneurship at universities is only at early planning stage. The local and regional authorities play an active role in the development of the entrepreneurial ecosystem. The public sector intermediaries' support has been mainly targeted at the existing companies and investors and much lesser extent at start-ups and scale-ups. For the time being, there is no systematic renewal of new companies, scale-ups and M&As, and IPOs identified.

Based on the existing evidence and data, it can be concluded that the entrepreneurial ecosystem of the Pomorskie region already passed the nascent stage and has all the characteristic of the evolving ecosystem.

8.1.2. Impact of the COVID-19 pandemics

The recent pandemic has had a negative impact on the business economic activities in the Pomorskie region and consequently on local government revenues. Small enterprises suffered the fastest from the crisis and large enterprises also started to reducing the costs. The ICT sector has managed relatively well during the pandemic. On the other hand, the leisure industry has been particularly affected by the COVID-19. The Infoshare which is the largest technology conference in Central and Eastern Europe had to quickly adapt changing the format of event to online. There has been an important policy response provided to enterprises in order to mitigate the effects caused by the pandemic.

8.1.3. Updated regional SWOT as basis for interregional collaborations

Based on the conclusions from the previous sections, the table below presents strengths, weaknesses, opportunities, and threats.

Table 7 SWOT of the region of Pomorskie

Strengths	Weaknesses
<ul style="list-style-type: none"> • The Tri-City is considered as a thriving centre of entrepreneurship • A large number of entities involved in entrepreneurial ecosystem • A portfolio of portfolio of large corporations in the Pomorskie region • A strong track record and achievements in providing support for development of entrepreneurship • Relevance of a number of initiatives implemented in the region • Stability in decision-making and strategic directions • The regional authorities playing a catalyst role • Scientific and research potential (presence of scientific and research institution) • Well-developed research and business support infrastructure 	<ul style="list-style-type: none"> • Low level of involvement of HEIs and scientific institutions in the development of entrepreneurial ecosystem • Lack of services providers for start-ups and scale-ups from the private sector • Lack of support for development of entrepreneurship competence (entrepreneurship curriculum) in HEIs • Mismatch between supply for IT talents and demand driven by large companies • Unsatisfactory level of key competences among students and graduates • Lack of the merger and acquisition culture • Lack of access to external sources of funding especially for companies with the growth potential • Insufficient internationalisation among the stakeholders of the entrepreneurial ecosystem
Opportunities	Threats
<ul style="list-style-type: none"> • Improving access to knowledge / specialised services • Engaging large enterprises and SMEs • Building upon the established collaboration with clusters • Ensuring a better coordination of activities among the different institutions 	<ul style="list-style-type: none"> • Public support mainly targeted at the existing companies and investors • Centralisation of support for start-up and scale-ups • Falling number of students at HEIs • Lack of representative voice from the business sector

<ul style="list-style-type: none">• Improving curricula activities for entrepreneurship in HEIs• Attracting and retaining talents• Developing a new instrument targeted at companies with the growth potential and new forms of support for the acquisition of the existing businesses• Consolidating the entrepreneurial ecosystem in areas with a clearly defined thematic focus	<ul style="list-style-type: none">• Relying on the public sector intermediaries' support• Impact of COVID-19 on entrepreneurial activities
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APPENDIX II LIST OF INTERVIEWEES

Table 8 Overview of interviewees

Name	Organisation	Date of interview
Piotr Ciechowicz	Pomerania Development Agency (ARP)	24 September 2020
Damian Kuźniewski	Gdańsk University of Technology, Centre for Knowledge and Technology Transfer (CWITT)	28 September 2020
Tomasz Szymczak	Gdańsk Entrepreneurial Foundation (GFP)	29 September 2020
Grzegorz Borowski	InfoShare	6 October 2020
Przemysław Sola	Pomeranian Regional Chamber of Commerce (RIGP)	6 October 2020

APPENDIX III METHODOLOGICAL NOTE ON CRUNCHBASE AND DEALROOM BASED ANALYSIS

Primary data on venture capital and private equity investment in innovative start-ups and firms have been sourced from Crunchbase and Dealroom databases. Both databases consist of a sample of innovative, investment-backed technology active companies in the EU27 and competing economies such as the US.

With the objective to have a more robust sample and better data coverage for the EU27, the datasets of Crunchbase and Dealroom have been merged, notably the information on venture-backed tech companies, their average total and last investment, year of foundation, type of investment and activity and industry description. Crunchbase data was matched with Dealroom data, using the names of the companies as a common identifier. The companies' names do not indicate any differences in Crunchbase and Dealroom, but additional cleaning of the data was necessary. Duplicate companies were removed from the sample.

Crunchbase is a widely trusted source of information on venture capital backed innovative companies. Dealroom is a provider of similar type of information in Europe having a better coverage about tech start-ups and scaleups in the EU27. Crunchbase information includes investments and funding information, founding members and individuals in leadership positions, mergers and acquisitions, news, and industry trends. Originally built to track start-ups, the Crunchbase website contains information on public and private companies on a global scale. Crunchbase sources its data in four ways: through a venture programme, machine learning, an in-house data team and the Crunchbase community. Members of the public can submit information to the Crunchbase database. These submissions are subject to registration, social validation and are often reviewed by a moderator before being accepted for publication.

Dealroom is an online-based platform that provides business information about innovative organisations and their investment stages from seed-stage to late growth-stage. It enables investors to track companies' progress and decide the appropriate time to invest in them. Nevertheless, it is increasingly used in studies for economic research as well. It is particularly used as a source of information on start-up activity and financing within and across countries as well as regions. It covers 77% of information in comparison with the official statistical evidence. In comparison with Crunchbase data source, the Dealroom platform covers 30% more organisations for EU countries. The relevant information for this study that are included in the database are listed in the table below.

Crunchbase has been explored by several scholars including the OECD to reflect about innovative start-ups and venture capital investment. Although the coverage of Crunchbase varies across countries and technology-oriented sectors are much better covered, it is one of the most popular databases to analyse entrepreneurial behavior. Since Crunchbase is more and more recognised as a primary data source for investors, entrepreneurs have an incentive to register on the website (Breschi et al., 2018). It is based on a crowd-sourcing process, where registered users can complement and revise information not just on their own profiles but suggest further information to be included on other profiles too. Following Breschi (2018), comparisons with other sources suggest that the coverage of Crunchbase is quite comprehensive for start-ups. When comparing the coverage of Crunchbase to the OECD Entrepreneurship Financing Database, the results show similarity across the two data sources. The share of investments accounted for the United States appear comparable across the two sources (Dalle et al. 2017).

In order to analyse firms and start-ups involved in the development or active deployment of advanced technologies, we relied on the regional and industry categorisation of Crunchbase and tagging system of Dealroom.

For our analysis, start-ups have been defined as companies established after 2015. Scaleups have been defined as companies that received a private equity or VC investment since 2010 more than €100 000.

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