

2017

Regional Report



Innovation Potential and Dominant Emerging Industries

Skopje Planning Region, Former Yugoslav Republic of Macedonia

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Executive Summary

The Skopje planning region is a leading economic performer and innovator at national level; however, despite these findings, the regional performance and innovation capacities lag behind EU regional averages.

The analysis of the **regional economic performance** describes the following context:

- More than 50% of the national GDP is generated in the Skopje Planning region. The region had 0.5% annual growth of the GDP per capita in the period 2010-2016, and an average annual inflation of 2% in the same period.
- The population is aging.
- The unemployment rate decreased from 36% in 2010 to 22.3% in 2017. Majority of the new employment was generated in manufacturing, construction and services, along with the public administration.
- Skopje planning region is an administrative and business centre, attracting the most educated labour force. The degree of urbanization is very high (80%) along with the density of the population per km². These numbers are favourable for the innovation potential of the economy, because higher shares of educated people and people involved in lifelong learning are found in more urbanised areas.
- The business entities operating in the Skopje planning region generate more than half of national exports and more than half of national imports.
- In the period 2010-2016 the number of small enterprises (number of employees between 10-50) along with the number of large enterprises (more than 250 employees), increased. Although the absolute numbers are not impressive, the trend marks the beginning of an important change in the structure of the regional private sector. It is a move towards SMEs and large enterprises, which are more efficient in the use of the available resources compared to the microenterprises.

The assessment of the **current innovation potential** portrays:

- A region with the most favourable structure in terms of available human capital and R&D activities at national level.
 - National centre of higher education institutions, with around 12 000 HE students entering the higher education system per annum,
 - More than 11% of the total population in the age bracket of 30-34; half of which are higher educated people;
 - Place of origin of 75% of the total national published international scientific co-publications.
- A region where R&D investments are very low, despite national leadership position. Data from Central Registry of RM indicate that in terms of finance and support, the R&D expenditure in the public sector were 0.14%, while the non-R&D innovation expenditure for SMEs only is 0.90% for 2016. The R&D expenditure for the business sector was 0.30% in 2016.

- A region where the regional innovation activities are higher than the national averages
 - One third of all SMEs which introduce *a product or process innovations* are headquartered in the Skopje planning region;
 - One half of all SMEs which introduce *a marketing and/or organisational innovations* are headquartered in the Skopje planning region; however
 - There is a poor protection of intellectual property.

The dominant emerging industries in the Skopje planning region are **mobility** and **experience** industries, closely followed by the **creative**, **mobile applications**, and **personal medical care** industries. The least developed emerging industries are the eco industries. The industry with the highest potential for growth is **the automotive components industry** in the FEZs.

The percentage of employment in MHT manufacturing is 7% in 2016. The percentage of employment in knowledge incentive industries is 7% in 2016.

The **recommendations** tackle the following elements:

- Development of a comprehensive assessment of the regional innovation potential, in comparison to EU average regional performance, in order to understand the position of the region in EU terms, not only national terms;
- Primary research for exploring the context, work, needs and requirements of the companies operating in the emerging industries;
- Development of a new regional innovation strategy, which will reflect the regional resources, and the needs of the dominate emerging industries, setting smart specialisation as its priority;
- Increase in the available infrastructure for supporting innovations at regional level; and
- Strengthening of the support for business stakeholders through increasing their internal innovation capacities and improving their innovation performance;

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Municipalities -in the Skopje Planning region

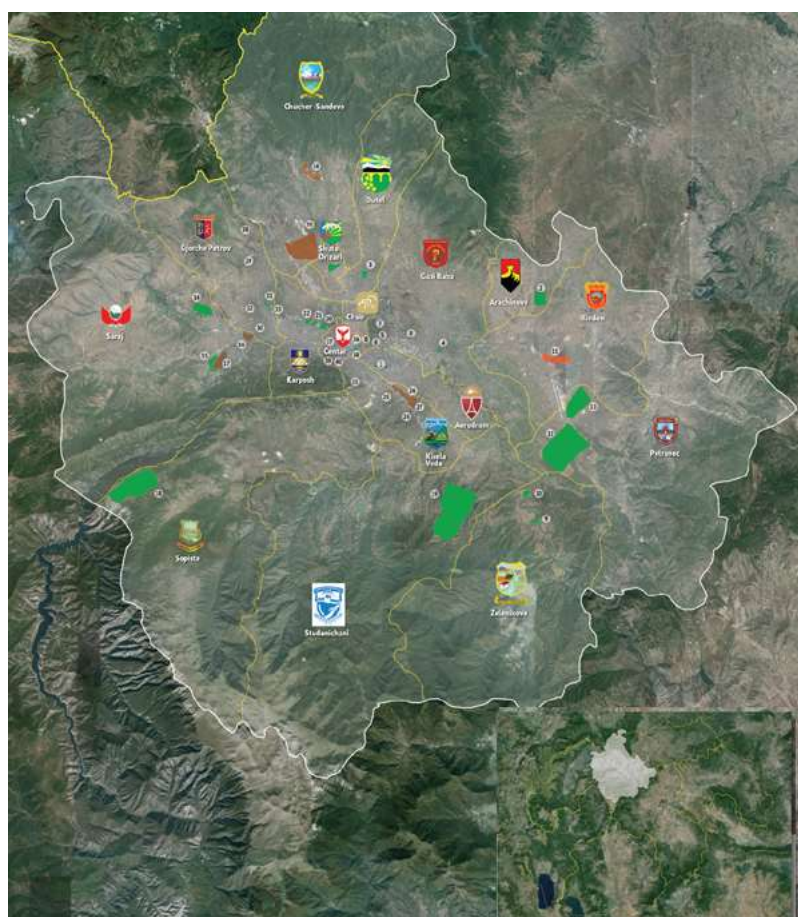
1. [Municipality of Aerodrom](#)
2. [Municipality of Kisela Voda](#)
3. [Municipality of Centar](#)
4. [Municipality of Karposh](#)
5. [Municipality of Gjorche Petrov](#)
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16. [Municipality of Chucher Sandevo](#)
17. [Municipality of Shuto Orizari](#)

1 Background

1.1 Location, Population, Economy

The Skopje region covers the basin of the Skopje valley with a total area of 1812 km². It is around 7% of the whole territory of the Former Yugoslav Republic of Macedonia. Located in the northern part of the country, its location enables fast and efficient communication with the Republic of Serbia, Republic of Kosovo, Republic of Bulgaria and Republic of Albania. There are 17 municipalities in the region, out of which 10 are part of the city of Skopje, as a separate unit of local government. Skopje region has a total of 624 585 residents, with a population density of 343 inhabitants per km², which is four times more than the country's average of 83 inhabitants per km² (State Statistical Office 2017). 88% of the residents in the Skopje region are living in the City of Skopje i.e. 25% of the country's population.

Figure 1. Map of the Skopje Planning Region



The activity rate of the population is 53.5%, almost as the national average with relative stability over the past few years (Regional Innovation Strategy of the Skopje Planning Region, 2016). The unemployment rate has seen a significant drop over the past few years. Namely, in 2008 the unemployment rate in the Skopje region was 37.3%, in 2013 it was 29.3%, whilst in 2016 it was 22.3% (State Statistics Office 2017).

Skopje region is by far the most economically strong and developed region in the country, participating with around 47% in the formation of the national GDP. The holders of the economic growth in the Skopje region are the large enterprises generating around 51% of the total production in the non-financial sector, followed by the small and medium enterprises with participation of 36% and 13% appropriately (Center for Development of the Skopje Region, 2017). On the other hand, small and medium enterprises are dominant when it comes

to the total number of employed people, i.e. SMEs employ more than 51% of the employed people. According to the National State Statistical Office (2017), the services dominate with 70% in the generation of value and 52% in employment, followed by the industry with 30% of the GDP and 34% employment. The most important industries in the region are the food processing industry, the light metal industry, construction, tourism, trade, transport, and business services. The conditions for development of agriculture in the region are limited due to the high level of regional urbanisation and the high fragmentation of the agricultural land which does not go in favour for intensifying the production. The agriculture participates with 1% in the GDP and 3% in the employment; thus referring to the relatively small meaning of the agriculture as a primary branch in this region.

