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FOUNDATION will provide a framework and roadmap for regions facing industrial closures, job losses and uncertainty, to develop economic resilience through collaboration.

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## LITHUANIAN REGIONAL ANALYSIS

BUILDING REGIONAL RESILIENCE TO INDUSTRIAL STRUCTURAL CHANGE

**Panevezys Region - Lithuania**

### Lithuanian Partner

Project Partner: Lithuanian Innovation Centre



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## INTRODUCTION

FOUNDATION is an Interreg Europe funded SME Competitiveness project that brings together nine partners in a consortium led by Cork Institute of Technology from 1/08/2019 to 31/07/2023. Presently, across Europe, public bodies are pressed by an increasing need to provide preparatory support to the economic ecosystem in advance of the closure of anchor firms in their region which act as significant employers. The impacts of a closure of course go beyond direct employees and ripple, wave like throughout the regional services sector and economy. Management of such anticipated structural change requires proactive renewal of business approaches and policy supports. Regions are encouraged to introduce pilot projects based on their own strengths and to provide appropriate business supports for the re-alignment of the regional industrial base. This proactive approach by regional stakeholders is critical to building the resilience of these regions and enabling them to adapt to change.

The importance of SMEs and start-ups to the regional economy is widely recognised in terms of the provision of employment, contribution to GDP, driving innovation and supporting regional resilience. It is imperative that the relevant regional stakeholders keep informed, inspired and equipped to provide the appropriate SME and start-up supports, particularly in regions anticipating structural change.

FOUNDATION links its project partners to develop Regional Action Plans and an overall Framework and Roadmap for Anticipated Structural Change. It is imperative that industry players, business support organisations and policy makers understand how their ecosystems work and when faced with shocks (firm closures) to collaboratively develop alternative growth and employment through supportive policies and programmes to boost SME competitiveness. Key project activities included the exchange of experience and learning through interregional events (4 workshops, 4 seminars and 9 study visits).

## FOUNDATION PROJECT PARTNERS



## LITHUANIA - PANEVEZYS COUNTY

The [Lithuanian Innovation Centre](#) is the Lithuanian partner representing the Sostines and Vidurio ir Vakarų Lietuvos regions.

**County:** Panevezys

**Administrative centre:** Panevezys

**Size:** 7,878 sq. km<sup>2</sup>

**Population:** 211,190

**GDP:** 11,8 thousands per capita (2018)

**% of Unemployment:** 8.6% (2020)



The Panevezys County is comprised of 6 districts (6 Local Authorities with Panevezys City Council), that involves 11 cities. It covers 7,878 sq. km representing 12% of the landmass of the country. The Region's main urban centres are the cities of Panevezys, Kupiskis, Rokiskis, Biržai, Pasvalys. With an average population density of 27 persons per sq. km it is predominantly a rural region.

A number of Universities, Institutes of Technology and research centres, both private and public, help drive and support the innovation potential of the region. Each school in Panevezys has a robotics club, as all the municipalities of the Panevezys region have agreed on the strategic direction of Industry 4.0 for the region. Panevezys is known to have the largest concentration of Norwegian investors. Here you can find the Norwegian Scan Investment industrial park, which was established by the Norwegian government. The park has been attracting furniture producers from Norway since 2000, culminating in the establishment of a complete chain of furniture producers from all over the world.

### Labour Pool

Labour pool	98 600
Employees in manufacturing	24 000
Unemployment rate	8.6%
Average labour costs	1137€



Resident population  
at the beginning of 2020  
**211,189**



Area  
at the beginning of 2020  
**7,878 km<sup>2</sup>**



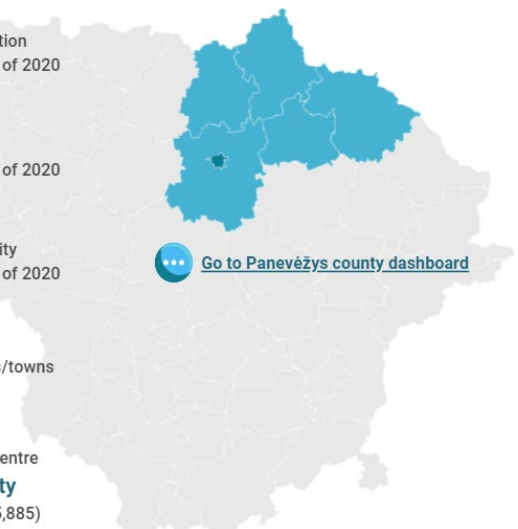
Population density  
at the beginning of 2020  
**26.8 per 1 km<sup>2</sup>**



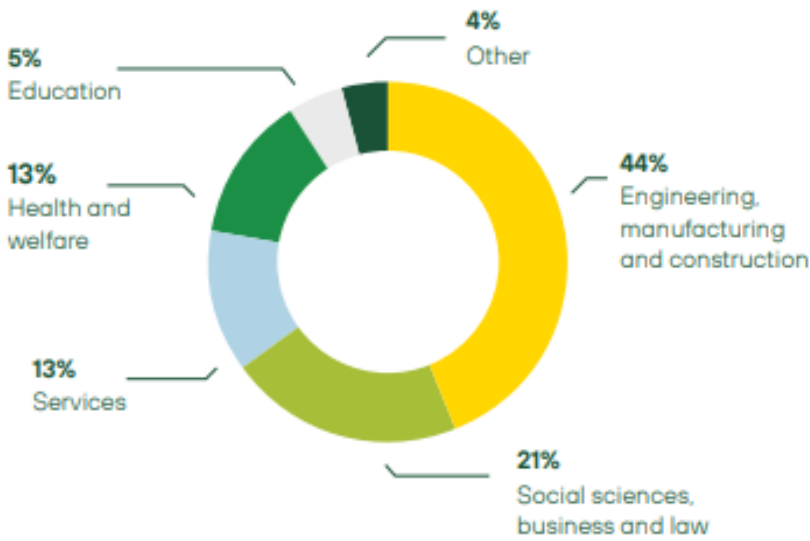
Number of cities/towns  
**11**



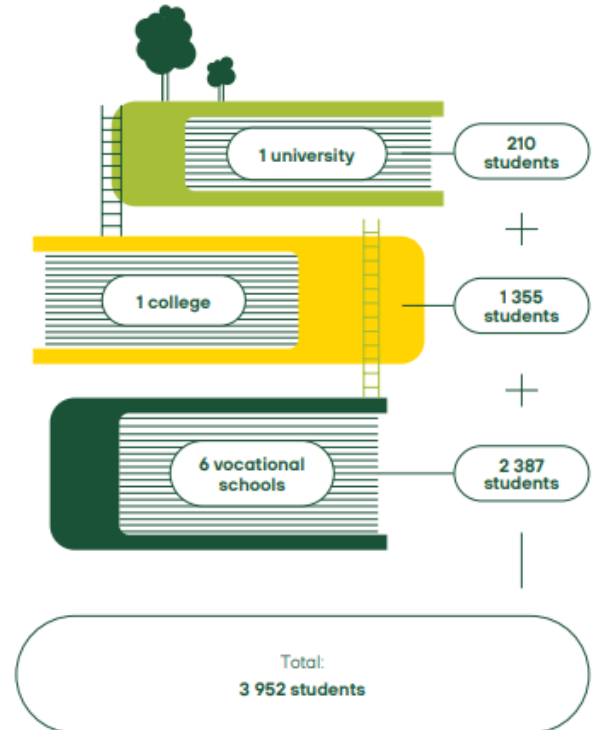
Administrative centre  
**Panevėžys city**  
(Population – 85,885)



