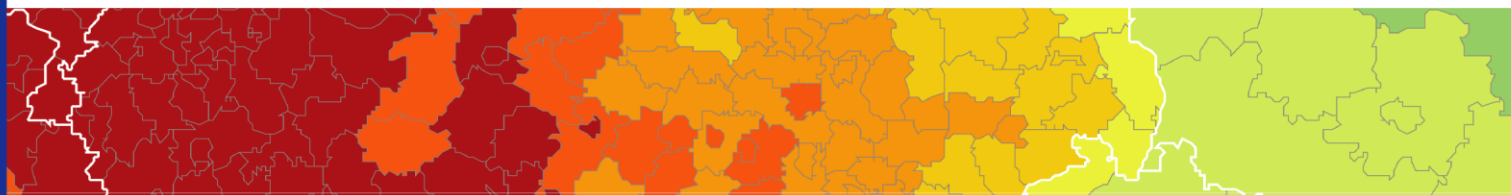


**Inspire policy making by territorial evidence**



# The Geography of New Employment Dynamics in Europe

Applied Research

**Annex to Chapter 6**

**Case Study - NORTH EAST (RO)  
Final Version**

9.3.2018

This applied research activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

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### **Technical Support**

Karen Patient, Institute for Employment Studies (UK)

### **Acknowledgements**

Sophie Hedges, Andreina Naddeo, Institute for Employment Studies (UK)

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## Executive summary

The North-East region has been selected as an exemplar case of a cluster 4 region: “a less competitive economy with low incidence of knowledge economy (KE)”.

The North-East region is the eastern frontier of the EU, bordering Ukraine and Moldova. The North-East region of Romania’s economic development has been hindered by four factors: 1) its separation from the most developed Romanian areas (i.e. Bucharest, Cluj), 2 ) its distance from the western borders, 3) its close proximity to less developed areas (i.e. Chisinau, etc) and 4) weak road and air connectivity North-East (World Bank, 2017).

The North-East region is made up of five counties: Iasi, Neamt, Vaslui, Botosani and Bacau.

With a surface area of 36,850 square km and a population of 3,256,282 people (2016 data), the North-East region is the largest and the most populated region in Romania.

Over the years, the North-East region has faced significant external migration (-2.5 percentage points between 2015 and 2000), especially after Romania’s accession to the EU. Career and study opportunities and personal issues are the main reasons motivating Romanians, including in the North-East, to emigrate. Corruption, political instability and the low quality of public services and living conditions represent the main reasons hindering people from coming back to Romania and the North-East region.

Iasi is the only one North-East county that has managed to maintain a reduced emigration level and to attract migrants, especially internal ones. In fact, Iasi is the only North-east county that has registered a positive difference in the crude migration rate (+0.5 percentage points) in the analysed period.

From an economic point of view, the North-East is the poorest region in Romania and one of the poorest in the EU. In the analysed period, GDP, income and wages have been lower in the North-East Region compared to the Romanian average despite a substantial increase over the years (i.e. +229% in GDP; +23% in wages). This results in a higher risk of poverty in the North-East region (46.2% in 2015) compared to the national average (37.3% in 2015). However, it’s worth noting that poverty is unevenly distributed in the region. Iasi is the richest county in the region, having registered higher levels of growth in GDP than the region and nation as a whole.

Lower levels of income coupled with a higher risk of poverty explains the high emigration rates in the region. Higher levels of growth in GDP and lower levels of poverty risk in Iasi county also explain its capacity to attract people.

Businesses have been attracted to the North-East region by the lower level of wages compared to other Romanian regions and the EU average, especially in knowledge economy sectors.

In the analysed period, the North-East region has registered a considerable increase in knowledge economy: +4% local active units in ICT, +18% in education, +24% in health and social assistance between 2008 and 2015; +136% increase in the turnover of firms in health

and social assistance and +79% of those in ICT between 2008 and 2015; +52% of employees in the ICT sector (author's elaboration on INSSE data).

Interviews point out that knowledge economy in the North-East region has benefited from the economic crises in Western Europe as, in order to be more competitive, enterprises have relocated their production in destinations with low labour costs, such as the North-East. Furthermore, the North-East has also benefited from a saturation of the market in more developed areas such as Bucharest and Cluj-Napoca.

Knowledge economy development is unevenly distributed in the region, being concentrated in Iasi. Iasi county hosts 41% of KE local active units and almost 50% of those in ICT. Most of the turnover in the KE has been achieved by enterprises in Iasi. Iasi county registers the highest number of employees in technical and scientific professions, in R&D and in ICT. In this latter sector, the employment performance of Iasi has overcome both the regional and national: 73% of growth in the ICT employment level in Iasi county compared to 29% at national level between 2008 and 2015. Iasi has also registered higher investments in R&D than the regional and national averages: 0.70% of GDP in Iasi compared to 0.29% in the North-East region and 0.38% at national level in 2015 (Curaj A., 2015).

Concentration of knowledge economy in Iasi is mainly due to context factors (i.e. existence of several well-regarded universities in STEM that provide a qualified pool of talent, especially in ICT and engineering) and improvement in air connectivity, business and living infrastructure triggered, in particular, by the Integrated Urban Development Strategy of the municipality of Iasi funded by the 2007-2013 and 2014-2020 Regional Development OPs. Improvement in living conditions has not only attracted businesses in Iasi, but also people. According to the World Bank (2017), Iasi is the sixth Romanian city out of 42 where those surveyed would like to move, due especially to living conditions and job opportunities.

Besides support policies (i.e. urban development strategies), knowledge economy has also been sustained through incentives to people, companies and research centres funded by national (Research, Development & Innovation funds) and European Structural and Investment Funds (2007-2013; 2014-2020 Competitiveness Operational Programmes). National authorities have been in charge of designing these incentives, while their implementation is partially carried out through intermediary bodies, such as the Agency for Regional Development of the North-East region. Incentives adopted in the analysed period include: grants to research centres/universities, researchers and companies to incentivise research development, clusterization, technological transfer and innovation; and financial and fiscal incentives to enhance employment in the ICT and R&D sector. While case study interviews reveal that financial and fiscal incentives have contributed to the development of the ICT sector in the region, the impact of the grants for research development and technological transfer are less clear. The North-East region, and in particular Iasi, is one of the top regions in terms of research projects implemented and patents submitted to the national office. Furthermore, in the analysed period there has been an increase in research collaborations between universities and the

private sector also favoured by the creation of collaborative structures (i.e. 4 clusters, a technological scientific park and business incubator; etc). However, research collaborations have not yet resulted in market products. As explained by several studies (Curaj A, 2015; Tolias, Y., 2017, World Bank, 2012), this is for several reasons: shortages in legislation on IPR, which has created mistrust between and within research organisations and companies over ownership of results; limited time frame for companies to value the market potential of a research/patent, which expires after only 5 years; limited interest and capacities of researchers for the commercialisation of their R&D portfolio.

In the last years, the potential of the Romanian diaspora for the Romanian economic development has entered the public agenda. In the current programming period, the national Diaspora-Start Up Programme has been launched within the ESF Human Capital OP. The programme foresees financial incentives and business support for Romanian emigrants who intend to open non-agricultural businesses in urban areas in Romania. Romanian emigrants funded by the programme have to be residents in Romania at the time their business opens. In order to apply for funding they have to display specific entrepreneurship experience/studies and work experience abroad in the selected business field. Even though the specific business field is not specialised, selection criteria award projects related to knowledge economy, i.e., coherence with the national economic competitiveness strategy, which focuses on ICT, R&D, biotechnologies, etc.; contribution to social innovation and transition to green economy; contribution to enhancing R&D (at least 10% of business plans of all projects should incentivise R&D and technological development); enhance ICT uptake in businesses (at least 25% of the selected business plans should focus on ICT use).

Due to several delays in the implementation of the 2014-2020 structural funds, only 32 projects have been selected. They target mostly Romanians from Italy, Greece and Spain and are implemented in all Romanian regions. While the programme is meant to attract back high-skilled migrants, its potential success is unclear. Case study interviews show that there is a demand for business support of Romanian emigrants wishing to return to Romania, but it mainly comes from emigrants that are generally active in low added value sectors (i.e. constructions, family care, agriculture, transport, etc). Case study interviews show that attracting back skilled migrants is quite difficult in the Romanian context, especially due to mistrust in public institutions, perception of a high level of corruption and the low quality of public services and living infrastructure compared to Western Europe and other countries.