1.2 Economic Potentials related to Municipalities

There are 17 municipalities in the region. Each has a distinctive characteristic:

- **Aerodrom** is among the most economically developed municipalities in the region. In the past decade it has been a national leader when it comes to start-up companies and research centres.
- **Arachinovo** is smaller rural municipality, which due to its proximity to Skopje's airport experiences steady development in the past decade in the area of trade logistics. At the same time and due to the same reason, i.e. proximity to the airport, agriculture and animal husbandry holds the potential for development of buy-off centres and/or processing capacities.
- **Butel** is an urban municipality with well-developed SME sector especially in the area of services and production of furniture, along with facilities for logistics and operations.
- **Gazi Baba** is one of the largest municipalities in the Skopje Planning Region featuring modern infrastructure and several types of industries. It is characterised with strong potential when it comes to the human resources i.e. labour force with university degree and foreign language proficiency.
- **Gjorce Petrov** is an urban-rural municipality that has been developing capacities for light and non-polluting industries in the past decade. It is characterised with strong potential when it comes to the human resources i.e. labour force with university degree and foreign language proficiency, along with natural beauties that are suitable for development of tourism and picnic places.
- **Zelenikovo** is a rural, environmentally-pure municipality which has been developing capacities in production of organic food. The vicinity and good connections with the adjacent municipalities enables development of light industry and establishment of buy-off centres.
- **Ilinden** is an urban-rural municipality very close to the international airport with a large industrial zone. The municipality was rapidly developing its capacities in production, processing along with warehousing and logistics in the past decade. The introduction of good local policies and urban planning resulted in the attraction of highly skilled labour in the municipality.

- **Karposh** is the commercial-business and university centre of the country, not only the region. The municipality also has industrial production capacities and good natural resource potentials. It is characterised with strong potential when it comes to the human resources i.e. labour force with university degree and foreign language proficiency.
- **Kisela Voda** is industrially the most developed municipality in the urban area. It is at the same time an urban-rural municipality; however, the rural part requires continuous serious investments in development of the road infrastructure along with investments in water and sewage systems.
- **Petrovec** is located at the crossroads of the regional roads and railway corridors, which ensures a modern infrastructure connection with the central part of the city. The immediate proximity of the airport enables increased tourism development as well as development of the logistics and transport industry.
- **Saraj** is mainly a rural and agriculture-oriented municipality. The pure environment enables development of agricultural and garden crops. The municipality has the advantage of potentials for development of rural, alternative, mountainous, sport and cultural tourism.
- **Sopishte** is a rural and environmentally friendly municipality, which enables development of agriculture and growing vegetables, fruit, and vine. The natural and geographic location of the municipality makes it competitive for investment in renewable energy sources, such as a wind turbine park and parks for generation of solar energy.
- **Studenichani** is a rural municipality that boasts small industrial capacities in the area of transport and logistics. It is suitable for development of buy-off centres whereas the natural characteristics give it a potential for the use of water streams and construction of mini hydro power plants.
- **Centar** as an urban municipality where the large number of tourist and business buildings enables the development of trade, administrative operation and self-sorting of services and service shops. Tourism as a competitive branch ensures development of investments in the accommodation and catering facilities.
- **Chair** is the most densely populated municipality in the Skopje Planning Region. With great unused potential the location enables a modern life and opportunities for development of business and commercial centres.
- **Chucher Sandevo** is a solely rural municipality with agriculture being its primary branch for subsistence. The closeness of the Stenkovec Sports Airport enables development of the sports and adventure tourism whereas its position on the slopes of
- **Skopska Crna Gora** also enables development of rural tourism. Transport and logistics activities are present in the municipality, along with small light industry, which offers the municipality good potentials for further development.
- **Shuto Orizari** is suitable for investment in the generation of solar energy. Such an opportunity is also the highest and most competitive advantage in the municipality.

2 Methodology

2.1 Research Goal and Objectives

The main goal of the study is to provide a detailed analysis of the regional competitiveness of the Skopje Planning Region, with a specific focus on the dominant emerging industries as the driver of future economic development in the region. InnoPlatform project uses the EU INOVA definition of an emerging industry which is the base of the EU approach in identifying the emerging industries. The emerging industries are “industrial sectors, typically based on new products, services, technologies or ideas, which are in early stage development and are characterised by high-growth rates and market potential.”

The main objectives of the report are:

- To assess the current regional innovation potential at macro and micro;
- To identify the dominant emerging industries which characterise the economy of the region;
- To explore strength and weakness of the region over a specific period of time (2010-2017);
- To provide a comprehensive analysis and recommendations structured in a way which will enable a range of key stakeholders to make informed decisions.

2.2 Innovation – Definition and Determinants

There are many definitions of what constitutes innovations today. For the purpose of the analysis we will work on the European Commission understanding of the term which is emerges from the work of Urabe et.al. (1988, p. 134), who as a result of a comprehensive international comparisons of innovations and practices for managing of companies defined innovations as the process of generating new idea and their actual realization into a new product, process, procedure or service which results into a dynamic growth of the national economy and increase of the employment along with the creation of a clean profit from the business innovation of the enterprise”. As described by the Innovation Union plan (EC 2018), Innovation “broadly means change that speeds up and improves the way we conceive, develop, produce and access new products, industrial processes and services. Changes that create more jobs, improve people's lives and build greener and better societies.”

2.3 Nomenclature of Territorial Units for Statistics

In 2007, the Government of Former Yugoslav Republic of Macedonia adopted the Nomenclature of Territorial Units for Statistics – NTES (“Official Gazette of the Republic of Macedonia” No. 158/2007) and in 2014 adopted amendments (“Official Gazette of the Republic of Macedonia” No. 10/2014). The NTES nomenclature provides a single and uniform breakdown of territorial units at regional and local level. Regions in The Nomenclature of Territorial Units for Statistics – NTES consists of 5 levels: NTES level 1 and NTES level 2 represent the whole territory of the Republic of Macedonia as an administrative unit, NTES level 3 consists of 8 non-administrative units – statistical regions that are formed by grouping the municipalities as administrative units of lower level, NTES level 4 consists of 80 municipalities as administrative units, and NTES level 5 consists of 1 767 settlements (State Statistics Office 2017).

2.4 Core Methodology

The core methodology used in developing the Regional studies for identification of the dominant emerging industries comes from the:

- EIS Regional 2017 Framework - has already successfully been used on many EU countries and their regions; however, it has still not been applied for assessing the regions of Cyprus, Former Yugoslav Republic of Macedonia and Albania.
- The categorization of the emerging industries which has been developed and introduced by the EU INOVA project in 2010. EU INOVA identifies and classifies seven emerging industries:
 - Creative industries;
 - Eco industries;
 - Experience industries;
 - Maritime industries;
 - Mobile services industries;
 - Mobility industries; and
 - Personalised medicine industries.

The EU RIS assesses the performance of the EU regions in several specific dimensions:

- 1) **Framework conditions**, cover conditions of utmost importance for innovations to flourish in a specific territory. At regional level, these indicators cover the: available human resources seen as agents of knowledge, and the attractive research systems.
- 2) **Investment climate**, or the financing of innovative activities covers the factors of financing and support, as well as the investments of companies in research and development activities (R&D) and innovation.
- 3) **Existing innovation activities of companies**, covers factors which determine the behaviour of innovators, the existence of business connections and the protection of intellectual property and intellectual assets.
- 4) **Impact innovation** covers the determinants as the impact on employment and the impact on sales through the use of appropriate indicators.