## Fields of Study

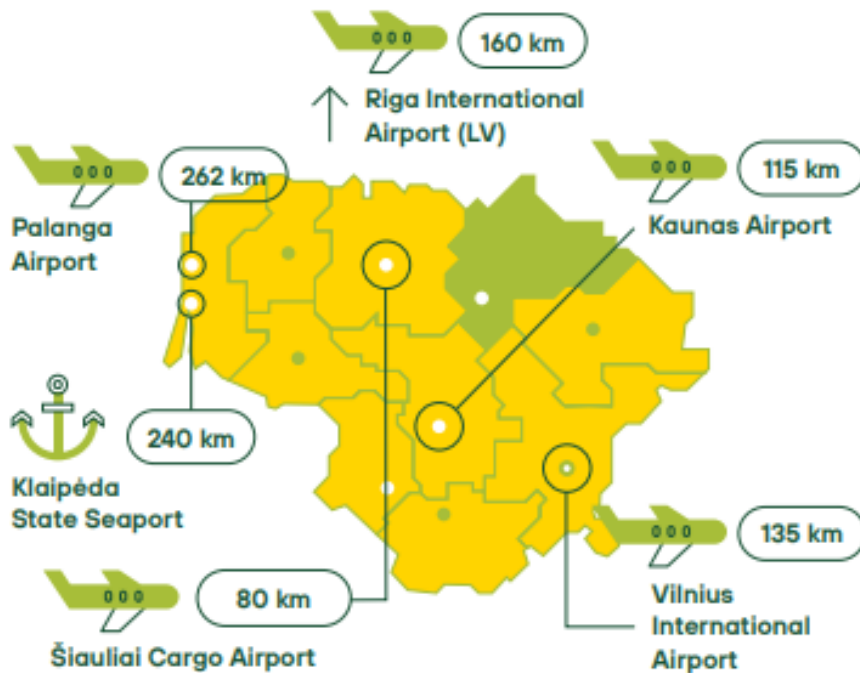


## Education



## Infrastructure

### Connectivity



Manufacturing is one of the key factors of economic growth in the region of Panevėžys. On the national level, the manufacturing sector has played a key part in dynamic growth of Lithuanian export and is critically important to the Lithuanian economy. With its history as the largest color TV screen and compressor producer in the Baltics, Panevėžys is well known as the centre for the engineering competencies. Today about one third of the GDP produced in the region is generated in the manufacturing sector and almost 600 manufacturing companies are responsible for employing a quarter of area's population. Most of the production is exported, which makes it crucial for the companies to increase competitiveness in the global market and produce high value added products.

Among the companies are strong manufacturers of automotive components, electronic equipment, food products, packaging and furniture, metal and plastic processors. The majority of the companies within a region are small and medium-sized enterprises. The country's extractive industry and manufacturing are multiform; there are industries that are characteristic to certain municipalities: in Birzai district municipality – manufacture of meat and meat products, as well particular brands of beer; in Kupiskis district (4 %) – peat mining and manufacture of wood products; Panevezys town (54 %) – manufacture of flour, starch, beer and malt, insulated wires and cables, isothermal bodywork and trailers; Panevezys district (7 %) – meat and meat products, compound feedingstuff; Pasvalys district (10 %) – high-fat cheese; Rokiskis district municipality (19 %) – milk and dairy products, freight transport assembly. More than half (57.2 %) of total industrial production was that produced by enterprises manufacturing food products and beverages. In food industry, the most rapid growth was observed for milk, beer, meat and grain production. In 2007, exports of production manufactured in the county made up about 58.6 %

In order to ensure a sustainable and geographically balanced economic growth throughout Lithuania, all Lithuanian regions are encouraged to choose their strategic specialisation for their economic growth. After evaluating the internal resources and the potential for their use, Robotics and automation have been identified as one of the main areas of economic development in the region of Panevezys. Following the defined direction, at the beginning of 2018, the Panevezys City Municipality signed a cooperation agreement on development of robotics with 14 institutions. It was agreed to become one of the strongest centres of robotics in the region of North East Europe through the continuous support aimed at fostering the progressive development of business growth and scientific activities.

The region of Panevezys has a high potential for the development of Industry 4.0. First of all, the region of Panevezys can offer the engineering knowledge and experience. Secondly, there is a large number of companies in the region that express the interest in the adoption of new technologies, automation and digitization solutions. Finally, the successful development of Robotics and automation specialisation in Panevezys has a direct positive impact on the development of other directions of economic growth in the region.

## ECONOMIC RESILIENCE ACROSS EUROPE

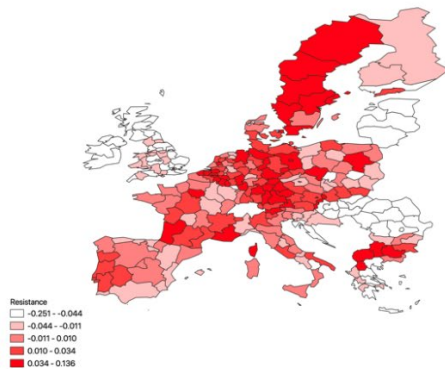
The 2007/8 economic crisis was the most severe shock to global financial markets since the great depression in the 1930s (Bordo and Landon-Lane, 2010; Barranco and Sudrià, 2012). Following the crisis there was a re-emergence of interest in how regional economies respond to and recover from economic shocks (Martin, 2012; Fingleton, Garretsen and Martin, 2012; Martin and Sunley, 2015; Doran and Fingleton, 2016). The term resilience in economic geography refers to the ability of a region 'to anticipate, prepare for, respond to and recover from a disturbance' (Foster, 2007, p.14). There are three main conceptualisations of resilience; engineering, ecological, and evolutionary. Engineering resilience is an equilibrium based notion of how an entity or system is plunged into disequilibrium, and off its steady state, following a shock and can be defined 'how fast the variables return towards their equilibrium following a perturbation' (Pimm 1984, p.322). The concept of ecological resilience can be defined as the 'the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist' (Holling 1973, p.41). The region may settle on an inferior path post-shock or recover and assume a superior path post-shock.

However, these two forms of resilience have been criticised as too limiting and evolutionary resilience has gained significant focus in recent years. Martin and Sunley (2015) introduced such a conceptualisation of resilience defining it as a changing process that is adaptive. The adaptive capacities are based on the ability of the region to resist, reorientation, and recover following shocks. Martin and Sunley (2015, p.13) defined 'adaptive resilience' as 'the capacity of a regional or local economy to withstand or recover from market, competitive and environmental shocks to its developmental growth path, if necessary, by undergoing adaptive changes to its economic structures and its social and institutional arrangements, so as to maintain or restore its previous developmental path, or transit to a new sustainable path characterized by a fuller and more productive use of its physical, human and environmental resources'.

There are four broad ways of measuring resilience; (i) case studies, (ii) indices of particular regions in a descriptive discussion, (iii) Time series analysis focusing on the evolution over time, (iv) causal economic models. In this overview of regional resilience, it is the final approach, causal economic models, which is employed. The conceptualization of Martin and Sunley (2015, p.13) and Martin et al (2016) is employed to assess the resistance and recovery of regions following the 2007/08 economic crisis.

In Figure 1 the left hand side shows the resistance to the 2008 economic crisis while the right hand side shows the recovery following the 2008 economic crisis. In both instances the darker red colour shows that that region performed relatively better than the European average at resisting the shock (in the left figure) or recovering from the impact of the shock (in the right figure).