# 1 Motivation for the selection of this case

The North-East region presents interesting features for the purpose of our analysis:

- It is part of cluster 4, i.e., a 'less competitive economy with a low incidence of knowledge economy', even though knowledge economy has been increasing in the last years. ICT is among the strategic economic sectors of the region. The number of multinational companies (e.g. Xerox, Continental, SCC Services Romania, Endava, Ness Technologies, etc.) and employees in the KE field has been growing very rapidly in the last years. The region is also characterised by an increase in the number of patent applications.
- It can be considered a 'sending region', i.e., a region where the outflow exceeds the inflow of migrants. However, in the last years an inverse tendency seems to have been taking place: in 2015, 65% of the in that transferred their permanent residence in Romania from another state chose the North-East region (INSE, 2015 data). In particular, Iasi county has experienced substantial immigration growth (+1,071%) between 2000 and 2015 (INSE, 2015 data).
- It has experienced several social and economic problems due to emigration along the years. Among them, a high number of 'white-orphans' (41% of the children left behind by Romanian immigrants in 2012 came from the North-East region. Source: Save the Children, 2014) and a severe brain drain, especially in the medical field (EC, 2010; IOM 2013 and 2014).
- It is a strategic area from a geopolitical point of view at both national and EU level, as it borders with Ukraine and Moldavia and represents the Eastern frontier of the European Union. In 2008, the Romanian government identified Iasi as a national development pole due to its potential for national and transnational development and its dynamic university centre.
- It is characterised by strong collaborations between universities and companies, especially in the field of ICT, aimed in particular at adapting the university curricula to the needs of companies in this field.
- Several national policy measures are foreseen on the one hand to enhance the development of knowledge economy and its potential to retain high-skilled workers (i.e. 2014-2020 European Structural and Investment Funds (ESIF<sup>1</sup>) investments in SMES, human capital, technological and innovation transfer, etc.; fiscal incentives, especially

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<sup>1</sup> ESIF are funds "jointly managed by the European Commission and the EU countries (...). The European structural and investment funds are: European regional development fund (ERDF); European social fund (ESF), Cohesion fund (CF), European agricultural fund for rural development (EAFRD), European maritime and fisheries fund (EMFF). The purpose of all these funds is to invest in job creation and a sustainable and healthy European economy and environment." European Commission, [https://ec.europa.eu/info/funding-tenders/european-structural-and-investment-funds\\_en](https://ec.europa.eu/info/funding-tenders/european-structural-and-investment-funds_en)

in ICT and research, etc.) and on the other hand to encourage Romanian migrants to invest in Romania (i.e. Diaspora Start-Up programme).



## 2 The hypotheses under analysis

Different national policy measures aim to promote knowledge economy development, as well as cooperation and business relations with the Romanian diaspora.

Programmes funded by the ESIF and national funds are both targeted within the country. Thus, they affect all regions in Romania, including the North-East region. Local authorities support knowledge economy through the development of projects within ESIF/national programmes, as they do not have direct competencies in this area. At local and regional level, universities play a relevant role in the support of the knowledge economy, through their strategies of cooperation with private companies.

The main hypotheses under investigation in the present case study refer to the contribution of three main national strategies to the development of KE in the North-East region. They are:

### 1. Incentives to people, companies and research centres

There are different types of incentives to people and research centres, among which the most relevant are:

- a) *Grants to researchers, universities and/or research centres to support research development and companies for clusterisation, technological transfer, innovation*
  - o *Grants dedicated to universities and research centres for high-level education, research projects and infrastructure; grants to universities and companies for internships (transition from university to labour market) - (National Research Development and Innovation Plan)*

The main hypotheses are:

- Grants for research contribute to consolidating the research structures of universities and other research centres and to improving/increasing their research activities. This will increase their reputation and consequently the capacity to maintain high-skilled staff and/or attract new researchers.
- Grants for internships contribute to increasing cooperation between universities and firms in the education area and to adapting students' skills to the labour market, making them more attractive on the labour market. Graduates will thus manage to find a job more easily and will stay in the region. In addition, companies will move into the region due to the existence of a talent pool.
- *Grants for clusterisation in specific sectors (ICT, biotechnologies, nanotechnologies, etc.) and for projects for technological transfer between research centres and companies* contribute to the strengthening of cooperation between them. Patents and innovations/researches are taken up in the real economy, stimulating expenditure on innovation and R&D by participating firms. This contributes to maintaining high-skilled staff in the region and to attracting a new, high-skilled work force.

- Increasing investments in innovation stimulate the demand for innovation. In turn, this stimulates high-skilled staff to remain in Romania and in the North-East.
- b) *Fiscal incentives* to companies, consisting of a reduction in income taxes in exchange for their hiring ICT, research and development employees, and for reinvesting the profits in new technology and *financial incentives* in these areas contribute to:
- Increasing the attractiveness of Romania for companies in the ICT and R&D sectors. This contributes to the creation of new companies. Consequently, occupation in these sectors increases and the two sectors manage to absorb the labour force. This results in a reduction in brain drain in these sectors.
  - Increasing the attractiveness of Romania for business development in the context of reduced economic resources available to companies for expanding their businesses. This contributes to the creation/expansion of business and consequently to an increase in occupation. The increase in labour demand contributes to an improved absorption of the labour force.
2. **Urban development integrated projects for the development of urban growth poles<sup>2</sup> (in particular of Iasi)** contribute to improving the physical and business infrastructure of Iasi. The attractiveness of Iasi for both companies and people will increase. This will contribute to increasing employment in Iasi and to maintaining/attracting people in Iasi.
3. **Diaspora Start-Up:** financial incentives and business support for enhancing urban, non-agricultural businesses by Romanian emigrants; the company has to be located in urban areas of underdeveloped regions of Romania (i.e North-East), while their founders have to be residents/have the domicile in the urban or rural areas of underdeveloped Romanian regions and to prove that they resided/had the domicile abroad in the previous 12 months

The Diaspora Start-Up programme will contribute to encouraging Romanian emigrants to return home and to increasing their capacity to develop sustainable businesses in Romania's underdeveloped regions. The businesses created then contribute to the development of knowledge economy in the respective areas.

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<sup>2</sup> "Romanian urban growth poles are defined as polarizing cities, transport hubs, concentrating economic and cultural activities, which will benefit with priority from European and national financing", Benedek J., Cristea M. (2014), Growth Pole Development and 'Metropolization' in Post-Socialist Romania, in *Studia Urbana Geographica*, Lix, 2, 2014, pp. 125 – 138, [http://www.regpol2.eu/wp-content/uploads/2015/06/Benedek\\_Cristea\\_growth-pole-development.pdf](http://www.regpol2.eu/wp-content/uploads/2015/06/Benedek_Cristea_growth-pole-development.pdf)

### 3 The profile of the area

#### 3.1 Territory

The North-East is a region of Romania bordering with Ukraine (North) and Moldavia (East) and represents the Eastern frontier of the European Union. Internally, it borders with the South-East region (South) and the Center and North-West regions (West).

Figure 3.1: North East region



Source: [http://www.adrnordest.ro/index.php?page=REGION\\_MAP](http://www.adrnordest.ro/index.php?page=REGION_MAP)

The North-East region is traditionally known as Moldavia, as it includes part of the territory of the Moldavian ancient state. The ancient Moldavia was located alongside the Russian and Ottoman empires, and the kingdoms of Hungary, Poland and Ukraine. From 1859 until 1940, it belonged to Romania, a newly state gaining its independence in 1877. With the Molotov–Ribbentrop Pact, a part of the North-East (Basarabia and northern Bucovina) was handed over to the Soviet Union. After the end of the Second World War, the ancient Moldavian territory was divided into two: the North East region of Romania and the ex-Soviet Republic of Moldavia.<sup>3</sup>

Nowadays, the North-East region is made of six counties: Bacău, Botoșani, Neamț, Iași, Suceava and Vaslui. It is the **largest Romanian region**, with a surface of 36,850 km<sup>2</sup>, representing 15.46% of the overall country surface. **58% of its surface is agricultural land**, among the highest in Romania, located mostly in Vaslui and Iași counties.<sup>4</sup>

<sup>3</sup> [http://www.adrnordest.ro/index.php?page=DISCOVER\\_PRESENTATION\\_HISTORY](http://www.adrnordest.ro/index.php?page=DISCOVER_PRESENTATION_HISTORY)

<sup>4</sup> [http://www.mdpl.ro/\\_documente/regiuni/1.NE.pdf](http://www.mdpl.ro/_documente/regiuni/1.NE.pdf)

From a geographical point of view, 28% of its territory is located in mountain areas, 60% in plateau areas and 12% in Carpathian areas (hills). The fragmentation of the relief makes road connectivity quite difficult especially in Vaslui and Bacau counties.