The overall regional economy, the business environment, and the socio-demographic trends affect these categories of factors either supporting, or challenging the innovation of the companies. Therefore, these trends also assess regional GDP, composition of employment, and the structure of the business sector.

Each consists of NACE level 4 sector categories as a way of relating the same to the traditional nomenclature of sectors and industries. The analysis is based on the use of secondary data coming from officially recognized institutions, predominantly from Eurostat, National statistical offices and other national and international institutions. APA style referencing format is used.

3 Regional Context

3.1 Economy and Growth of the Skopje Region

Indicators providing insight into the structure of the regional economy cover: (1) regional GDP growth, (2) its participation in the national GDP, (3) structure of the regional employment, and (4) the elements of the trade balance.

The Skopje planning region is economically the most developed region in former Yugoslav Republic of Macedonia with **steady growth of GDP** in the recent years (Table 3.1.). From 7.59 billion Euros PPP in 2010 it reached 9.33 billion of euros in PPP in 2015. **More than 50% of the national GDP is generated in the Skopje Planning region.** All industries participate in the generation of the added value, with agriculture being the smallest contributor. Services generate more than two thirds of the regional GDP i.e. 70% (State Statistical Office 2017).

The structure of the employment indicates that only 1% of the employed are working in agriculture, while around 30% are in manufacturing, with more than 70% of people employed in construction, services, and the public administration (State Statistical Office 2017). This is of no surprise, having in mind that the region is the national, administrative centre and the capital of the country.

The business entities operating in the Skopje planning region generate more than half of the national exports and more than half of national imports. The trade balance in the period 2010-2016 indicates growth in the negative trade balance of the region (Table 3.1.) As the national trade balance although negative, is rather constant for the same period, one can conclude that due to its population size, Skopje region absorbs most of the imported commodities in the country.

Table 3-1 Economy and Growth of the Skopje Region

	2010	2011	2012	2013	2014	2015	2016
GDP PPP (billion euros)	7,59	7,57	7,94	8,21	8,81	9,33	9,7
Structure of the Economy - Composition of employment	96,113	105,051	102,032	105,352	109,972	107,889	109,651
Agriculture & Mining	1%	1%	1%	1%	1%	1%	1%
Manufacturing	28%	29%	29%	29%	27%	28%	30%
Other (services, construction and public administration)	71%	70%	70%	70%	72%	71%	69%
Trade Balance	-1,618	-1,891	-1,957	-1,780	-1,788	-1,581	-1,999
Source: State Statistical Office (2017)							

3.2 Socio-demographic environment

Indicators providing insight into the structure of the regional socio-demographic context cover: (1) GDP per capita, (2) PPS, (last year of its availability); (3) population size by age, gender and education, (4) population density, and (5) the degree of urbanisation (%).

Table 3-2 Socio-demographic environment of the Skopje Region

Socio-demographic environment	2010	2011	2012	2013	2014	2015	2016
GDP per capita in PPP (euros)	12.565	12.468	13.002	13.372	14.262	15.028	15.566
Population size TOTAL (numbers)	604.298	607.502	610.775	614.254	617.646	620.913	624.585
Age 0-14	110.637	110.716	111.263	111.869	113.147	113.718	114.688
Age 15-64	420.643	422.075	422.320	421.912	421.105	420.910	421.150
Age 65+	72.889	74.616	77.103	80.387	83.316	86.211	88.684
Gender (numbers)							
Men	297.992	299.440	300.983	302.544	304.192	305.854	307.655
Woman	306.306	308.062	309.792	311.710	313.454	315.059	316.930
Population density (persons per km ²)	332,4	334,2	336,0	337,8	339,7	341,6	343,5
Degree of urbanisation (%)	80%	80%	80%	80%	80%	80%	80%
Source: State Statistical Office (2017)							

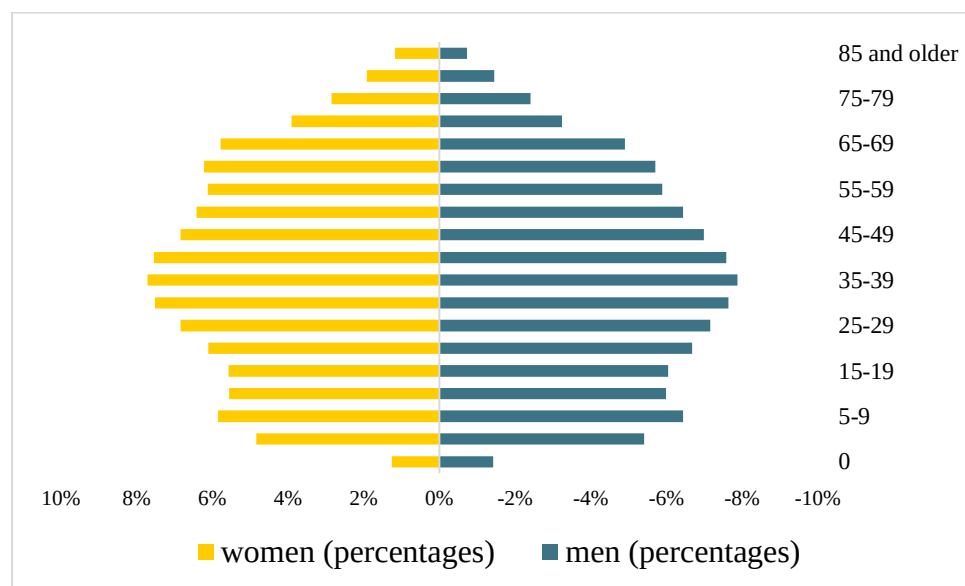
The region had 0.5% annual growth of GDP per capita in the period 2010-2016 (Table 3.2.). This is a very low growth compared to the annual inflation rate in the same period (2% average). The population pyramid presented in Figure 3.1. is not an actual pyramid, and it is the first sign that **the population in the region is aging**. The largest group of the population is in the age bracket of 35 to 49 years of age.

The active Government measures for decreasing unemployment, along with the presence of increased number of FDIs in the country resulted in decrease of the high unemployment rate at national level, from 37% in 2010 to 25% in 2017. **The unemployment rate of the Skopje region decreased from 36% in 2010 to 22.3% in 2017** (Figure 3.2.). Majority of the new employment was generated in the manufacturing, construction and services, along with the public administration. There is no data on the gender structure of the active population.

At the moment the ageing of the population increases the size of the active population. As a result of these trends, there is a growth in the active population in the same period (2010-2017) despite lower natality. Being an administrative and business centre of the country, Skopje region attracts the most educated labour force in the country and as a result the participation of the higher educated force (tertiary education) in the active population increased for 5%, in the period 2010 till 2016, while the participation of the low educated workers decreased for 7% (Figure 3.3.). The degree of urbanization is very high (80%) along with the density of the population per km². These numbers are favourable for the innovation