## Resistance



## Recovery

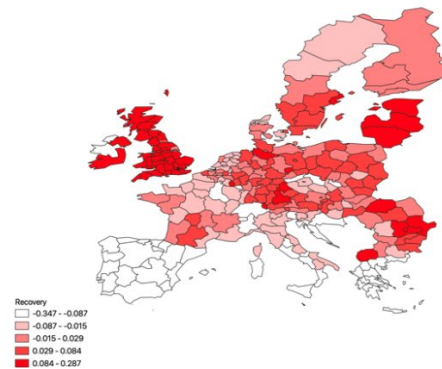
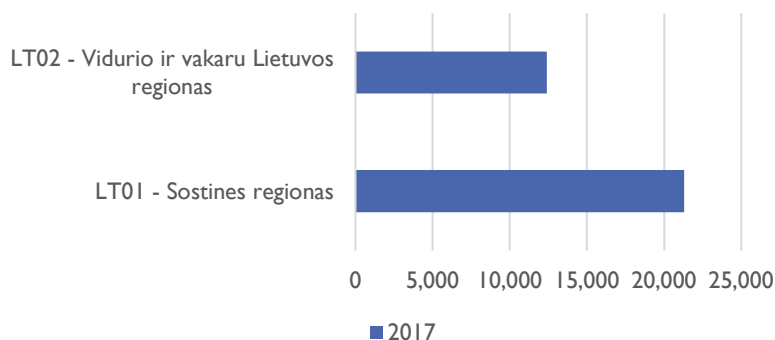


Figure 1: The resistance and recovery of European Regions to the 2008 economic crisis

## LITHUANIA – NUTS2 VILNIUS

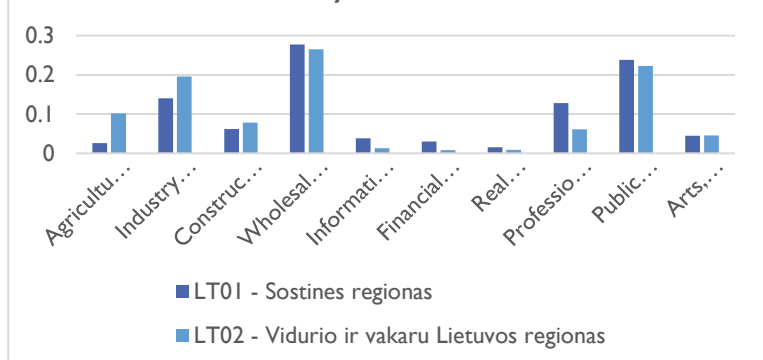
Figure 2 - GDP per capita in 2017



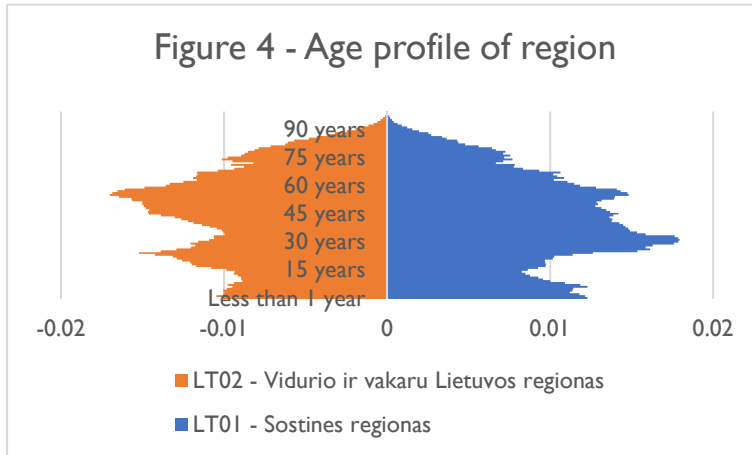
The GDP per capita in 2017 of the two regions of Lithuania are displayed in Figure 2. A significant regional divide is evident with the Sostines regionas possessing a significantly higher level of GDP per capita.

The proportion of the workforce employed across sectors varies across the two regions. The Sostines regionas possess less employment (as a proportion) in the agricultural, forestry and fishery sector relative to the Vidurio region. But it possesses a higher proportion of employment in the professional services and public administration sector.

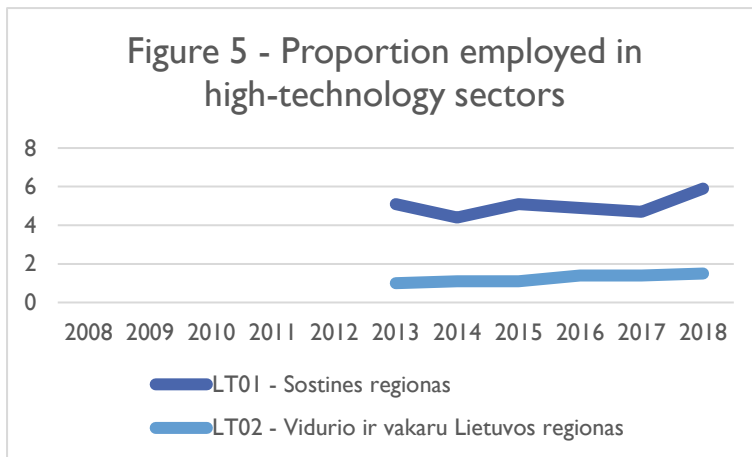
Figure 3 - Proportion of employment by sector







The age profile of the two regions differs significantly, The Sostines regionas has a significantly younger regional profile relative to the Vidurio region. The Vidurio region has a spike in its age profile around the 50 year old mark suggesting an aging population demographic.



Regarding the engagement of the region in high-technology employment data is only available regionally from 2013, Figure 5 compares the two regions over this time period. The Sostines regionas has a significantly higher proportion of employment in high technology sectors.

Table 1 below presents a brief comparison of the regions participating in this project. Significant variations can be observed across the regions with the Southern region of Ireland standing out with an exceptionally high level of GDP per capita and high-tech employment. While the Podkarpackie region of Poland has the lowest level of GDP per capita while the Vidurio ir vakaru Lietuvos regionas of Lithuania has the lowest level of high-tech employment as a proportion of employment.

Table 1: Comparison of Study Regions

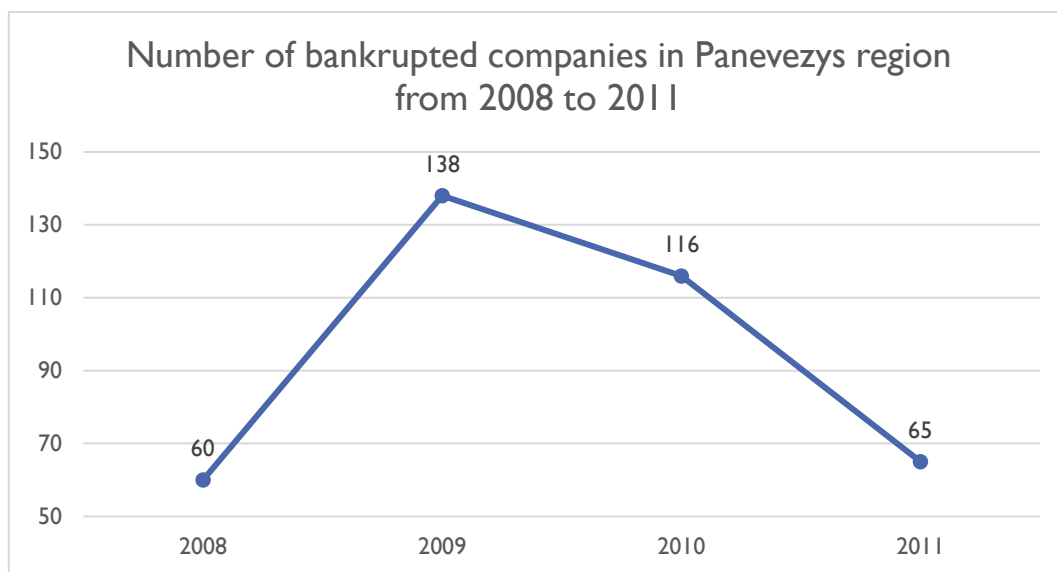
Region	GDP - 2017	High Tech Emp % - 2018
FI1D - Pohjois- ja Itä-Suomi	33,800	4.10%
UKD3 - Greater Manchester	30,500	5.00%
IE05 – Southern Region	74,700	7.40%
LT02 - Vidurio ir vakaru Lietuvos regionas	12,400	1.50%
PL82 - Podkarpackie	8,500	2.10%
HU22 - Nyugat-Dunántúl	13,400	3.90%