North-East territory is divided into **9 urban functional areas**, of which 1 **has national and transnational importance (Iasi)**, which is also the second largest city of Romania) while 8 have regional and local importance (Bacau, Botosani, Suceava, Piatra Neamt, Vaslui, Roman, Barlad and Onesti).<sup>5</sup>

Within the 2007-2013 ESIF growth strategy, the Romanian government identified **Iasi as a national development pole**, due to its potential for national and transnational development and its dynamic university centre. **Suceava and Bacau** were identified as regional **development centres** for their growth potential at the regional level.

**Long distance from the Romanian Western borders<sup>6</sup> and national economic growth poles<sup>7</sup> and closeness to less developed markets**, like the Moldavian and Ukrainian ones, **has limited the North-East Region's economic development** over time. Indeed, a 2017 World Bank report<sup>8</sup> identifies proximity to Western borders and, hence, to Western developed markets as a factor favouring economic growth of Romanian regions and cities.

The remoteness of the area from the main development poles is **not compensated by good connectivity**. Poor road, railway and air connectivity represents the **weakest feature** of the region, which **hinders the localisation of businesses in the region<sup>9</sup>**, especially in secondary cities (case study interviews, World Bank, 2017; Cojanu V., Patru-Stupariu I., Dobre R., 2011).

In the region, there is **no highway**. Road connection is ensured by 8 European roads and several national and provincial ones, and by **1,620 km of railways**. However, all case study interviewees assess them as **inadequate and obsolete** making connectivity and commuting within and outside the region very difficult.

There are also three recently created airports (Iasi, Suceava and Bacau), of which the Iasi one is the most developed. Despite several infrastructural works for the development of the three airports, they remain underdeveloped in terms of international connections if compared to the Bucharest or Cluj-Napoca airports (case study interviews, Anvensa&ADR NE, 2014). As pointed out by one of the IT business representatives interviewed, the **presence of a more**

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<sup>5</sup> ADR NE (2014) 2014-2020 Regional Development Plan of NE region

<sup>6</sup> Over 500 km from the NE region to the Nadlac western frontier

<sup>7</sup> 230 km away from Bucharest

<sup>8</sup> World bank (2017) Magnet cities: migration and commuting in Romania

<sup>9</sup> It's worth considering that 94% of the companies surveyed within a study on the ICT development in the region consider that the infrastructural development of the region could contribute to its economic development (OPI Access Project Investments, 2015).

**developed airport in Iasi** represented **one of the factors for localising his firm in Iasi** and not in another city in the NE Region.

While physical infrastructure is one of the weakest features of the North-East region, its **digital infrastructure** is one of its **strong points** according to case study interviews. It is the first in the EU for average peak connection speed<sup>10</sup>.

## 3.2 Population and migration

### 3.2.1 Population

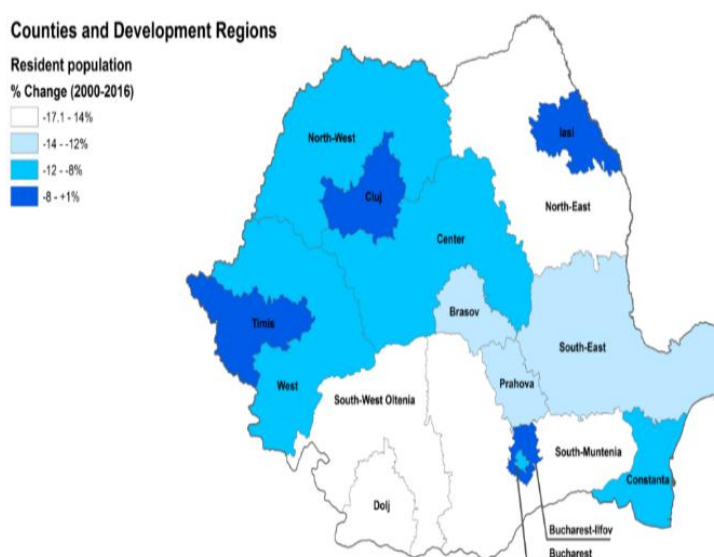
In 2016 the population of the North-East region amounted to 3,256,282 inhabitants, of whom 24% were residents<sup>11</sup> in Iasi.

Between 2000 and 2016 (last data available), the population shrank considerably in the region (-14.8%), and in particular in Neamt (-22.3%), Bacau (-20.1%), Vaslui (-16.9%) and Botosani (-14.8%). **Iasi is the only** county whose population registered only **a minor decrease** (-5.7%), due on the one hand to the **positive natural increase rate** and on the other hand to attracting migrants.<sup>12</sup>

The North-East region has **followed the national trend**. In fact, between 2000 and 2016, the population **decreased in all Romanian regions**, and **especially in poorer ones** (i.e. North-East, South-West Oltenia, South-East)<sup>13</sup>.

While all regions have experienced severe losses of population, the **main cities in Romania** (Bucharest, Cluj, Timisoara and **Iasi**) have registered a **lower reduction or even a limited increase in population**. These are also the places where economic development, in particular related to knowledge economy, and immigration takes place (World Bank, 2017).

Figure 3.2 % of change in resident population in Romania between 2000 and 2016



Source: authors' elaboration on ISSE data (2017)

<sup>10</sup> North East Region (2017) Investor's Guide 2017: invest in North-East, [http://www.adrnordest.ro/index.php?page=INVESTMENT\\_PRESENTATION\\_INVEST](http://www.adrnordest.ro/index.php?page=INVESTMENT_PRESENTATION_INVEST)

<sup>11</sup> Usual residence

<sup>12</sup> Authors' elaboration on Eurostat data, <http://ec.europa.eu/eurostat/web/population-demography-migration-projections/population-data/database>, consulted on the 24<sup>th</sup> of July 2017

<sup>13</sup> Authors' elaboration on Eurostat data, <http://ec.europa.eu/eurostat/web/population-demography-migration-projections/population-data/database>, consulted on the 24<sup>th</sup> of July 2017



Table 3.1: Population change between 2000 and 2015 in the EU, Romania and North East region

Territorial area	Population change rate between 2000-2007	Population change rate between 2007-2016
<b>EU 28</b>	2%	2%
<b>Romania</b>	-4.0%	-8.4%
<b>North-East</b>	-2.4%	-12.7%
<b>Bacau</b>	-4.0%	-16.8%
<b>Botosani</b>	-1.2%	-13.7%
<b>Iasi</b>	-2.7%	-3.1%
<b>Neamt</b>	-3.0%	-19.9%
<b>Suceava</b>	-1.3%	-11.0%
<b>Vaslui</b>	-1.6%	-15.6%

Source: authors' elaboration on Eurostat data, <http://ec.europa.eu/eurostat/web/population-demography-migration-projections/population-data/database>, consulted on the 24<sup>th</sup> of July 2017

The population **decrease after 2007**, corresponding to Romania's accession to the EU, is due **especially to external migration**. Moreover, within the region only **Iasi and Suceava have managed to maintain a positive natural increase rate** (+0.9 pp. and respectively +0.2 pp.). This reduction coupled with the population's ageing in the last years has resulted in an **increase in the old age dependency ratio**: from 19.3 into 2000 to 25.8 in 2015.