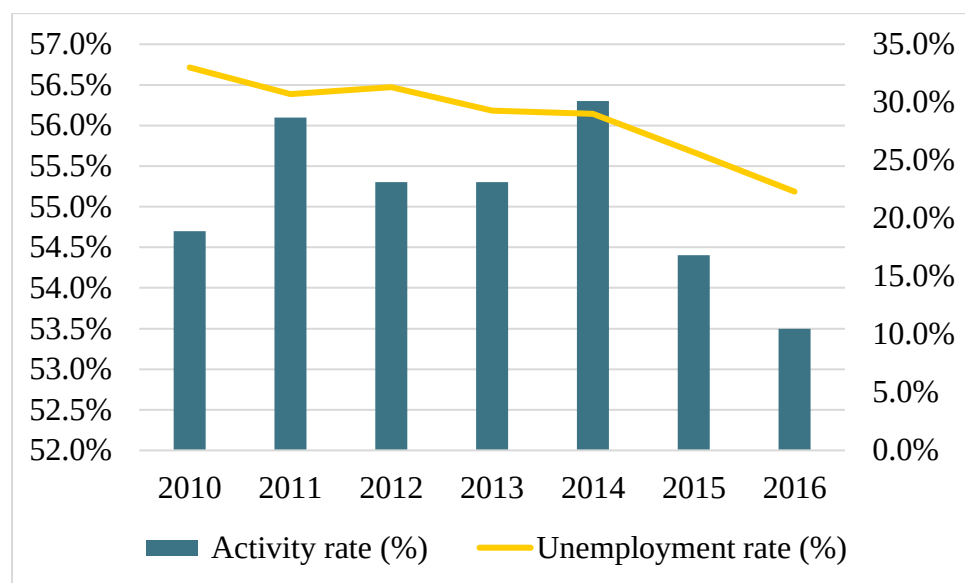
capacities of the economy, because higher shares of educated people and people involved in lifelong learning are found in more urbanised areas (Table 3.2.).

Figure 3-1 Population Pyramid for the Skopje Region 2017.



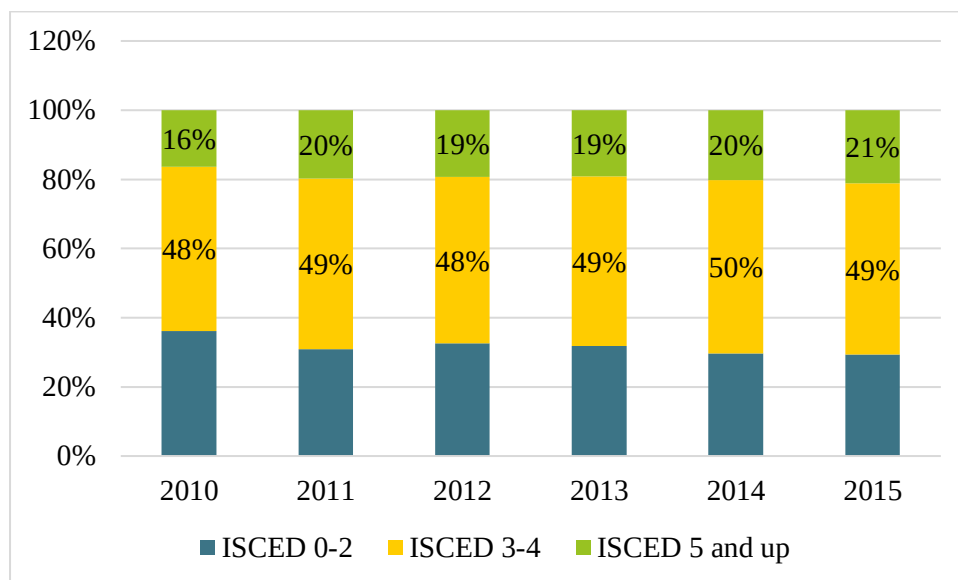
Source: State Statistical Office (2017)

Figure 3-2. Active population rate vs Unemployment rate (2010-2016)



Source: State Statistical Office (2017)

Figure 3-3. Level of education of the Active population (2010-2015)



Source: State Statistical Office (2017)

3.3 Structure of the Private sector

The innovative activities in the region depend on the structure of its private sector and its R&D activities. FDI's presence should also be noted in the analysis due to their role in technology and knowledge transfer. For understanding the trends and the movements in the private sector, the analysis explores the following trends:

- Structure of the Private sector:
 - Composition of (total number and share (%))
 - Micro enterprises (0-9 employees);
 - SMEs (10-249 employees);
 - Large enterprises (250+ employees);
 - Share of foreign controlled enterprises (%)

Similar to the rest of the country, the structure of the private sector in the Skopje planning region is dominated by SMEs, with microenterprises (with employment of 0-9) being the most numerous (Figure 3.4.). **The period 2010-2016 marks a trend of an increase of the number of small enterprise i.e. with numbers higher than 10 employees, along with increase of the number of large enterprises.** Although the absolute numbers are not impressive, the trend marks the beginning of **an important change in the structure of the private sector in the region, towards entities i.e. SMEs and large enterprises, which are more efficient in the use of available resources compared to microenterprises.**

Figure 3-4Trend in the Structure of the Private sector (2010-2017)



Source: State Statistical Office (2017)

4 Innovation Environment and Performance

4.1 Description of the Regional Innovation system

The Regional Innovation System is visually presented in Appendix 1.

4.2 Human Capital and R&D activities in the region

The Skopje Region is the centre of higher education institutions in the country. The highest ranking and the largest State University SS. Cyril and Methodius is located in the city. The region also hosts more than five private Universities and higher education institutions: FON, MIT, Balkan University, University of Tourism and others. There are around 12 000 students entering the higher education per annum, majority of them are students of the State University SS. Cyril and Methodius. One third of the students in the country are residents of the Skopje region (State Statistical Office 2017).

There are no actual data on the population aged 30-34 with tertiary education in the region; however, the number can be estimated from the total population through the use of proportions increased by 30% due to the specifics of the region. The percent for 2016 is 11% of the total population aged 30-34. These estimates are provided in Table 4.1. The estimates for the population aged 25-64 engaged in lifelong education reflect the national averages. The participation is low and it is decreasing in relative terms. It is a variable which has a significant negative impact on the competitiveness of the private sector.

In terms of the attractive research systems, there are no available data for regional level. Having in mind that the Skopje region is the centre for the higher education institutions in the country, the assumption is that 75% of the total national published international scientific co-publications will come from the regional researchers. In regard to the indicator *Top 10% most cited publications*, we assume national averages.

Table 4-1 Human Capital and R&D Activities in the Region

Table 4.1. Human Capital and R&D Activities in the Region								
		2010	2011	2012	2013	2014	2015	2016
1	Available human resources							
	Population aged 30-34 with tertiary education *e	n/a	3,733	4,068	4,133	4,369	4,899	5,011
	Lifelong learning *e	3.20%	3.40%	4.00%	3.50%	3.10%	2.50%	2.80%
2	Attractive research systems							
	International scientific co-publications per million population *	205	219	242	251	304	369	366
	Top 10% most cited publications per total publications*	2,40%	4,10%	1,70%	4,90%	4,40%	4,10%	n/a
Source: State Statistical Office (2017)								

4.3 Regional investments in R&D

The investment environment or the financing of innovative activities covers the analysis of financing and support, as well as the investments of companies in research and development activities (R&D) and innovation. In general in the area of *financing and support*, the following indicators are analysed:

1. Finance and support
 - R&D expenditure in the public sector;
2. Firm investments
 - R&D expenditure in the business sector
 - Non-R&D innovation expenditures for SMEs only;

Data from the Central Registry of former Yugoslav Republic of Macedonia, indicate that in terms of finance and support the R&D expenditure in the public sector of the Skopje region is 0.14%, while the non-R&D innovation expenditure for SMEs only is 0.90%. The R&D expenditure for the business sector was 0.30% in 2016.

Table 4-2 Regional investments in R&D

Table 4.2. Regional investments in R&D								
1	Finance and support							
	R&D expenditure in the public sector	0,14%	0,14%	0,14%	0,14%	0,14%	0,14%	0,14%
2	Firm investments							
	R&D expenditure in the business sector	n/a	n/a	n/a	n/a	n/a	n/a	0,30%
	Non - R&D innovation expenditures for SMEs only	0,90%	0,90%	0,90%	0,90%	0,90%	0,90%	0,90%
Source: State Statistical Office (2017)								

4.4 Regional Innovation activities

The status of the innovation activities in the national innovation environment covers the analysis of the innovators behaviour, or the existence of business connections and the protection of intellectual property and intellectual assets.