AT31 - Oberösterreich	43,100	3.00%
ITC2 - Valle d'Aosta/Vallée d'Aoste	35,200	3.30%
ES62 - Región de Murcia	20,600	1.60%

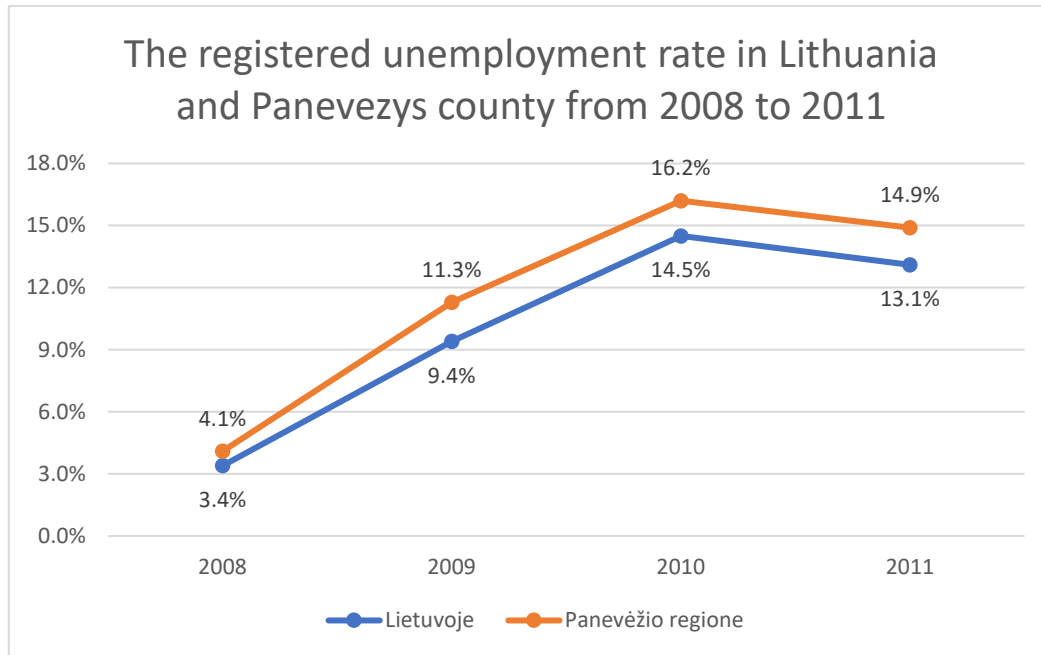
## INDUSTRIAL RESTRUCTURING IN PANEVEZYS REGION

The study made in Panevezys country provides a more detailed overview of the impact of 3 structural shocks (financial crisis, Russian embargo and technological advancement) on the manufacturing sector of Panevezys country which is part of the Vidurio ir vakaru Lietuvos region (NUTS2).

The impact of the financial crisis (2008 – 2010) had a significant impact on business performance, labour, production and financial performance, as well as on the overall industrial development and competitiveness of the region. The increase in the number of bankruptcies and group redundancies in manufacturing companies have led to emigration processes.



The worsening financial performance of regional companies led to both an overall decline in the potential workforce and rising unemployment. During the period of 2008-2010 the decline of more than 7,000 potential workforce was recorded in the region. In 2008 Unemployment rate of 4.1% was registered in Panevezys region, while in 2009 it almost tripled to 11.3% and in 2010 the unemployment rate reached 16.2%. One-fifth of those people were long-term unemployed (looking for work for 1 year or more). The most significant change in the number of employees during this period was recorded in the industrial sector. In 2008 26.6 thousand people worked in the manufacturing sector in Panevezys region, while in 2010 only 18.3 thousand workers were left in the region.



Due to the declining demand for industrial labour, the regional government started a preparation of re-training programmes which were focused on the services and trade sectors that were growing at the time. However, on the longer term the retraining program led to a shortage of skilled labour in the recovering industrial sector, cause most of the employees went to service and trade sectors.

During the financial crisis and couple of years after it, the local companies were facing severe decline in corporate financial performance, this had reduced the ability of companies to invest in the technological development, therefore the demand for high-qualification employees was on a record low.

One of the main reasons that influenced the weak financial performance of companies in the Panevezys region was the decline in exports. A review of the exported products of Lithuanian origin presented in the database of the Department of Statistics shows that the most significant negative changes in 2008–2009 were recorded in these sectors:

- Vehicle and parts manufacturing;
- Electrical machinery and equipment manufacturing;
- Manufacture of audio / video recording and reproducing apparatus, parts and fittings for these products;
- Manufacturing of furniture;

The consequences of this crisis have revealed the lack of strategic preparedness of companies for external risk factors. On the other hand, the financial crisis was relevant in shaping the experience of companies that has led to a better preparation for subsequent challenges. The experience gained in crisis induced companies to start investment planning activities, to search for new markets and diversification, and to mitigate the impact of future external risk

factors. In addition the crisis facilitated to development of regional support measures especially in the field of innovation, technological development and qualification of regional employees. The economic downturn in the region has been addressed by the attempts focuses on the creation of new jobs for high-qualification employees. One of the main regional goals was to attract national and foreign investment into the region. In addition, in 2008 The Panevezys Science and Technology Park was established to support companies operating in the field of R&D, to commercialize the results of research conducted by science and study institutions, to promote the integration of business, science and studies, to foster an innovative culture, to develop high-tech business in Panevezys and the region, to promote exports, and to develop a knowledge-based economy.

The hypothesis that regional companies learnt from the experience during the Financial crisis was confirmed by the detailed review of the impact of the Russian embargo restrictions (in 2014), which did not have a significant impact on the region's economy. For example, the case of Russian embargo revealed the competitive advantages of milk processors that they managed to develop due to the investments into new technologies. Companies such as AB Rokiskio pienas didn't stop their production even though Russia was one of their main export markets, instead they chose to diversify their production by preparing more of long-term storage products (maturing cheese, milk powder), which the company has equipped in the modern warehouses. In addition, companies were very quick to diversify their export markets. Companies paid high attention to the search for new markets. Most of them were aimed at Asian countries: significant increase was recorded in exports to Indonesia, the United Arab Emirates, China, exports to South Korea, Saudi Arabia and Singapore.