Table 3.2: Old age dependency ration in 2000 and 2015 in the EU, Romania and North East Region

	2000	2007	2015
<b>EU 28</b>	-	25.2	28.8
<b>Romania</b>	19.3	21.5	25.2
<b>North East</b>	19.0	21.6	25.8

Source: Eurostat, <http://ec.europa.eu/eurostat/web/population-demography-migration-projections/population-data/database>, consulted on the 24<sup>th</sup> of July 2017

Despite the population decrease, the **North-East region** continues to be **the most densely populated area in Romania**<sup>14</sup>. Within the region, **Iasi registers the highest density level** (147.6 inhabitants/square km in 2015), while **Vaslui the lowest** (74.2 inhabitants/square km in 2015).<sup>15</sup>

### 3.2.2 Migration

In the context of the post 1990 de-industrialisation and impoverishment of the population, external migration has started to increase and has continued to grow even to the present day (Anghel et al, 2016). Romanians are, in fact, the largest single national group (20%) from all working-age EU-28/EFTA movers across the EU 28 MS (Canetta et al, 2014). According to the World Bank (2017), **Romania is the 6<sup>th</sup> largest emigration country in the EU in absolute terms and the 1<sup>st</sup> in relative terms** (% of the overall population). The World Bank reports that around 500 inhabitants move from Romania to another country every day (World Bank, 2017). Romania is also the **EU country with the highest rate of active emigration of highly**

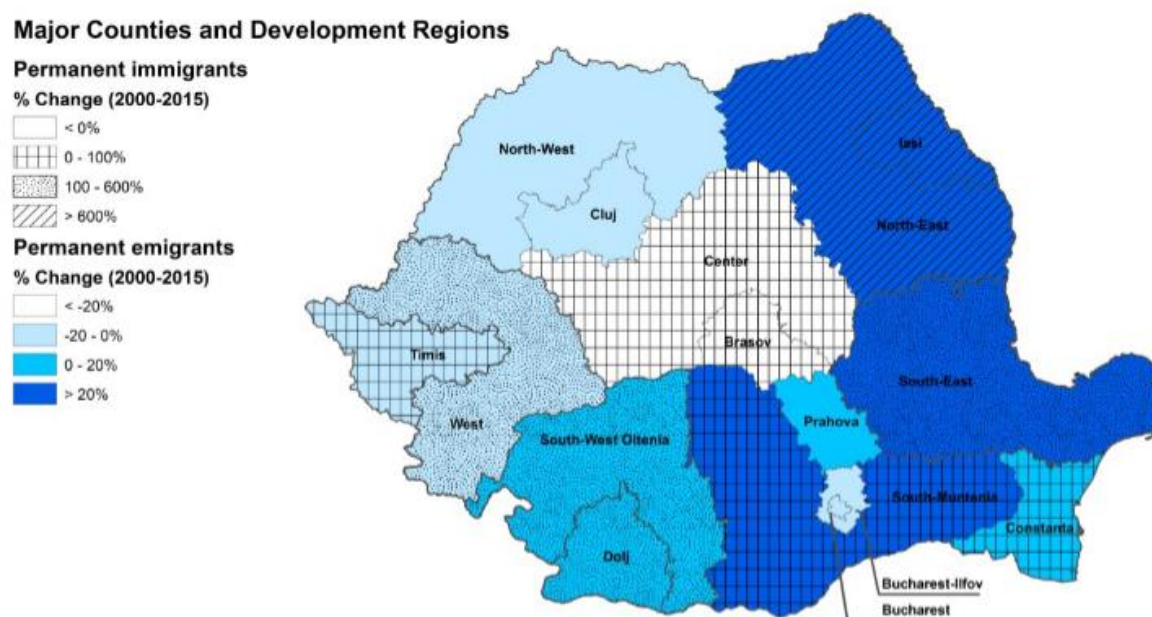
<sup>14</sup> In 2015 (last data available), population density amounts to 90.3 inhabitants/square km compared to 86.1 inhabitants/square km at national level.

<sup>15</sup> Authors' elaboration on Eurostat data, <http://ec.europa.eu/eurostat/web/population-demography-migration-projections/population-data/database>, consulted on the 24<sup>th</sup> of July 2017

**qualified people** (Canetta et al, 2014). The brain drain towards Western EU states includes students, IT specialists and doctors (Anghel et al., 2016).

The North-East region has been **the highest contributor to Romanian external and internal migration**, even though in the last years it has been able to **attract an increasing number of permanent immigrants**.

Figure 3.3: Permanent migration in Romania between 2000 and 2015 (% of change)



Source: authors' elaboration on INSSE data

## Emigration from the region

While in 2000 the region had a positive crude migration rate (0.3 persons per 1,000 inhabitants), **between 2001 and 2012 it registered a continuous negative trend**, reaching a negative peak in 2012 (-3.5). After two years of positive trends in 2013 and 2014, the crude migration rate is expected to decrease again in 2015 (-2.2).

At county level, **Botosani registered the highest negative trend. Iasi is the only one registering a positive trend** in this period, especially due to its capacity to attract migrants, in particular from Romania.

In all counties, but for Iasi, people emigrated especially in the 2000-2007 period, and in particular in 2007, corresponding to the accession of Romania to the EU. Most of them preferred **Italy as an emigration destination** (World Bank, 2017; Anghel et al, 2016).

Table 3.3: Difference in the crude rate of migration (percentage points)

Territorial area	Difference in crude rate between 2000 and 2015	Difference in crude rate between 2015-2007	Difference in crude rate between 2007-2000
Romania	-2.1	19.6	-21.7
North-East	-2.5	-0.2	-2.3
Bacau	-3.7	-0.4	-3.3
Botosani	-7.8	-0.6	-7.2
Iasi	0.5	-1.4 <sup>16</sup>	1.9
Neamt	-4.0	-0.8	-3.2
Suceava	-1.5	-1.3	-0.2
Vaslui	-1.6	4.0	-5.6

Source: author's elaboration on data of the Romanian National Statistics Institute, <http://statistici.insse.ro>

When looking at the composition of emigration in the region, one can notice that **temporary**<sup>17</sup> **emigrants outnumber permanent**<sup>18</sup> ones: 2,729 permanent emigrants in 2015 compared to 31,403 temporary emigrants. On the one hand, this may show people's intention to come back at some point in their lives and to maintain a continuous relation with Romania. In fact, some authors (Diminescu et al, 2003; Sandu et al, 2004) describe Romanian emigration as being circular, with people moving back and forth between Romania and other countries (Anghel et al, 2016). However, this seems to hold true mostly for people without higher qualifications, whereas **highly qualified migrants do not intend to return in Romania** (Morosanu, 2013; LSR, 2014). For instance, the highlyqualified emigrants from the North-East region interviewed did not express any concrete intentions to return, even though they have not completely excluded it, especially in the case of job problems.

On the other hand, the prevalence of temporary emigration may also be due to the fact that people working on the black market or in low paid jobs may not fulfil the conditions for transferring their residence abroad. In addition, foreign people (i.e Moldavians or Ukrainians) working in the region and/or in transition towards Western Europe may also constitute a part of temporary migrants.

<sup>16</sup> Even though there is a reduction in the crude rate in the analysed period, one has to consider that the crude migration rate is still positive (2.0 in 2015).

<sup>17</sup> According to the Romanian National Statistics Institute, temporary emigrants are the persons who emigrate abroad for a period of at least 12 months. Emigration means the action by which a person who had previously been usually resident in the territory of Romania, ceases to have his/her usual residence in Romania for a period that is, or is expected to be, of at least 12 months. Usual residence means the place at which a person normally spends the daily period of rest, regardless of temporary absences for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage.

<sup>18</sup> Emigration is the action by which one person ceases to have his or her permanent residence in Romania and establishes his or her permanent residence on the territory of another country. The person's permanent residence in Romania is the address where he/she declares to have the main dwelling, printed as such on their identity card and registered by the administrative bodies of the State.

In order to have a more detailed picture of the identity of the Romanian emigrants in the region in the analysed period, we are going to focus on permanent emigrants<sup>19</sup>.

**Permanent emigration** in the region is mostly **female** in the analysed period. In 2015, roughly 6 out of 10,000 men emigrated permanently to a different country (both from Romania and the North-East), compared to roughly 7.5 out of 10,000 women.

Until 2010 most of the permanent emigrants have been adults aged between 30 and 49 years old; however, **afterwards most of the permanent emigrants** have been **youths, aged between 15 and 29 years old**. It is worth mentioning that case study interviews highlight that high skilled emigration is more pronounced in certain sectors (e.g. medicine), while, in the last years, it seems more reduced in others (e.g. ICT). For instance, according to an ongoing study on youth migration in the medical sector, around 60% of the students to Iasi University of Medicine intend to emigrate abroad after finishing their studies (Botezat A. et al, 2017).