1. Innovators
 - SMEs with product or process innovations
 - SMEs with marketing or organisational innovations
 - SMEs innovating in-house
2. Linkages
 - Innovative SMEs collaborating with others
 - Public-private co-publications
3. Intellectual assets (if available – please request data from the available institutions)
 - EPO patent applications
 - Trademark applications
 - Design applications

The indicator, **SMEs which introduced a product or process innovations**, covers the activity of SMEs which have a number of employees between 10 and 249, and belong to the NACE sectors of innovators as identified by CIS (2014). There are 6540 SMEs in all NACE sectors in the Former Yugoslav Republic of Macedonia with 10-249 employees. More than half of them, or 3943, belong to the NACE sectors of innovators in 2016. One third of these SMEs operate in the Skopje Planning Region (State Statistical Office 2017). Data indicate that almost half of SMEs, which belong to the NACE sectors of innovators and which have more than 10 employees have introduced a product, or a process innovation in the period 2010-2017 in the Skopje region – Table 4.3.

Table 4-3 Regional Innovation activities (2010-2016)

Table 4.3. Regional Innovation activities (2010-2016)								
		2010	2011	2012	2013	2014	2015	2016
1	Innovators							
	SMEs with product or process innovations.	42.59%	42.59%	42.59%	45.06%	45.06%	45.06%	45.06%
	SMEs with marketing or organisational innovations.	46.38%	46.38%	46.38%	46.13%	46.13%	46.13%	46.13%
	SMEs innovating in-house	49.40%	49.40%	49.40%	33.65%	33.65%	33.65%	33.65%
2	Linkages							
	Innovative SMEs collaborating with others.	43.33%	43.33%	43.33%	42.35%	42.35%	42.35%	42.35%
	Public-private co-publications.							
3	Intellectual assets							
	EPO patent applications.	n/a	n/a	n/a	n/a	n/a	n/a	0,82
	Trademark applications.	n/a	n/a	n/a	n/a	n/a	n/a	0,51
	Design applications.	1	0	1	1	0	0	0,10

Source: State Statistical Office (2017)

The indicator, **SMEs that introduced marketing and/or organisational innovations**, covers the activity of SMEs with employees between 10 and 249, and belong to the NACE sectors of innovators as identified by CIS (2014). Data indicate that almost half of SMEs (46%), which belong to the NACE sectors of innovators and which have more than 10 employees have introduced marketing, or an organisational innovation in the period 2010-2016 in the Skopje region.

The indicator measuring **SMEs which innovate in-house** for the same group of innovative SMEs indicates a decrease in the collaboration of SMEs with the external sources of knowledge (survey of SMEs for the year 2012-2014). This is of surprise having in mind that SMEs in the Skopje region are located nearby the best sources of knowledge in the country.

The capacity of companies to develop new products strongly affects their competitive advantage. The **intellectual assets** include the number of patent applications, the number of trade applications and the design applications.

The value of the indicator for **EPO patent applications** in 2016 in the Skopje region is 0,82, which indicates a positive trend on a regional level and at the same time it is the highest value at national level. It means that the Skopje Region is the leader when it comes to holding EPO patents. The technical information and business intelligence generated by the patenting process develops new ideas and promotes new inventions in the Skopje region. It also makes SMEs more attractive to investors who play a key role in enabling the commercialization of technology knowledge. The EPO patenting in the Skopje planning region effectively turns the

inventors “know-how” tool into a commercial tradeable asset, opening up further opportunities for business growth and job creation.

On the other side, the value of the indicator for **trademark applications** is also raising, and in 2016 in the Skopje region is 0,51, meaning that half of the trademarking of the companies is coming from this region. The development of trademarks protects and encourages innovation among SMEs. The companies can use its own trademark as a most valuable asset which gives them a better way of identification of the business among the customers and the competition and it differentiates the given products/services.

The last intellectual asset is **product design**. Obviously, there is insufficiency of how to identify and analyse methodologies and initiatives which might be relevant for future development of product design among SMEs, not only in the Skopje planning region but also in the whole country. The Skopje region implemented 0.10 design applications in 2016.

5 Dominant Emerging Industries

The report uses a combination of indicators for identifying the dominant emerging industries in the Skopje region. As explained in the Methodology section i.e. 2.3, the indicators are a combination of the EU RIS methodology 2017 and EU INOVA classification of emerging industries from 2010.

5.1 Innovation Impacts

Table 5-1 Impacts from Innovation Activities

Table 5.1. Impacts from Innovation Activities			
1	Exports in MHT manufacturing / knowledge-intensive activities	n/a	n/a
2	Employment in MHT manufacturing (% from total employment among SMEs with more than 10 employees)	6.50%	7%
3	Employment in knowledge - intensive activities (% of total employment)	5.9 %	7%
Source: Central registry of RM (2017)			

The dominant emerging industries are identified through the following indicators:

- Employment in MHT manufacturing/ knowledge-intensive activities

Number of employed persons in the medium-high and high tech manufacturing sectors include Chemicals (NACE24), Machinery (NACE29), Office equipment (NACE30), Electrical equipment (NACE31), Telecommunications and related equipment (NACE32), Precision instruments (NACE33), Automobiles (NACE34) and Aerospace and other transport (NACE35).

Statistical data indicate that ***the percentage of employment in the MHT manufacturing*** (% from total employment among SMEs with more than 10 employees) ***was 6.5% in 2015, while the data for 2016 are 7%.***

Number of employed persons in the knowledge-intensive services sectors include Water transport (NACE 61), Air transport (NACE 62), Post and telecommunications (NACE64), Financial intermediation (NACE 65), Insurance and pension funding (NACE 66), Activities auxiliary to financial intermediation (NACE 67), Real estate activities (NACE 70), Renting of machinery and equipment (NACE 71), Computer and related activities (NACE72), Research and development (NACE73), and Other business activities (NACE 74).

Statistical data indicate that the ***percentage of employment in knowledge incentive industries*** (% from total employment among SMEs with more than 10 employees) ***is 5.96% in 2015, while the data for 2016 are 7%.***

In general, the conclusion is that the high value added industries do not employ many people in the region indicating that the region struggles to build a competitive advantage in these industries.

- *Exports of MHT manufacturing*

Exports in Chemicals and chemical products (NACE Rev. 1.1 category 24), Machinery and equipment (NACE Rev. 1.1 category 29), Office machinery and computers (NACE Rev. 1.1 category 30), Electrical machinery and apparatus (NACE Rev. 1.1 category 31), Radio, television and communication equipment (NACE Rev. 1.1 category 32), Medical, precision and optical instruments (NACE Rev. 1.1 category 3), Motor vehicles, trailers and semi-trailers, and Other transport equipment (NACE Rev. 1.1 category 34).

There are no data on regional export breakdown by industry sector.

5.2 Dominant Emerging Industries

In order to explore the potential of the region, the research looks at the categorization of emerging industries identified by the EU INOVA project. These categories are explored through the use of two indicators: number of companies with dominant revenue coming from the identified NACE categories per category of industry, and the number of employees in these sectors

Data come from the Central Registry of the country and are summarised for each of the EU INOVA emerging industry for 2016, except the maritime industry which has been removed from the list from the beginning having in mind that Former Yugoslav Republic of Macedonia is a landlocked country.