Despite the fact that companies in Panevezys region have started to invest more into innovation and technological advancement, the analysis revealed that the regional enterprises are lagging behind the overall national average in the adoption of new technologies and innovations, the penetration that is taking places in the region is too slow. The tendency is that the number of companies that are buying and implementing innovative technologies are increasing, however very few of them are creating innovations or exercising R&D activities, thus companies are lagging behind from Lithuanian average in innovation adoption. One of the biggest obstacles for companies to adapt to technological change was the lack of skilled workers and the resistance of employees to change. In addition, most manufacturing companies in the Panevezys region do not specialize in mass production, but carry out small-scale production, therefore a number of production processes are still performed manually.

To sum up, the structural shocks faced by Panevezys region companies in 2005–2015 caused significant changes in the economic environment of Panevezys region. During the global financial crisis, the number of large companies decreased, while the number of small and medium-sized enterprises with up to 250 employees grew. During the financial crisis, there

was a significant increase in the unemployment rate, which led to the increased emigration of local people, and the companies was facing the slump in export volumes. Nevertheless, the experience gained by companies during the global financial crisis has contributed to the milder impact of the embargo measures imposed by the Russian Federation. The companies in Panevezys region quickly relocated their export to other markets in Asia and began to increase their export volumes to new established markets. However, currently the manufacturing sector in Panevezys region is facing another prominent problem – the slow penetration to the advanced manufacturing processes and lack of R&D activities in the region. This factor could have a long-term impact for regional competitiveness on a national and international scales. The number of technologically advanced companies in the region is growing, but one of the main reasons hindering the faster development of these processes is the insufficient supply of specialists with the necessary qualifications in the regional labor market. In order to achieve a fast and smooth transition to the high technology market, Panevezys region must pay attention to more effective solutions for business and research cooperation, to increase the internal competence of companies in the field of automation and digitization technologies, to assist companies in planning strategic action and help them to evaluate the long-term benefit of R&D based activities and assist in implementing these new processes.

## KEY POLICY PLAYERS IN PANEVEZYS REGION

This section describes how the policy ecosystem is connected in the Panevezys county and how collaboration occurs regarding different, schemes, initiatives and programmes.

Panevezys region consists of 6 districts: Panevėžys city and Biržai, Kupiškis, Panevėžys, Pasvalys, Rokiškis districts. Over the last fifteen years, the population of the Panevėžys region has decreased by almost 25%, and the birth rate has dropped by about 22%. This is one of the largest declines among all Lithuanian counties. Such demographic changes have a negative impact on the labour supply in the region, endanger the economic development of the region, and reduce the attractiveness of the region for foreign investment.

The Panevezys region currently generates 5.9% of Lithuania's gross domestic product (GDP), and its economic development lags far behind the national average - in 2016, GDP per capita was only 73.6% of the Lithuanian average. The application of the Industry 4.0 trends and effective changes in the field of industry could be an effective response to the challenges that Panevezys region is currently facing. Preconditions for the development of the Industrial 4.0 ecosystem in the Panevezys region already exist. Compared to the Lithuanian average, the industrial sector in Panevezys region is established quite well - almost a third of Panevezys region's GDP in 2015 was generated in the industrial sector. Foreign direct investment in Panevezys region increased by as much as 80% between 2010 and 2015. The largest share of foreign direct investment (59%) was targeted at the manufacturing sector.

In the beginning of 2018, Panevezys city municipality signed a cooperation agreement with 14 institutions, the main aim of this agreement is to become one of the strongest robotics centers in the North-Eastern European region. There was a commitment to support the progressive development business and science ecosystem: to encourage inventors, to ensure cooperation between science and business, to promote the development and implementation of robots in various branches of the economy, to create favourable conditions for the creation of innovations. Panevezys City Municipality has also started to develop the initiative “RoboPanevėžys”, which will create favourable conditions for industry to automate and create higher added value and help ensure the supply of targeted talents in the region. The main public or non-governmental organizations that actively work on the further development of Panevezys region are: Robotics academy, Lithuanian association of Robotics, Vocational Training Centre in Panevezys, Panevezys Chamber of Commerce, Industry and Crafts, Panevezys Science and Technology Park, Kaunas Technology University, Lithuanian Innovation Centre, Panevezys Mechatronic Centre, Panevezys University of Applied Science.

In 2018, there were 593 manufacturing companies in Panevezys region. These companies employ a quarter of the region's population. The companies include strong manufacturers of automotive components, electronic equipment, food, packaging and furniture, as well as metal and plastic processors. The economy in Panevezys region is dominated by small and medium enterprises. The concentration of Norwegian capital companies in Panevezys is extremely high - there are as many as two dozen of them. Investors from Denmark, France, Switzerland, Estonia and Germany are also willing to choose Panevezys. Some of these companies have gathered in “FIBAssociation” - Panevėžys Association of Foreign Investors, which aims to create a favourable environment for foreign investors in the region.

The manufacturing companies that want to implement robotics or automation solutions into their processes, can find partners in the same region: companies offering automation solutions are located in Panevezys: Automation Systems, Profibus, Serpentine, Technical Project, Techvitas, TPA and others.

Also, companies from Panevezys region has a great access to public support measures that are directed to mitigate various risks that companies might face during the transition from low cost manufacturing to the advanced manufacturing. One of the key group of measures to enable companies to properly prepare for various risks is the strategic diversification of export markets. The possibilities offered by public organizations to foster the international expansions are quite wide - from consultations to support for participation in exhibitions. The main institution with the greatest experience in expanding Lithuanian export markets is Enterprise Lithuania.

The other high risk for manufacturing companies is the scarcity of the skilled workforce, therefore organizations such as Agency of Science, Innovation and Technology and Lithuanian Business Support Agency have variety of open calls where SMEs could apply to improve the qualifications of their employees or retrain them in accordance to the needs in the market. Foreign investors investing in production or services business in the territory of Lithuania may train their employees using the measure “Human Resources Invest LT +” and “Training for Employees of Foreign Investors”. And other common measures such as "Competence LT", "Competence Voucher", "Inotraining" and "Inointership" are available for all Lithuanian companies. The measures are designed to increase the capacity of employees in companies to work with new technologies and thus enable them to acquire the necessary skills in foreign R&D&I centers and / or foreign companies performing R&D&I activities. Employee retraining costs could also be covered by regional municipalities which have their own support schemes. Panevėžys and Rokiškis districts offers a co-financing for the retraining employees of local companies.

In addition, there are a category of support measures to promote and encourage technological progress in SMEs. These measures allow companies to consult on innovation management, co-finance modern technologies, participate in international networking activities or establish clusters.

The least developed area of support measures is the mitigation of the risk and losses related to sudden changes in the business environment - insolvency of customers or suppliers, their loss. Small companies have access to a network of business consultants administrated by Enterprise Lithuania, but there is a lack of common strategic measures that SMEs would be able to use in order to prepare for these sudden changes in advance.

## ECONOMIC RESTRUCTURING - THE CASE OF EKCRANAS

The detailed analysis of a specific case – bankruptcy of a leading CRT manufacturer “Ekcranas” that was the biggest regional employer for four decades – shows the experience of Panevezys region companies in coping with various external factors and helps to get a better understanding of the impact that crises have to specific companies and on further development of the region. The largest company in Panevezys region and one of the largest in the whole country has not been able to remain competitive due to the rapid technological progress in the CRT market. This analysis provides an overview of the company's pre-bankruptcy activities, including the causes of the bankruptcy, and the measures initiated by the municipality and national authorities to manage the negative consequences of the bankruptcy in the region. Finally, it is assessed whether the consequences were as expected and what the possible causes were.