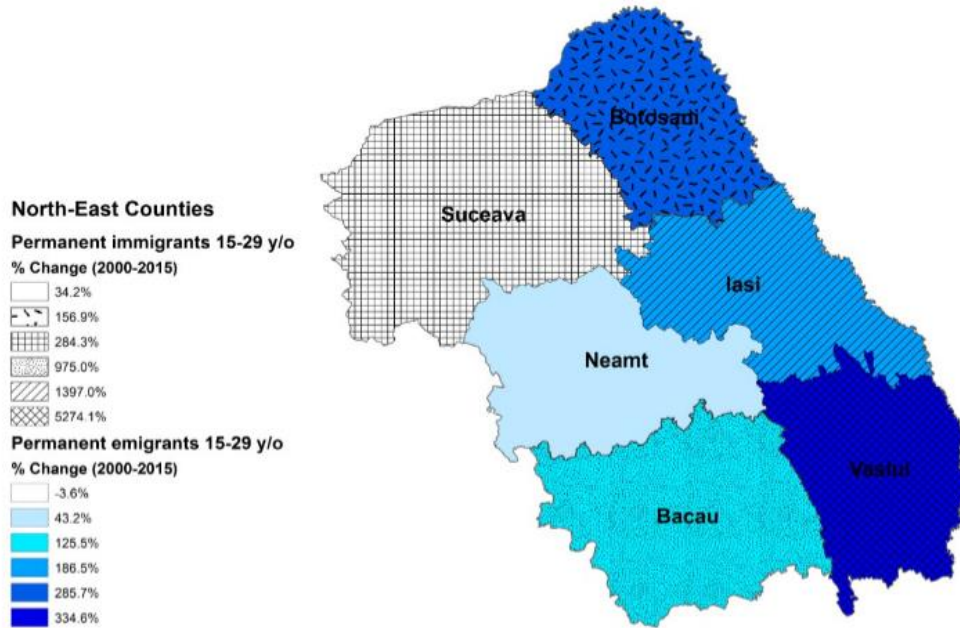
Case study interviews reveal that in the last years more and more young people are going abroad to studying. According to some interviewees, these people will hardly ever come back to Romania or to the North-East region. Even though there are no regional studies on return intention of emigrated youth/students from the North East region, the surveys undertaken by the League of Romanian students abroad seem to confirm it. A 2014 survey shows that the percentage of Romanian students abroad wishing to remain abroad after their studies (39% on the students surveyed) is higher than that of those wishing to come back to Romania (29%) (LSR, 2014).

In the analysed period **most emigrated youth come from Vaslui, Bacau and Iasi**. On the contrary, **Suceava is the only county where youth migration has decreased** both in absolute terms and reported to 1,000 inhabitants.

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<sup>19</sup> The choice to focus on permanent emigrants is also due to the fact that national data on temporary migrants is available only between 2012 and 2015, missing the years before and immediately after Romania's accession to the EU characterised by an increased emigration.

Figure 3.4 Youth emigrants and immigrants in the North East Region



Source: author's own elaboration on INSSE data

Studies on Romanian emigration emphasise **that job search, personal reasons (e.g. marriage) and studies** represent the main reasons people go abroad (World Bank, 2017; Anghel et al, 2016). Case study interviews with people from the North-East region confirm these reasons. In the case of doctors, the main motivations for emigrating abroad are the quality of life, the possibility of specialising abroad and the general working conditions (Botezat A. et al, 2017).

According to case study interviews with emigrants from the region, the existence of previous networks, quality of life and career opportunities are the main reasons for selecting a specific emigration destination. In particular, the role of family or friend networks seems to be particularly relevant. Wider national studies on Romanian emigration (Anghel et al, 2016) also confirm it.

**Corruption, political instability, low quality of public services and life**, in particular of **social infrastructure** (i.e. health and education), of **physical and green infrastructure** (i.e. streets, parks), are the **main factors hindering interviewed emigrants** from the **North-East** region **to come back to Romania** and the **North-East region**. Wider studies undertaken at national level also confirm these factors (Anghel et al, 2016; RePatriot<sup>20</sup>, 2015; LSR, 2014).

<sup>20</sup> <https://www.agerpres.ro/social/2015/12/01/studiu-70-din-romanii-din-diaspora-vor-sa-vina-acasa-dar-coruptia-si-nivelul-de-trai-scazut-ii-impiedica-21-26-21>

To this end, it is worth recalling that Romania registered among the lowest for levels of executive capacity<sup>21</sup> and accountability<sup>22</sup> in the EU in 2014, 2015 and 2016 (EC, 2016). In 2016, less than 30% of Romanian citizens reported the quality of public services as good compared to over 80% in the Netherlands and Luxembourg (EC, 2016). Romania is also among the moderate performers in e-government, the growth rate of which being below the EU average (EC, 2016). No statistics on these issues are available at regional level.

According to the Social Progress Index (EC, 2017), between 2011 and 2013 (last available period of the social index at the regional level), the North-East region ranked 268 on 272 EU regions assessed. It registered among the worst performers at the EU level on all three sub-indices composing the EU social progress index: basic human needs<sup>23</sup>, foundations of well-being<sup>24</sup> and opportunity<sup>25</sup>.

### Immigration in the region

As to immigration, the **North-East region is the Romanian region attracting the most permanent and temporary migrants** (see figure 3.5). In 2015, there were 21,181 temporary immigrants and 15,059 permanent ones<sup>26</sup>, corresponding to 6.5 temporary immigrants and to 3.8 permanent immigrants for every 1000 inhabitants.

While temporary immigration has been decreasing, **permanent immigration has been increasing** in the last years. Between 2000 and 2015, the permanent immigration rate increased by 681%.

Table 3.4: Evolution of permanent and temporary immigration in the Region between 2012 and 2015

Territorial area	Evolution between 2012-2015 (% of absolute numbers)		Evolution between 2000-2015 (% of immigration ratio <sup>27</sup> )	
	Temporary immigration <sup>28</sup>	Permanent immigration	Temporary immigration	Permanent immigration
North-East	-21%	29%	20%	28%

Source: authors' elaborations on data of the Romanian National Statistics Institute, <http://statistici.insse.ro>

<sup>21</sup> Executive capacity refers to strategic capacity, inter-ministerial coordination, societal consultation, policy communication, effective implementation, adaptability and organisational reform capacity.

<sup>22</sup> Executive accountability regards citizen's participatory competence, legislative actors' resources, the role of media, political parties and interest associations

<sup>23</sup> It includes the following dimensions: nutrition and basic medical care; shelter; personal safety

<sup>24</sup> It refers to: access to basic knowledge; access to information and communication technology; environmental quality;

<sup>25</sup> It measures the following dimensions: personal rights and tolerance and inclusion

<sup>26</sup> Romanian National Statistics Institute, <http://statistici.insse.ro>

<sup>27</sup> The immigration ratio shows the number of immigrants every 1000 inhabitants

<sup>28</sup> No data are available before 2012; Romanian National Statistics Institute, <http://statistici.insse.ro>

Even though there are no specific regional analyses on the profile of returning immigrants in the North-East region, some studies (Stanculescu and Stoiciu, 2012; Eurofound, 2012; Anghel et al, 2016) suggest that return immigration may be due to:

- A return of Romanian emigrants, especially in the context of the economic crisis that has affected the Western European states<sup>29</sup><sup>30</sup>.
- Migration from the Republic of Moldavia has increased since 2011 (+61% at the national level)<sup>31</sup>, following the adoption of the governmental resolution 36/2009 establishing a right to Romanian citizenship for foreign citizens that have lost theirs from causes independent of their will. According to interviews, in the last years North-East universities have been organising specific advertising campaigns in the Republic of Moldavia resulting in an increase in the number of Moldavian students in the region (Hess, 2016). For instance, at the University of Suceava, Moldavian students have increased by 20% only in the last academic year (Suceava University, 2016).

It is also worth noting that between 2000 and 2015, the **region attracted an increasing number of young immigrants** (15-29 years old): 5,620 persons in 2015, compared to 520 in 2000. **Over half of young, permanent immigrants chose Iasi county for their permanent residence.**

In the last years, the **North-East region** has become also **a place of internal migration.**

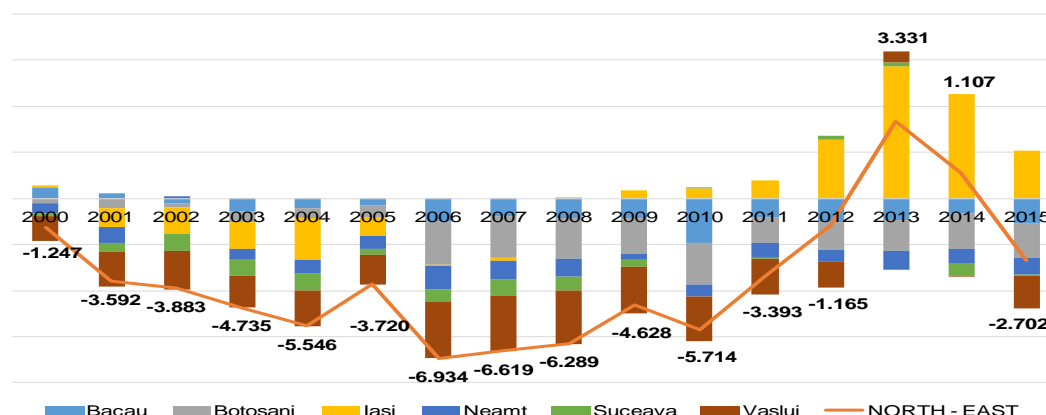
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29 Permanent immigration has been increasing steadily since 2011, in particular among people aged 30-49 years old: overall 249% between 2011 and 2015; 331% people aged 30-49 years old compared to 198% people aged 15-29 years old (source: authors' elaborations on data of the Romanian National Statistics Institute, <http://statistici.INSSE.ro>).