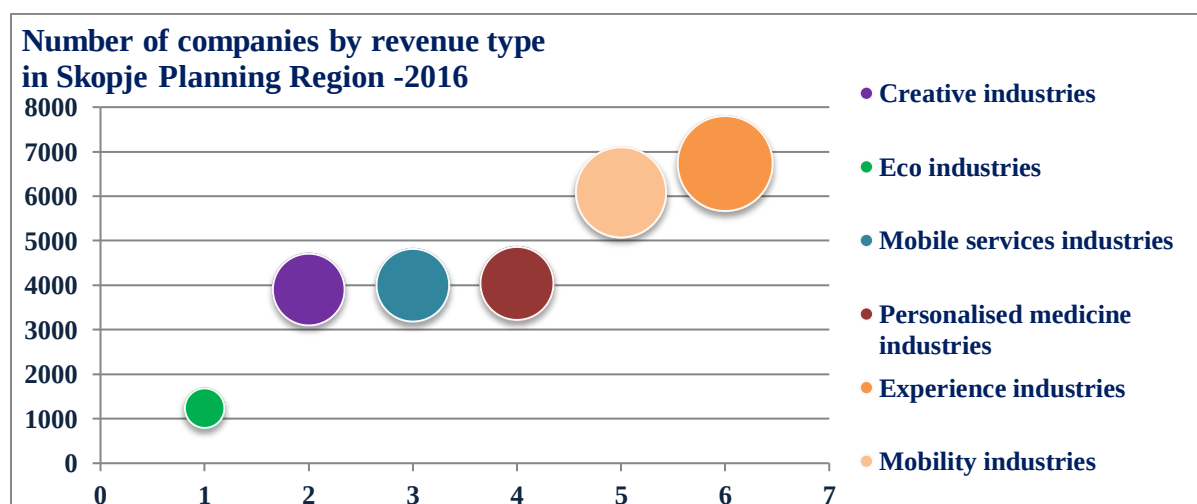
Table 5-2 Dominant Emerging Industries

Table 5.2. Dominant Emerging Industries		
	2016	
	Number of companies where the main income code belongs to the required NACE categories	Number of employees
Creative industries (summary)	3,902.00	24,372.00
Eco industries (summary)	1,238.00	18,348.00
Experience industries (summary)	6,734.00	37,803.00
Maritime industries (summary)	NA	NA
Mobile services industries (summary)	4,000.00	31,218.00
Mobility industries (summary)	6,086.00	56,171.00
Personalised medicine industries (summary)	4,040.00	35,580.00

Source: State Statistical Office (2017)

The mobility industries employ the largest number of employees and cover the largest number of companies by the revenue code. These industries cover sectors of activities that provide products and services which aim to optimize the mobility of goods and people by combining, or connecting different means and modes of transport (notably car/road, train/rail, airplane/air and ship/water), by optimizing the effectiveness and resource-efficiency or reducing the cost or environmental impact of mobility. *Therefore the mobility industries also cover the software developers and the construction of residential and non-residential facilities, along with construction of any type of infrastructure (wired and wireless).*

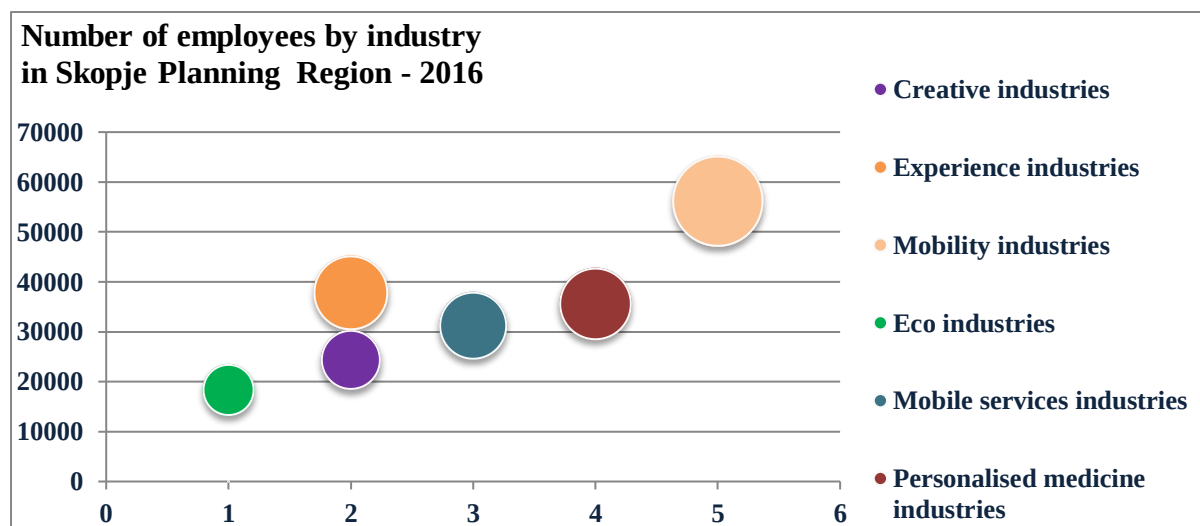
Figure 5-1. No. of companies by revenue code and industry in the Skopje Planning region



The Experience industries comprise of companies whose activities supply innovative products and services to provide customers with “experiences” that stimulate emotions and

senses, move, entertain and surprise, thrill, enthuse and involve. Experience industries include activities *traditionally associated with the sectors of tourism, culture, or leisure*, along with architecture, construction, design, interpretation, equipment supply or management consultancy.

Figure 5-2. No. of employees by industry in the Skopje Planning region



These two categories of emerging industries are closely followed by:

- **Creative industries**, which comprise activities related to the creation, production and/or distribution of creative goods and services as well as with the integration of creative elements into wider processes and other sectors. Creative industries are sometimes referred to as the cultural industries. The term creative industries encompasses a broader range of activities which include the cultural industries as well as all cultural or artistic production, whether live or produced as an individual unit.
- **Mobile services industries**, which cover companies whose activities enable the provision of telecommunication, information, and entertainment services, including voice, internet, SMS, text. They include conversation services (mobile voice and person-to-person messaging), data access services (GSM, GRPS, CDMA, EDGE, UMTS, WLAN/Wi-Fi and other methods), and content services (SMS-based, MMS-based, browser-based, downloadable applications and others), targeting both consumers (messaging services, transaction-based services, news/information services, entertainment services, mobile marketing services, consumer portal offers) and corporations (messaging services, Wi-Fi wireless access services, mobile office solutions, task-based applications, sector-based applications, corporate and professional portals).
- **Personalized Medicine industries** comprise sectors whose activities are designed to supply innovative products and services in the fields of medical technology, medical and surgical equipment and devices, Personalized Medicine information technology, Personalized Medicine infrastructure and services, clinical trials, as well as preventative Personalized Medicine care and general well-being (natural Personalized Medicine care, sport and recreation, community services, Personalized Medicine information, Personalized Medicine homes).

- **Eco industries** comprise of those industries that provide innovative products and services intending to positively influence the natural environment. This includes cleaner technologies, products and services that reduce environmental risk and minimize pollution and resource use". Among these are activities related to pollution control, collection and treatment of waste and sewage, renewable energy, recycling/recycled materials, sustainable water management, and eco-construction.

The Automotive Sector- a Leader in the Mobility Industries in the Region

The Automotive Industry is one of the most-fast growing emerging mobility industries in the Skopje Region and further. It has become one of the main forces driving economic growth in the country in the past ten years. As an industry with a long year experience at national level, it dates from the 1960s of the previous century whereby the country produced mainly components for the Yugoslavia's automotive industry, mostly for the Zastava factory. During the same period the country as well had a full production of buses (Car body "11 Oktomvri" Skopje), which, after a long delay, was renewed once again. During Yugoslav times the main export of these products was in Russia.