The history of the company "Ekranas" began in 1962, when the first technological equipment was manufactured in the temporary premises in Panevėžys. Lithuanian CRTs were bought not only by Lithuanian but also by TV factories of other countries, many of which were exported to Italy, Germany and Yugoslavia. As the demand for colour picture tubes increased, the factory was reconstructed and expanded in 1978 where the first colour tube was produced. "Ekranas" in 1985 employed 6,252 people, which accounted for as much as 21.3 percent of the city's industrial enterprises.

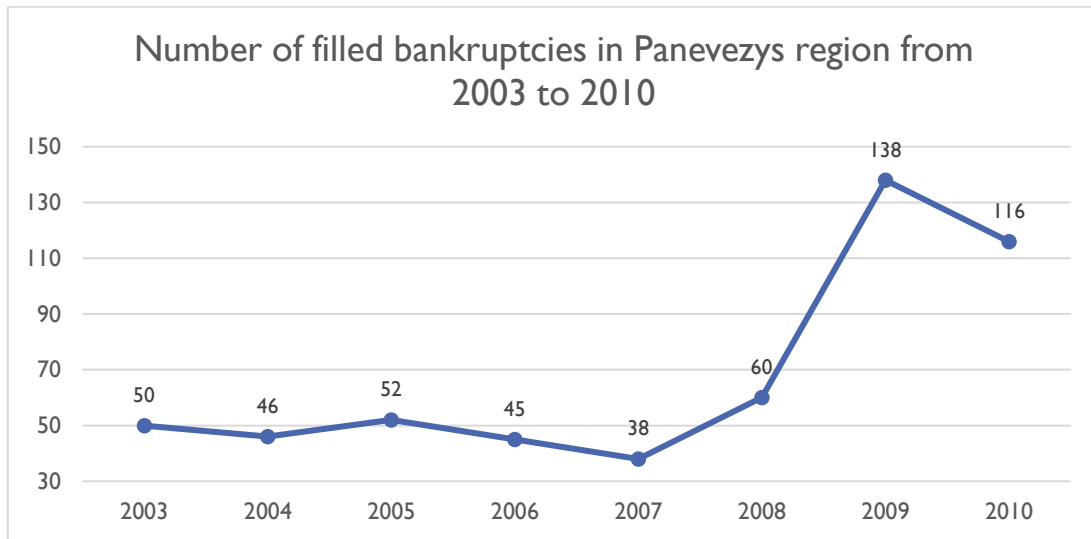
Since 2000 the competition for traditional CRT manufacturers has increased because of the emergence of new technologies that were mainly developed by Asian manufacturers. Most of the global electronics industry leaders have steadily withdrawn from the traditional CRT TVs and parts business. Since 2000 About 20 CRT plants were closed in Europe, and in the beginning of 2006 there were only three CRT manufacturers left in Europe - Samsung (Hungary), Piaseczno (Poland) and Ekranas (Lithuania). This market situation in the short term was favorable for the development of Ekranas - with the withdrawal of other CRT manufacturers, the company occupied the markets of the shrinking manufacturers and grew rapidly. Ekranas 2004 sold a record 4.57 million units, which accounted for about 3.1% of all CRTs sold worldwide. The company's sales accounted for 12.5% of the total European CRT market.

However, the drastic fall in CRT prices in 2005 and the large supply of Asian manufacturers led to the loss-making activities of Ekranas. Ekranas, unlike the global leaders in the electronics industry, had no other profitable activities that could offset the loss of CRT production. In addition, operating in a declining and low-margin (and, in recent years, loss-making) CRT market, it has not been able to raise the necessary funds to ensure its technological renewal and business continuity. Thus, after consuming all revenue to cover operating losses in the last year, the company was forced to cease production. In 2006 the company was filed for bankruptcy.

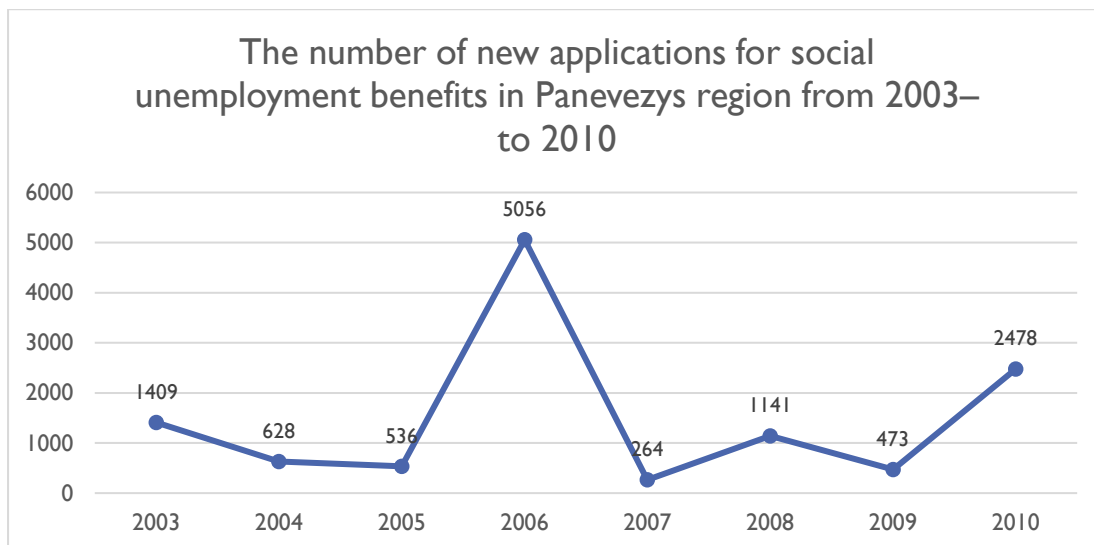
During the bankruptcy proceedings of Ekranas, it was forecasted that all economic indicators of Panevezys city and region would deteriorate, and the budget of Panevezys city municipality in 2006 alone will not receive 1.16–1.45 million EUR of income due to reduced income tax and other tax payments. This prediction was only partially confirmed. The relative stability of the economic indicators of Panevezys city and region could be explained by the fact that the bankruptcy of Ekranas took place during the years of economic growth and therefore did not cause such a large collapse of the related companies as predicted. In addition, the company was extremely large and relied heavily on its own resources and those of several large subsidiaries, so it was not so strongly "established" in the region, i.e. supply chains related to Ekranas have not been developed in the region. Analyzing the statistics, it can be seen that after "Ekranas" has filled the bankruptcy in 2006, the number of bankruptcy proceedings



opened by regional companies was relatively low, especially compared to the economic crisis that hit the country in later years.



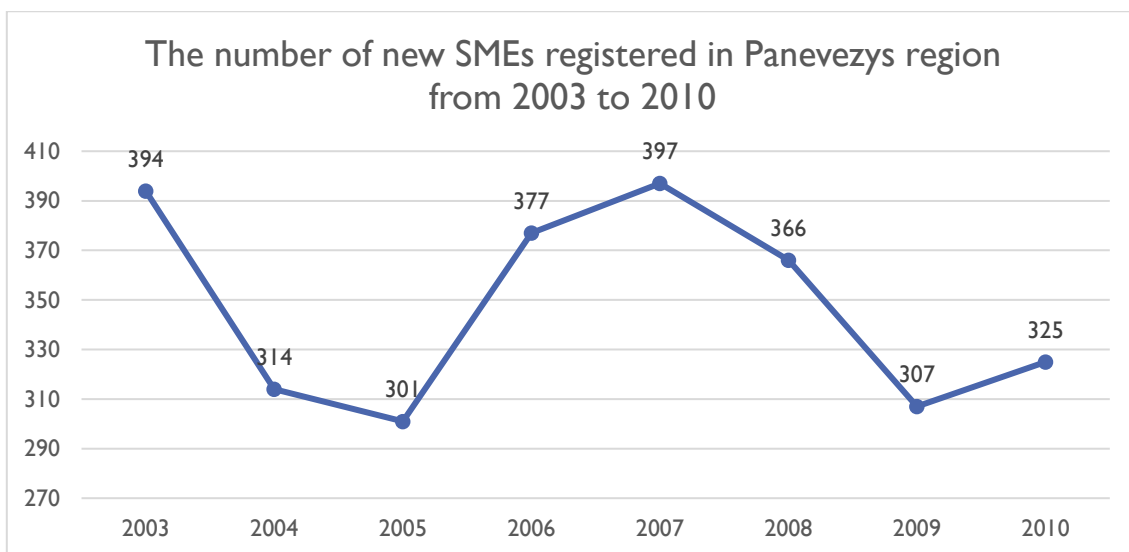
The problem of Ekranas' bankruptcy and its impact on the region is better reflected in the number of employees. Together with Ekranas, large regional employers had to fill bankruptcy, thus in total more than 5,000 employees were seeking for Social Fund benefits.