30 Even though there are no specific regional analyses on the profile of return immigrants in the North-East region, some studies (Stanculescu and Stoiciu, 2012; Eurofound, 2012; Anghel et al, 2016) suggest that return immigration is higher in the poorer Romanian regions with high emigration rates (i.e. North-East) and that most of the returnees come from Italy (main emigration destination in North-East) and are generally low skilled persons.

<sup>31</sup> Romanian National Statistics Institute, <http://statistici.INSSE.ro>, 2015 data

Figure 3.5: Net settling of domicile (internal migration) in the North-East region between 2000 and 2015



Source: authors' elaborations on data of the Romanian National Statistics Institute, <http://statistici.insse.ro>

The fact that the North-East region has become a place of internal immigration is **almost entirely due to the attractiveness of Iasi county**.

### 3.3 Economy and labour market

#### 3.3.1 Economic performance of the North-East region

##### Gross domestic product and poverty

Between 1992 and 2015, **Romania** registered an annual growth rate of 8.4%, making it one of the **fastest growing economies in the world** (World Bank, 2017). While **all Romanian regions benefited from this growth**, the **gap between the richer regions** (e.g. Bucuresti-Ilfov, West, North-West) and **the poorer ones** (e.g. North-East, South-West, etc) **increased** in this period (World Bank, 2017). In fact, the **North-East region registered the second lowest level of growth in GDP** at current market prices: **229% growth in the North-East region** compared to **384% in Bucharest-Ilfov** (Eurostat 2015 data, 2017).

The situation does not change when looking at GDP/capita. According to the World Bank (2017), the GDP/capita (PPS) of **Bucharest-Ilfov exceeds the EU average** by 29%, while the GDP/capita of the **North-East region is only 35% of the EU average**.

The North East also has the **lowest average monthly income** in Romania: 2,177<sup>32</sup> lei in 2015 compared with 3,671<sup>33</sup> lei in Bucharest-Ilfov (2015 INSSE data).

<sup>32</sup> Around 457 euro (Exchange rate 24th of August, 2017)

<sup>33</sup> Around 801 euro (Exchange rate 24th of August, 2017)



Despite an increase in **wage** levels between 2008 and 2015 (+23%), they remain **far below the national average**: 943<sup>34</sup> lei in the North-East region compared to 1,495<sup>35</sup> at the national level (2015 INSSE data).

Lower levels of GDP (overall and PSS), income and wages compared to other Romanian and EU regions make the North East the **4<sup>th</sup> poorest region** at the **EU level** (World Bank, 2017). According to 2015 Eurostat data, the **risk of poverty rate** (AROPE indicator) **is higher in the North East** (46.2%) compared to the **national (37.3%) and EU rates (23.7%)**, despite a **19% decrease between 2007 and 2015**. On the one hand, this **explains the higher emigration rates** compared with other Romanian regions. On the other hand, according to case study interviews, the **lower level of wages** relative to other Romanian regions and the higher level of human capital **represent two of the reasons why the North-East region is attractive to investors**.

**Poverty is unevenly distributed** between the various **North-East counties**, meaning that some areas within the region are more underdeveloped than the region as a whole (Schvab A., Pintili R., Peptenatu D., Stoian D., 2015). **Iasi county** has the **highest GDP/capita level** in the region: 23,093 RON<sup>36</sup> (INSSE, 2014 data), registering **a higher growth (30%)** compared to both the **regional (21%) and national (29%) levels** between 2008 and 2014 (INSSE data). This also explains **its lower emigration and higher immigration rates, especially internally, compared to the other counties** in the region.

### **Enterprises in the North-East region**

In 2015, most (46.2%) of the 56,000 local units<sup>37</sup> of the North-East region were active in the field of commerce and constructions, while industry local units amounted to 11.4% and agricultural ones to 4.4%. **Knowledge economy-related local units<sup>38</sup> amounted to 21.9%** of the **overall units**. In 2015, the **North-East region** was the **fourth Romanian region** by number of local active units in **ICT, professional and technical activities, education, health and social assistance and cultural and leisure activities**.<sup>39</sup>

Even though between 2008 and 2015 traditional sectors registered losses (i.e. – 23% in the commerce sector; - 16% in constructions; - 18% in manufacturing), **local active units in the**

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<sup>34</sup> Around 205 euro (Exchange rate 24th of August, 2017)

<sup>35</sup> Around 326 euro (Exchange rate 24th of August, 2017)

<sup>36</sup> Around 5,023.23 EUR (Exchange rate 24th of August, 2017)

<sup>37</sup> "The local unit is an enterprise or part thereof (e.g. a workshop, factory, warehouse, office, mine or depot) situated in a geographically identified place.", OECD (1993) <https://stats.oecd.org/glossary/detail.asp?ID=1554>

<sup>38</sup> The following sectors are considered: ICT, professional, technical and scientific activities, financial intermediation and insurances, administrative and support services activities, education; health and social assistance; cultural and leisure activities; other service activities.

<sup>39</sup> Author's elaboration on INSSE data, 2017

**knowledge economy increased** (see Annex 2): +4% in the ICT sector; +18% in education; +24% in health and social assistance and +32% in the cultural and leisure sector. In the analysed period, not only did the number of enterprises increase, but also their turnover: +136% in health and social assistance; +79% in ICT; +45% in technical, scientific and professional activities<sup>40</sup>.

Some case study interviewees explain that the **North-East ICT sector** has **benefitted from the economic crises in EU Member States** as, in order to be competitive, **many companies relocated to the North-East region and other destinations with lower labour costs**. However, **many of them are outsourcing companies, especially in the ICT sector**. Risks to the regional economy exist in the possibility that they may relocate again in search of still lower labour costs.

In 2015, **Iasi county hosted most of the knowledge economy related local units** (41%). For instance, **almost half of the ICT local active units were located in Iasi**. **Most of the turnover registered in 2015 in knowledge economy also came from firms located in Iasi** (i.e. 60% of the overall regional turnover in the ICT sector). Local **active units** in the field of **health and social services** and **ICT** registered the **highest growth in turnover** between 2008 and 2015: 221% and 107.2%<sup>41</sup>.

According to case study interviews, the **concentration of local active units in Iasi county** is due mainly to the **better physical infrastructure** compared to other areas of the region and **to the large number of well-acknowledged universities** that produce a **highly qualified labour force**.

The North-East region is characterised by a **substantial presence of innovative enterprises**. Since 2002, the percentage of **innovative enterprises has been higher in the North-East region** than at **national level** (INSSE 2014 data).

### **3.3.2 Labour market structure in North-East region and in the knowledge economy**

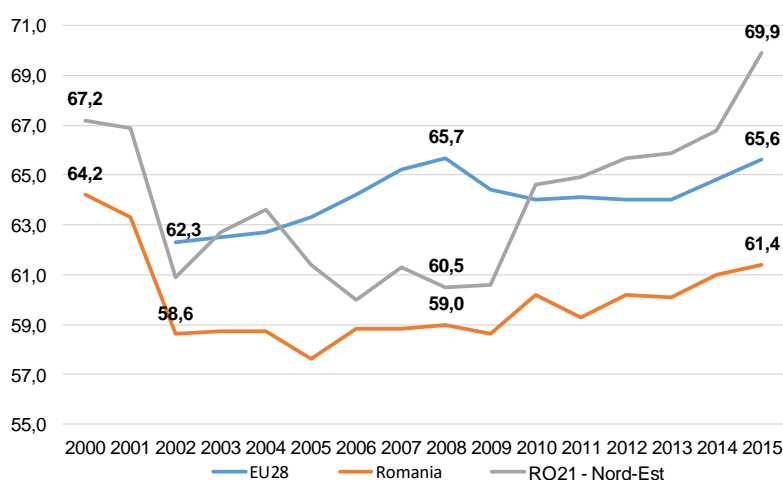
In 2015, **70% of the population in working age was employed in the North-East region** compared to **61% at national level** and **66% at EU level**. The **employment level** in the region **increased** especially between **2008 and 2015** (+16%, Eurostat data). This also corresponds to the period of localisation in the North-East of large knowledge economy companies (i.e. Continental, NESS technologies, Amazon, Oracle, etc) and to the increase in the number of enterprises in this field (see previous chapter).