After the independence of the Former Yugoslav Republic of Macedonia and the privatization period, i.e. 1990s, some of these companies were bought by foreign investors and continued to produce and export components for cars, buses and trucks. However, the main breakthrough in the sector happened in the 2007, as a result of the entry of more sophisticated FDI's i.e. world-leading companies, manufacturers of components for the automotive industry. During the period from 2007 -2013, the growth of FDI's in this sector was 250%, with a tendency for further growth.

This remarkably positive trend not only had a high impact on the increase of the employment in the Skopje region, but also influenced the entire territory of Former Yugoslav Republic of Macedonia. It also changed the import/export structure and the deficit of the country, while at the same time it positively influenced on the GDP growth.

To gain a competitive advantage in a highly uncompromising automotive market driven by cost-cuts, there are Three Free Economic Zones 1, 2 and 3 (145 + 95 + 44 ha), located in the Skopje region. In each there is an adequate infrastructure to accommodate the FDI's in the field of the automotive industry. Some of the world's leading branded names of suppliers of components for the leading car manufacturers, such as Mercedes, Volkswagen, Audi, Toyota, invested in the Former Yugoslav Republic of Macedonia and the Skopje region as are: Jonson Controls (USA), Jonson Matthey (UK), TeknoHose (Italy), Kemet (USA), and Van Hool (Netherlands). Van Hool as one of the largest European bus manufacturers is effectuating full production of buses, many of which are intended for the US market.

The Skopje Region offers an ideal strategic location, and with its winning combination of a cost-competitive environment, educated and accessible workforce and well and unbeatable incentives allocated in the 3 opened Free Economic Zones, it has become attractive cost competitive operating environment for automotive components manufacturing.

Today's biggest investors in the Skopje Free Industrial Zone are:

- 1) Jonson Matthey – for production of catalysts for exhaust pipes for cars, with 2 factory buildings and total investment of 150 million Euro. It has 700 employees and currently is the largest exporter in the automotive industry from the Former Yugoslav Republic of Macedonia,
- 2) Jonson Control – for production of a PCB, with a total investment of 40 million Euro and 500 employees,
- 3) Van Hool – for production of buses, with a total investment of 20 million Euro and 500 employees,
- 4) TeknoHose – for production of reinforced high-pressure hoses, with an investment of 10 million Euro and 150 employees,
- 5) Kemet for production of condensers, with an investment of 30 million Euro and 500 employees, and
- 6) Protek- opened as a Russian Pharmaceutical Factory with a total investment of 12 million Euro and 160 employees.

Besides the aforementioned leading factories, which are located in the free economic zones around Skopje, further, there are other manufacturers of components and products for the automotive industry, which produce:

- Casting parts for car breaks,
- Mini buses, seats and equipment,
- Buses,
- Vehicle upgrades,
- Multilayer electronic printed boards,
- Diagnostic software for cars,
- Car electric,
- Springs,
- Plastic car parts,
- Tail-lamp lights and tools
- Pneumatic and hydraulic parts
- Pneumatic systems and car breaks and rail transportation
- Software for management for rail transportation, etc.

The key focus of Skopje Region is to provide favourable conditions for the majority of the automotive manufacturers and to continue building a successful establishment of production facilities and subsequent management in terms of human resources, inventory management, logistics, and quality standards compliance, so that the growing number of companies can expand their activities through acquiring and improving premises, investing in new equipment and production lines, and hiring educating and training their workforce.

6 Strengths and Weaknesses

Strengths

- Strong urban community with proximity to major transportation nodes
- Higher educated labour force
- Declining unemployment rate
- Improving private sector structure i.e. growth of SMEs on behalf of micro enterprises;
- Strong Innovation potential among SMEs operating in the innovative sectors;
- Experience and Mobility industries are on the rise in the region which explains the growth of employment in the service and high-tech manufacturing sector;
- Strong growth of the automotive components industry in the FEZs.

Weaknesses

- Increasing trend of negative trade balance
- Ageing of the population
- Poor protection of the intellectual property
- Poor data on the compound indicator on attractive research systems.

7 Conclusion and Recommendations

The Skopje planning region is a leading economic performer and innovator at national level; however, despite these findings, the regional performance and innovation capacities lag behind EU regional averages.

The analysis of the **regional economic performance** describes the following context:

- More than 50% of the national GDP is generated in the Skopje Planning region. The region had 0.5% annual growth of the GDP per capita in the period 2010-2016, and an average annual inflation of 2% in the same period.
- The population is aging.
- The unemployment rate decreased from 36% in 2010 to 22.3% in 2017. Majority of the new employment was generated in manufacturing, construction and services, along with the public administration.
- Skopje planning region is an administrative and business centre, attracting the most educated labour force. The degree of urbanization is very high (80%) along with the density of the population per km². These numbers are favourable for the innovation potential of the economy, because higher shares of educated people and people involved in lifelong learning are found in more urbanised areas.
- The business entities operating in the Skopje planning region generate more than half of national exports and more than half of national imports.
- In the period 2010-2016 the number of small enterprises (number of employees between 10-50) along with the number of large enterprises (more than 250 employees), increased. Although the absolute numbers are not impressive, the trend marks the beginning of an important change in the structure of the regional private sector. It is a move towards SMEs and large enterprises, which are more efficient in the use of the available resources compared to the microenterprises.

The assessment of the **current innovation potential** portrays:

- A region with the most favourable structure in terms of available human capital and R&D activities at national level.
 - National centre of higher education institutions, with around 12 000 HE students entering the higher education system per annum,
 - More than 11% of the total population in the age bracket of 30-34; half of which are higher educated people;
 - Place of origin of 75% of the total national published international scientific co-publications.
- A region where R&D investments are very low, despite national leadership position. Data from Central Registry of RM indicate that in terms of finance and support, the R&D expenditure in the public sector were 0.14%, while the non-R&D innovation expenditure for SMEs only is 0.90% for 2016. The R&D expenditure for the business sector was 0.30% in 2016.

- A region where the regional innovation activities are higher than the national averages
 - One third of all SMEs which introduce *a product or process innovations* are headquartered in the Skopje planning region;
 - One half of all SMEs which introduce *a marketing and/or organisational innovations* are headquartered in the Skopje planning region; however
 - There is a poor protection of intellectual property.

The dominant emerging industries in the Skopje planning region are **mobility** and **experience** industries, closely followed by the **creative**, **mobile applications**, and **personal medical care** industries. The least developed emerging industries are the eco industries. The industry with the highest potential for growth is **the automotive components industry** in the FEZs.

The percentage of employment in MHT manufacturing is 7% in 2016. The percentage of employment in knowledge incentive industries is 7% in 2016.

The **recommendations** tackle the following elements:

- Development of a comprehensive assessment of the regional innovation potential, in comparison to EU average regional performance, in order to understand the position of the region in EU terms, not only national terms;
- Primary research for exploring the context, work, needs and requirements of the companies operating in the emerging industries;
- Development of a new regional innovation strategy, which will reflect the regional resources, and the needs of the dominate emerging industries, setting smart specialisation as its priority;
- Increase in the available infrastructure for supporting innovations at regional level; and
- Strengthening of the support for business stakeholders through increasing their internal innovation capacities and improving their innovation performance;

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Appendix 1. Statistical Data