According to the data of the Panevezys County, the former employees of Ekranas have integrated into the labor market quite successfully. Almost 2,000 Ekranas employees found new jobs immediately. The unemployment rate in the Panevezys region and especially in the city was low, therefore qualified and experienced specialists were promptly taken over by the regional companies that felt the shortage of employees in the electronics, metal and other related sectors. Higher qualification engineers were especially in demand - it is assumed that a large part of them found jobs in companies in other Lithuanian cities, offering more attractive conditions than Panevezys companies could offer, or went to work and live abroad.

The former employees of Ekranas had two-fold opinion about the collapse of the company. On the one hand, the CRT manufacturer was a kind of "city within a city", ensuring long-term, specialized work and a stable rhythm of life for entire families, so the company's bankruptcy caused employees shock, anger, anxiety about the future. On the other hand, employees who spent many years in the company were motivated, accustomed to work and earn - the bankruptcy of the employer became an incentive for them to look for new, better opportunities, improve their qualifications, start their own business.

Statistics show that, compared to 2005, the number of small and medium-sized enterprises registered in the Panevėžys region increased by 25–30% during the bankruptcy period of Ekranas.



The employment situation was more difficult for lower-skilled workers, especially those over 50 and women. Due to their very narrow specialization and lack of other experience, it was much harder for them to find another job. According to the Employment Service, a total of 620 former Ekranas employees were retrained. There was no specific strategy for the specialties that employees in the region will need in the future - individuals were directed to a wide variety of training programs that they could choose for themselves. In total, about 80 retraining courses for different programs were organized.

To sum up, the bankruptcy of the CRT manufacturer Ekranas, which has been operating in Panevezys for more than four decades, revealed the impact of technological changes on business competitiveness and the region. The case study reveals that the effects of the bankruptcy were significant, but short-lived, affecting more specific companies that did not diversify their activities and supplied the bulk of their orders to this company. The closure of the company was one of the main obstacles to properly and timely preparation for the possible consequences of the crisis in the region. When the inevitability of bankruptcy became apparent, various working groups were set up to mitigate the effects of the crisis.

They were organized by the city municipality and the Ministry of Economy, many institutions were subordinated, and action plans were prepared. It is difficult to say how many consequences the measures initiated by the institutions helped to avoid, and how much the fact that there was an economic upswing and almost record low unemployment. In general, the strategic mitigation measures have not been systematic and long-term: there was a lack of attention and measures aimed at promoting technological progress of enterprises, analyzes of the trends in the labour market, measures for integration of older and lower-skilled workers into the labour market, retention of higher-skilled workers in the region, creation of small spin-offs / start-ups, attracting investors and infrastructure. The region should have aimed at measures that would increase the region's overall resilience to external risks, and the consequences of the subsequent financial crisis.

## INDUSTRY IN TRANSITION PANEVEZYS CASE STUDY

### BACKGROUND TO STRUCTURAL CHANGE

The analysis of Panevezys region business environment revealed the negative future trends in the labour market development: the insufficient supply of skilled employees in the region is a significant negative factor for the faster development of enterprises in the sector. The statistics record the overall aging of the region's population and a decrease in labour supply of almost a quarter over the period under review. Labour force participation in the Panevezys region is lower than the average in Lithuania. The data show that the share of the region's population with low education is higher than in Lithuania as a whole. The supply of education and training programs for young professionals and employees offered by vocational training and higher education institutions in the region does not meet the needs of the industry.

The regional analysis revealed a lack of initiatives by companies to use state and municipal measures to expand into new markets, invest in new technologies that could help increase their resilience to risks, mainly related to staff shortages and loss of competitive advantage. The data show that majority of local SMEs are small-scale serial production companies which claim that their competitive advantage is a manual labour, which they believe allow them to be more flexible and to quickly adapt to the consumption habits of the target markets. On the other hand, the price of labour force is rising and the shortage of skilled workforce might cause significant problems to the companies that won't invest in more advanced technologies that would allow to transition from low-skilled and low-technology manual manufacturing to more advanced manufacturing and high-quality products.

### INDUSTRY SITUATION

Panevezys region is the fifth largest in Lithuania in terms of population and GDP per capita. According to many economic indicators, the region lags behind the Lithuanian average, but the region's strength is that the industrial sector is better developed than the national average. Most of the region's industrial GDP is generated by manufacturing companies, which employ a quarter of the region's population.

Although municipalities in the Panevezys region are dominated by different manufacturing sectors, the most important sector in the region in terms of number of employees is the food and beverage industry. A large part of the population also works in transport and its equipment manufacturing, furniture manufacturing, chemicals, pharmaceuticals, minerals and rubber companies, and in Panevezys city a large number of residents are also employed in the metal and metal products manufacturing sector.

The foreign direct investment and wage indicators are consistently growing - a short-term but rather sharp decline was observed only in 2008–2009 - during the global financial crisis. Most of the investments come from the Scandinavian countries, which at the same time are the main export markets for the products produced in the Panevezys region. The importance of

these markets increased sharply during the examined period, while exports to countries such as Russia or Turkey decreased several times.

It is difficult to predict whether the growth of the region's economic indicators will be sustained for a long time. Over the past 15 years, the region's workforce has shrunk by almost a quarter. In addition, the number of students that could enroll into vocational training and higher education is declining every year. Although the unemployment rate in the Panevezys region is higher than in the country, a very small part of vocational school students and students of higher education institutions study engineering programs that are the most relevant to the region's industry. Thus, it is likely that the supply of available labour force won't meet the business needs in the future. Also there are additional factors that might hinder the development of business or attraction of new investors: the fact that the region, especially in the districts away from Panevezys city, lacks the infrastructure needed by investors, and the potential of the existing infrastructure which was developed to facilitate the collaboration between science and business organizations is not fully exploited.

The aim of this study was to evaluate the potential for the future growth, identify the most prominent threats that could hinder the regional development and identify whether companies are active in preparation of their own growth and resilience strategies. The analysis of the industry in Panevezys region was conducted using 2 methods - a questionnaire survey and a structured interview. The aim of the questionnaire survey was to review the general business tendencies in Panevezys region: the level of preparation for external risk factors. During the interview, the managers of various companies were also asked to provide insights into relevant measures that, in their opinion, contribute or could contribute to the promotion of Lithuanian manufacturing industry and increase their competitiveness, while increasing the overall resilience of regions to structural shocks.