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<sup>40</sup> Author's elaboration on INSSE data, 2017

<sup>41</sup> Author's elaboration on INSSE data, 2017

Figure 3.6: Employment rate in EU, Romania and the North-East region 2000-2015



Source: INSSE data, <http://statistici.INSSE.ro>

Between **2000 and 2015**, the % of youth (15-24 year olds) employed reduced by **10% in the North-East**, which matched the decline witnessed at the **EU level (-10%)** but did not fall as much as the national rate (-16%). Youth employment **decreased between 2008 and 2015**, while afterwards it increased: **+36% in the North-East** compared to 0% in Romania and -5% at the EU level (2015 Eurostat data).

In the 2000-2015 period, **the activity rates** of people **aged 25-34 years old and 35-54 years old increased** from 84% (in both cases) in 2000 to 86% in the former and 89% in the latter. On the contrary, the activity rates of youth (15-24 years old) decreased by 23% between 2008 and 2015, while afterwards they increased by 4%.

In the analysed period, the increase in the employment level in the North-East region has been accompanied by a **consistent reduction in unemployment (-47%)**, **long-term unemployment (-58%)**, **youth unemployment (-39%)** and **NEET (-49%)**. This may be due on the one hand to **an increase in employment and activity rates** and on the other hand to **an increased rate of emigration**, especially by people from rural areas, who are more at risk of unemployment due to their generally lower level of qualifications.

**Iasi is the only North-East county that has been able to reduce unemployment in all analysed periods:** -6.4 p.p. between 2015 and 2000; -1.1 p.p. between 2015 and 2007 and -5.3 p.p. between 2007 and 2000.

### Labour market in knowledge economy

In 2015, **12.7%** of the active population was **employed in science and technology** in the North-East region. Despite a **+27% increase between 2000 and 2015**, the proportion

employed in science and technology remains below the national (19.1%) and EU (31.5%) levels<sup>42</sup>.

In 2015 there were **37.4 R&D employees per 10,000 civil employed persons** in the North East which, despite having increased by **45%** between **2002 and 2015**, remains below the national level (of 52.1 employees per 10,000 in 2015)<sup>43</sup>. However, **Iasi county performed better than both the North-East region and Romania: 112.8 R&D employees per 10,000 civil employees** in 2015 in **Iasi (+82%** between 2000 and 2015) compared to 37.4 employees in the North-East region (+46% between 2000 and 2015) and 52.1 employees in Romania (+13% between 2000 and 2015)<sup>44</sup>.

In 2015, **2.1% of the North-East active population** worked in the **professional, technical and scientific services sector** (+30% compared to the 2008 level). In **this sector, Iasi county** had the **highest percentage of employees** in the North-East region: 3.2%, which is 32% higher than the 2008 level<sup>45</sup>.

In 2015, **1.8% of the active regional population** worked in the **ICT sector (+52%** compared to the **2008 level)**<sup>46</sup>. With 3.5% of its working population active in the ICT sector in 2015, **Iasi county performed better than both the North-East (1.8%) region and Romania (3.1%)**. Between 2008 and 2015, the **growth rate of ICT employment in Iasi largely exceeded the national rate**: 73% in Iasi county compared to 29% at national level<sup>47</sup>.

**10.2%** of the regional population was employed in the **health and social services** sector in 2015 (+7% compared to 2008). Among North-East counties, **Iasi** registered the **highest level of employment** in this sector (12.2%).

In 2015, Iasi county also registered **higher levels of employment** than **the regional ones** in the education and cultural, arts and leisure sectors: 13.1% of the labour workforce in education compared to 12.1% at regional level and 1.6% of the labour workforce in cultural, arts and leisure compared to 1.4% at the regional level.

Summing up, one can note that in the analysed period the North-East region registered an **increase in knowledge economy** enterprises and employment. **From a territorial perspective, the growth of this sector**, and in general of the economy, has been **largely**

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<sup>42</sup> Author's elaboration on Eurostat data

<sup>43</sup> Author's elaboration on INSSE data, 2000-2015, <http://statistici.INSSE.ro>

<sup>44</sup> Author's elaboration on INSSE data, 2000-2015, <http://statistici.INSSE.ro>

<sup>45</sup> Author's elaboration on INSSE data, 2000-2015, <http://statistici.INSSE.ro>; data refers to the 2008-2015 period due to the change of the national code of sectors in Romania and to the way of registering them in the national labour force statistics. This does not allow for comparisons between 2000 and 2015.

<sup>46</sup> Author's elaboration on INSSE data, 2000-2015, <http://statistici.INSSE.ro>

<sup>47</sup> Author's elaboration on INSSE data, 2000-2015, <http://statistici.INSSE.ro>; data refers to the 2008-2015 period due to the change of the national code of sectors in Romania and to the way of registering them in the national labour force statistics. This does not allow for comparisons between 2000 and 2015.

**unbalanced. Most of the regional knowledge economy enterprises and employees have become concentrated in Iasi county. In some sectors (i.e. ICT), Iasi county has managed even to outperform the national level. The high concentration of firms in knowledge economy in Iasi together with the high number of universities may explain the higher level of R&D investments compared to the national level: 0.70% of GDP in Iasi county compared to 0.29% in the North-East region and 0.38% in Romania.**

Several studies (Grigoras, 2001; Anghel et al, 2016) point out that **migration goes hand in hand with the level of economic development**. It is **no surprise then that Iasi county not only has the lowest emigration rates, but also attracts people in their droves, especially young people**. It is also worth mentioning that **Iasi city, the capital of Iasi county, is one of the fourth most developed and dynamic Romanian cities with the largest share of migrants working in knowledge-intensive sectors** (World Bank, 2017).

### 3.4 Education

The North-East region has **a long tradition in higher education, being the oldest university centre in Romania** and the first higher education centre in civil engineering. All interviewees agreed on the fact that **the presence of reputable and diversified universities, which provide a pool of well-qualified graduates, is the main strength of the region and has contributed to attracting a large number of firms to the region, especially in some knowledge-economy sectors (i.e. ICT).**

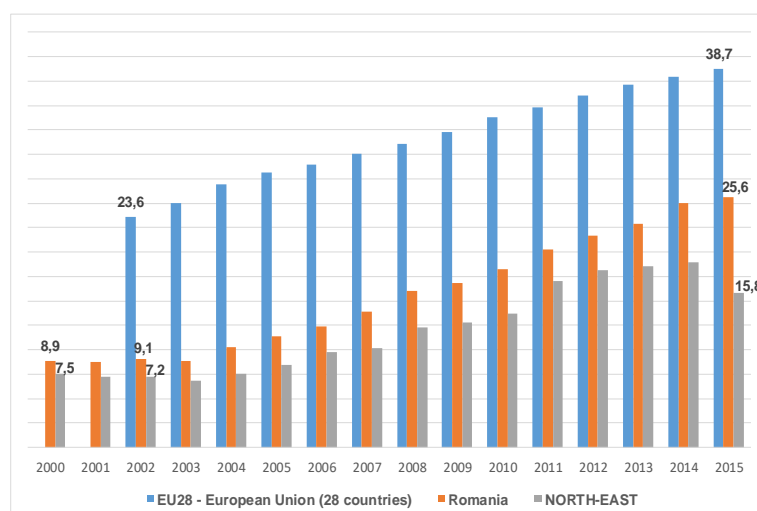
Nowadays, in the region there are **7 public universities, 4 private universities and 79 research institutes, most of which are located in Iasi** (Mironov, 2016). All universities include scientific faculties (see Annex 1).