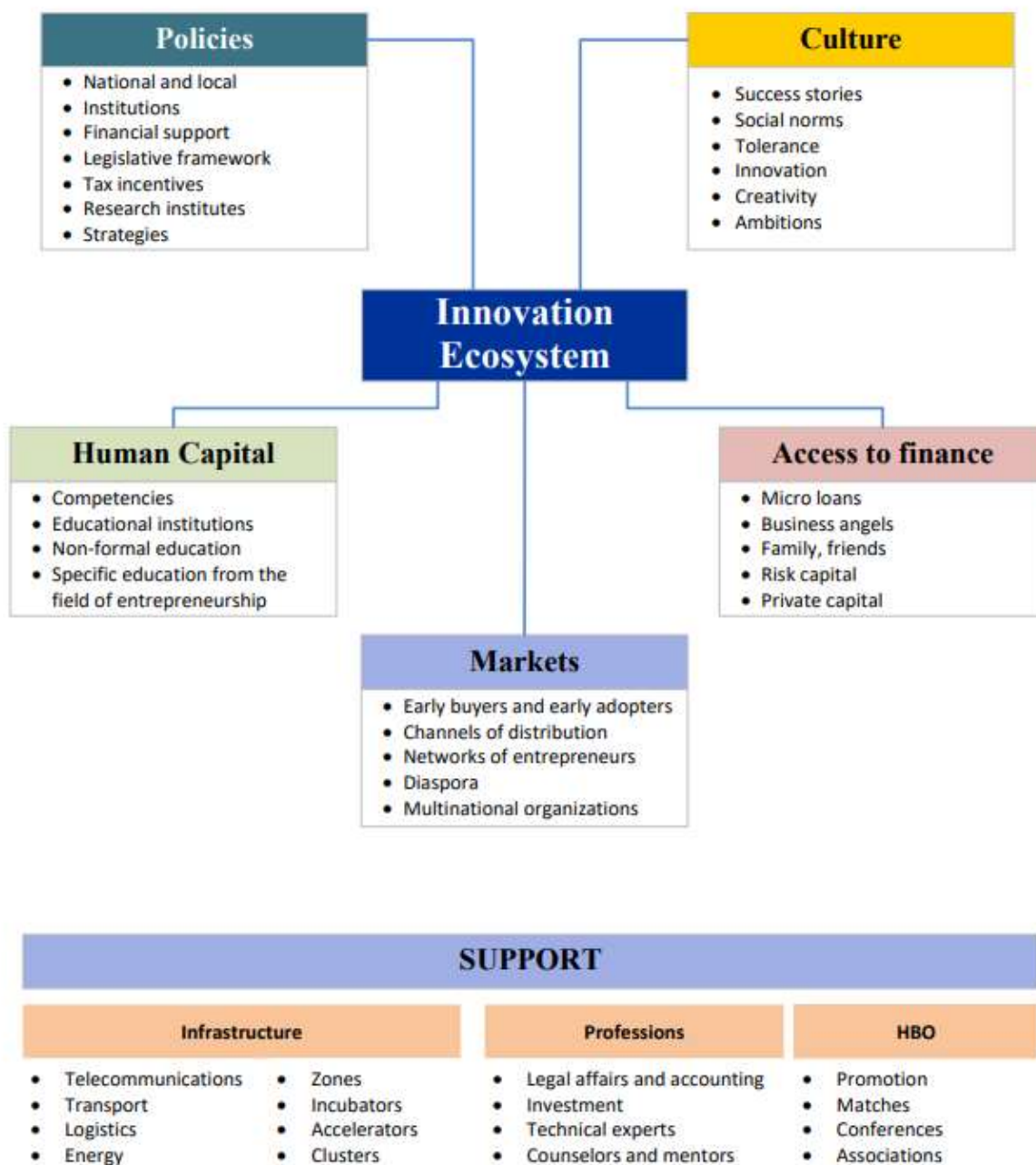
	Economy and Growth of the SK Region	2010	2011	2012	2013	2014	2015	2016
1	GDP PPP (billion euro)	7,59	7,57	7,94	8,21	8,81	9,33	9,7
	National GDP PPP (billion EUR)	17,86	18,15	18,55	19,29	20,59	21,77	22,61
	GDP participation in the total growth	43%	42%	43%	43%	43%	43%	43%
2	Structure of the Economy - Composition of employment (total)	96.113	105.051	102.032	105.352	109.972	107.889	109.651
	Agriculture & Mining	1%	1%	1%	1%	1%	1%	1%
	Manufacturing	28%	29%	29%	29%	27%	28%	30%
	All others (construction, services and etc)	71%	70%	70%	70%	72%	71%	69%
3	Trade balance (exports vs. imports)	- 1.618,27	- 1.891,15	- 1.957,12	- 1.780,26	- 1.787,61	- 1.580,64	- 1.999,00
	Exports (millions of euros)	1.218,88	1.677,45	1.584,83	1.589,06	1.962,15	2.169,12	2.659,00
	Exports from total exports			51,00%	50,00%	53,3%	53,10%	55,50%
	Imports (millions of euros)	2.837,15	3.568,60	3.541,94	3.369,32	3.749,76	3.749,76	4.658,00
	Imports from total imports			72,20%	70,30%	70,50%	68,60%	68,90%

	Socio-demographic environment	2010	2011	2012	2013	2014	2015	2016
1	GDP per capita in PPP (euros)	12.565	12.468	13.002	13.372	14.262	15.028	15.566
2	Population size TOTAL (numbers)	604.298	607.502	610.775	614.254	617.646	620.913	624.585
	Age 0-14 (numbers)	110.637	110.716	111.263	111.869	113.147	113.718	114.688
	Age 15-64 (numbers)	420.643	422.075	422.320	421.912	421.105	420.910	421.150
	Age 65+ (numbers)	72.889	74.616	77.103	80.387	83.316	86.211	88.684
3	Gender (numbers)							
	Men	297.992	299.440	300.983	302.544	304.192	305.854	307.655
	Woman	306.306	308.062	309.792	311.710	313.454	315.059	316.930
4	Population density (persons per km2)	332,4	334,2	336,0	337,8	339,7	341,6	343,5
5	Degree of urbanization (%)	80%	80%	80%	80%	80%	80%	80%

	Active labor force	2010	2011	2012	2013	2014	2015	2016
1	Active labor force aged 15y and over TOTAL (persons)	478.774	481.379	485.541	487.240	488.332	490.906	492.680
2	Activity rate (%)	54,7%	56,1%	55,3%	55,3%	56,3%	54,4%	53,5%
	Employment Total number	175.710	187.256	184.506	190.511	195.333	198.326	204.955
3	Employment rate (%)	36,7%	38,9%	38,0%	39,1%	40,0%	40,4%	41,6%
4	Unemployment rate (%)	33,0%	30,7%	31,3%	29,3%	29,0%	25,7%	22,3%
5	Active labor force by gender							
	Men	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Woman	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6	Active labor force by education (numbers)							
	ISCED 0-2	173.213	148.903	158.281	154.685	145.156	144.111	n/a
	ISCED 0-2	36%	31%	33%	32%	30%	29%	
	ISCED 3-4	227.463	237.685	233.234	239.070	244.713	242.687	n/a
	ISCED 3-4	48%	49%	48%	49%	50%	49%	
	ISCED 5 and up	78.097	94.790	94.026	93.485	98.463	104.108	n/a
	ISCED 5 and up	16%	20%	19%	19%	20%	21%	

	Structure of the Private sector	2010	2011	2012	2013	2014	2015	2016
1	Composition (numbers)	29.690	28.095	28.563	26.859	26.848	26.197	26.842
	Micro enterprises (0-9 empl.)	27.423	25.682	25.978	24.163	24.046	23.314	23.872
		92%	91%	91%	90%	90%	89%	89%
	SMEs (10 - 249 empl.)	2.151	2.298	2.460	2.569	2.678	2.746	2.831
		7%	8%	9%	10%	10%	10%	11%
	Large enterprises (250+ empl.)	116	115	125	127	124	137	139
		0%	0%	0%	0%	0%	1%	1%
2	Share of foreign controlled enterprises (%)	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Appendix 2 Regional Innovation eco-System



Regional Report on Innovation Potential and Dominant Emerging Industries



Interreg 
Balkan-Mediterranean
INNOPLATFORM

InnoPlatform project is co-funded by the European Union
and National Funds of the participating countries