In total, 100 company executives agreed to participate in the questionnaire conducted by telephone. 20 company executives participated in the structured interviews. Looking at the data of the surveyed companies, the majority of the respondents were representing very small, low-turnover companies, of which about a third export to international markets. These respondents very well reflect the general picture of manufacturing companies in Panevezys region.

In order to identify the main external factors that have the highest possibility to pose the greatest risk to manufacturing companies in the Panevezys region, respondents were asked about the risks and their significance for the company's operations in the next 10 years. In addition, respondents were asked about the risks that companies had faced in the past, while assessing the significance of these risk factors for their operations.

The main external factors identified that may have the biggest effect on business in the future are: (1) the epidemic; (2) restrictions on the movement of goods and services between countries and economic difficulties in export markets, and (3) changes in the supply chain (increase in raw material prices, withdrawal of suppliers, etc.). However, despite a clear identification of potential risks, only a small proportion of companies surveyed have a risk management strategy and action plan. Businesses with a higher annual turnover (from 2 to 5 million euros) and a number of employees (100 and more employees) prevailed among the

companies that are strategically ready to withstand possible risk factors. This suggests that more attention needs to be paid to risk management for smaller companies by planning measures to enable them to prepare appropriate risk management strategies and action plans.

Investigating the most significant external factors that companies have already faced in their operations, businesses identified the following: (1) epidemics; (2) economic difficulties in export markets, and (3) changes in the supply chain. It can be concluded that the global coronavirus pandemic had a greater or lesser impact on the absolute majority of businesses in the Panevezys region. In addition, some companies faced difficulties in 2008, due to the consequences of the global financial crisis. On the one hand, the experience during and after the crisis have enabled companies to gain useful know-how which they are currently using while coping with new challenges, businesses in the region have suffered damage, which has made risk management strategies and action plans even more important. Therefore, it is discovered that older companies with a variety of experience is more aware of future risk and try to build their resilience by implementation of different individual measures. In contrast, younger companies were building strategies for their growth, but not for the resilience from the external risks as they had better expectation toward the laying opportunities in the future and didn't take risks as the serious consideration.

Paradoxically, one of the reasons for the poor preparation of manufacturing companies for this crisis is the relatively long period of economic growth that has taken place so far, during which there have been no disturbing shocks. Lithuanian business has been growing every year with increasingly positive expectations, so many companies have not started to consider crisis scenarios. Analyzing the data of the survey of companies in Panevezys region, it was noticed that the probability that the company will not have their crisis management strategy increases if it has not previously had very significant negative consequences of the crisis. As much as 62 percent companies that had not previously had a significant impact on the crisis said they did not have any crisis management strategy or action plan. In comparison, 58 percent of the companies that have a risk management strategy in place have experienced severe or very severe effects of structural shocks in the past. Most of these companies have been operating for more than 10 years and have already faced the challenges of the crisis in the euro area. Thus, based on these data, it can be said that companies usually learn from their own negative experiences - only those who have suffered losses start to prepare for future risks in order to reduce the damage they cause.

One of the main causes preventing companies in the region from being fully prepared for external shocks is a lack of high-skilled employees, which is usually seen as both: cause of the problems and the risk for the future development. The majority of employees in the manufacturing sector of Panevezys region are medium-skilled employees. The number of young professionals from regional universities and colleges is not sufficient to meet a demand from manufacturing companies. As a result, companies need to devote resources to retraining or upgrading their staff's competencies. The time required by companies to train the necessary specialists within the company is significant, which does not allow to devote all resources and energy to innovative activities and the implementation of the resilience strategy.

The lack of resources, necessary knowledge or competencies are the other common problems mentioned by business owners, which prevents companies from building their resilience by making long-term investments in advanced technologies. The cause of this problem is that most of the regional companies are very small which are involved in the small batches contractual manufacturing services, thus it would be too risky for them to invest in expensive technologies and systems. Many manufacturing companies in the Panevezys region face this problem, it was identified that as many as 88 percent of the manufacturing companies in the region are really small - their annual turnover does not reach 300 thousand euros and 58 percent of the companies have less than 10 employees.

Firms that were not resilient to the structural shocks tried to adapt to the changed situation by reducing costs in order to survive an unfavourable economic period. Meanwhile, companies that prepared for shocks in advance, were keen to use the accumulated resources and adapt them to the changed environment - they developed and launched new products, sought to retrain their employees, looked for new customers. During structural shocks, such companies did not think about survival, but worried how to grasp new opportunities in changed circumstances. One of the main regional goals is that the majority of the companies in the region would be prepared for structural shocks in advance, this would allow them to exploit the uncertainty to their own advantage and innovate while other companies are struggling with problems caused by external shocks.

## TRANSITION

Preventive actions to reduce the risks that arise due to external shocks could be an effective measure to mitigate the financial and other consequences for businesses, employees and the entire industrial ecosystem of the Panevezys region. It is recommended to increase the availability of high-quality specialized consulting services which would help companies to assess potential risks, prepare action plans for their management and provide appropriate monitoring tools.

In addition to the soft policy measures such as consultancy services and audits, the business entities could be offered to apply for specific financial instruments aimed to reduce the risk of the investment in the development and implementation of innovations, which is a universal tool to reduce the threat posed by various crises. The importance of advanced technologies was highlighted during this pandemic, when companies benefited from the introduction of digitized and automated production lines that could be managed remotely.

One of the measures that can help to compensate the lack of internal resources within SMEs and increase the resilience of the whole regions is clusterization and networking activities (more attention to supporting activities of various associations). Business clusters promote the transfer of information, the sharing of good practices and synergies in the development of new products or in international value chains in order to find new export markets for their products. Unfortunately, in the regions of Lithuania there is a low level of mutual trust between the representatives of business enterprises, internal competition does not allow to fully utilize the potential opportunities of this cooperation - therefore more than 70% the

surveyed companies do not participate in the activities of clusters, associations and confederations. Therefore, an effort should be put to increase the mutual trust among regional entities and create enforcing initiative to collaborate on R&D projects or international expansion which usually demand a lot of financial and human recourses.

## CONCLUSIONS – GOALS FOR POLICY LEARNING

In accordance to the results of quantitative and qualitative analysis recommendations were prepared to decision-makers on the areas where the improvement and development of support measures that could increase business competitiveness and regional resilience:

1. **Strengthening the business and science cooperation.** To intensify the potential of the research sector by directing it to the improvement of small and medium-sized enterprises' business processes, increasing the export opportunities of their products, expanding cluster cooperation tools, creating relevant support measures aimed at promoting the technological progress of enterprises in the region.
2. **Encourage the involvement of quadruple-helix stakeholders.** To expand the scope of information and consultation of employees. To initiate new forms of cooperation between business and vocational training and to involve local government into the improvement of the local business environment
3. **Development of resources to enable companies to adequately prepare for external risks.** To facilitate an access to quality consulting services for young companies, promote the use of insurance to external risks and carry out intensive dissemination of good practice in the area of technological development and innovations.
4. **Facilitating the viability of SMEs that face with economic difficulties.** More attention should be paid to companies' access to financial support measures and increase flexibility in meeting existing obligations. To develop a systematic monitoring tool that would allow to forecast upcoming structural shocks in the future and prepare the necessary support measures for regional economic development in advance.
5. **Increasing regional competitiveness.** The strategic regional direction of Industry 4.0 aims to attract related investments to the region, that would create new work places in the region and business-to-business orders, but according to this study, regional government should increase its capacity to welcome new investors by projecting new infrastructure projects. A new systematic, indicator-based resource planning process must be introduced into the operational functions of regional development councils, which would make it possible to anticipate possible regional shortcomings and areas for new investment.