**Iasi is the most relevant university centre in the region, and took around 90% of the students in the North East in academic year 2015-2016. Overall, 58,211 students were enrolled in public universities of the North-East region in the period 2015-2016, representing 13% of the overall students in Romania (INSSE, 2017).**

The share of the **North-East population aged 30-34 years old with tertiary education has doubled in the analysed period.**

In 2015, **62.3% of people with tertiary education from the North East obtained a bachelor's degree, 34.3% a master's degree (+1 pp. compared to the national level) and 3.3% a PhD (+0.3 pp. compared to the national level).**

Figure 3.7: % of population aged 30-34 with a tertiary education, Eurostat data



Case study interviews reveal that, in the technical and scientific fields, **low wages and the long path to achieving the title of university professor** are two of the **main reasons explaining the low number of PhD students**. All interviewees underline that, for instance, in the **IT field students find a job before finishing their bachelor's degree**, and it is generally better paid (on average **500 euro/month for a beginner**) than the PhD scholarship (300 euro/month). For instance, when looking at the PhD students of the University of Iasi, one can note that, in 2016, the number of PhD graduates in humanities (144) is double compared to that of those in scientific and technical areas (77). Furthermore, out of the 77 PhD graduates in technical and scientific areas only 3 graduated in IT. According to both public and private actors interviewed this **poses a serious threat to the development of knowledge economy** in the North-East field, as it **weakens the innovation capital** of the region and **reduces the number of university professors and researchers**. A reduction in the number of university professors has negative consequences on the number of students allocated by national authorities to each university<sup>48</sup>. In fact, despite the pressure applied by firms on STEM faculties to produce more graduates, the growth of students is blocked as the number of available places depends, among other factors, on the number of university professors. In order to overcome this problem, STEM faculties and IT companies have started collaborating to increase the number of PhD students and private specialists teaching in universities.

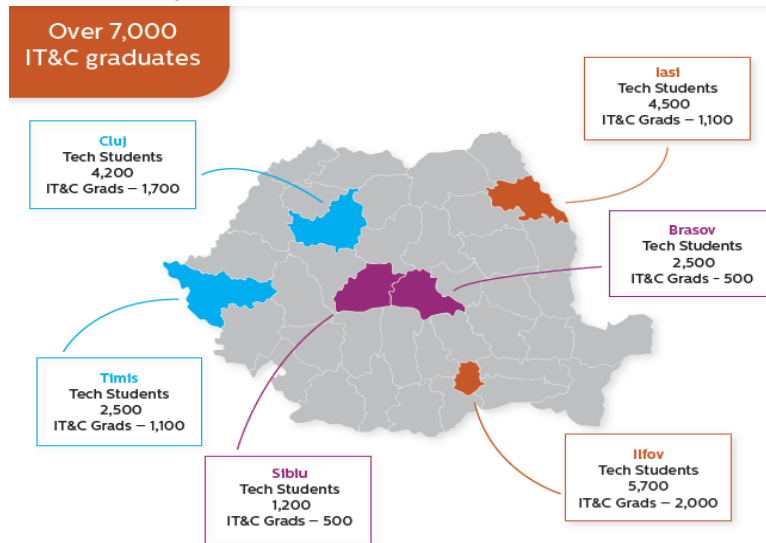
According to a Brainspotting report (2015), in 2015, **40% of the students** graduated in **technical fields** and **10% in ICT**. The **North East** is the **second pool of graduates for technical studies** and the **third for ICT graduates at national level**.

Representatives of the ICT firms interviewed confirm that the **presence of graduates with bachelor's degrees in STEM subjects with good language competences** (i.e. English, French, etc), and in particular in **ICT**, not only represents a **strong feature of the region**, but also **one of the main reasons for locating their business** in the North-East region and, in particular, in Iasi.

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<sup>48</sup> According to the Romanian legislation, the number of students that universities can have is calculated based on their teaching capacity (e.g. number of university professors, number of study rooms, etc).

Figure 3.8: Technical and ICT graduates in Romania in 2015



Source: Brainspotting 2015

Interviewed actors pinpoint that the current **number of graduates** in both technical and ICT studies is **insufficient for sustaining the development potential of knowledge economy**, in particular in the ICT field, in the region. According to them, this has resulted in a **substantial increase in the wages of ICT staff**, which in the long run **risks undermining the competitive advantage of the region** compared to other countries.

In order **to attract more students**, all interviewed **ICT and STEM faculties** say that in the last years they have been organising several **advertising campaigns both at the regional and international levels** (Moldavia, Ukraine), which have resulted in an **increasing number of students and graduates**, especially from Moldavia. This is also one of the explanations for the relevant **increase in the percentage of foreign graduates with bachelor's degrees** that passed from 2.6% of the overall students in 2003 (compared to the 1.7% national average) to 5.7% (compared to the 3.2% national average) in 2013 (last data available)<sup>49</sup>.

Besides an increase in the number of graduates, in the analysed period the North-East region has also registered a **decrease in early school leavers**, falling from 29% in 2000 to 25.3% in 2015. However, further efforts are needed to reach the European (11%) or Romanian (19%) levels.

### 3.5 Institutional characteristics of the area in relation to the KE and skilled migration

Romania is a centralised state. The central government is in charge of developing and implementing policies in **different areas, including also knowledge economy**. In the analysed period, the **Romanian national institutional structure has undergone several modifications** due to frequent changes of governments (11 since 2000). This has brought

<sup>49</sup> Romanian National Statistics Institute, <http://statistici.insse.ro>

about frequent **reorganisations of ministries and of responsibilities** in areas related to **knowledge economy**.

Currently, competences in knowledge economy **sectors are fragmented, divided among the following ministries:**

- Ministry of Public Finance in charge of fiscal policies (i.e. labour tax exemptions for ICT and R&D workers; etc);
- Ministry of Economics in charge of the economic and competitiveness policy of Romania;
- Ministry of Business Environment, Commerce and Entrepreneurship in charge of SMEs policies, business environment development, foreign investments and entrepreneurship;
- Ministry of National Education in charge of education and training policies. However, it is worth recalling that Universities have a certain degree of autonomy and can establish their own policies of development and cooperation with businesses;
- Ministry of Research and Innovation is in charge of scientific research, technological development and innovation policies (i.e. Research, Technological Development and Innovation Plan);
- Ministry of Communication and Information society in charge of digital agenda and ICT policies (i.e. ESIF policies in the ICT field);
- Ministry of Regional Development, Public Administration and European funds in charge of regional development policies and the coordination of all ESF and ERDF programmes. ESIF investment priorities are established at national level by the Ministry of Regional Development.

Even though most of the knowledge economy policies are decided at the national level, it is worth recalling that, the implementation of part of the **ROP and Competitiveness programmes** is carried out jointly with **Regional Development Agencies** (i.e. the North-East regional development agency), which are **intermediary bodies**. Regional Development Agencies, corresponding to the NUTs III level, were created in 1998, through the voluntary association of existing counties, in order to ensure the achievement of the regional development objectives. Besides being an intermediary for part of the ESIF measures, the **North-East Regional Development Agency** is also in charge of **developing and coordinating the 2014-2020 Regional Smart Specialisation strategy**. In order to ensure an effective implementation of the Strategy, the *Regional Council for Innovation*, made of public bodies, universities and representatives of businesses, was created in 2017.

**Local authorities**, such as County Councils, Local Councils and Municipalities are **in charge of** the following: **developing local social, economic and urban development strategies and projects** under the national policy framework; **local and county transport infrastructure** (i.e.



local and county roads, airports, etc); coordination of public services in the area of education, health, transport infrastructure, culture, etc; culture; local security and safety and taxes collection. Local authorities **support knowledge economy** through: i) the **development of specific strategies and projects within ESIF and international funds** (i.e. Technology Transfer Centre Tehnopolis – business incubator and technological transfer centre – created by the Municipality and Local Council of Iasi; H2020 Strategy of the Municipality of Iasi; 2009-2015 and 2015-2030 Integrated Urban Development Plan of Iasi, etc); ii) the **creation of premises for knowledge economy development** (i.e. land management policies, etc).

At the local level, **universities** play a relevant role in incentivising knowledge economy development and migration flows through their **strategies for incentivising cooperation with private companies** to better adapt graduates' competencies to the demands of the labour market. To this end, it is worth recalling that all **universities/faculties in the STEM areas** (i.e. ICT, engineering, etc) include **cooperation with private companies** as one of their main development objectives. According to case study interviews, public universities in the region have specific cooperation agreements with private companies both at the local and regional levels. Cooperation occurs mainly in the teaching area (i.e. internships, curricula development) and to some extent in the research and technological transfer area (Mironov C., 2016; Toliaş Y., 2017). However, **national or ESIF programmes mainly drive cooperation** in this latter area. On the contrary, **cooperation in the teaching area occurs both on an autonomous basis** (enhanced by private companies) and **within national and ESIF programmes**. To this end, it is worth mentioning a policy of the Faculty of ICT at the University of Iasi, involving ICT professionals in teaching in order to overcome the shortage of professors in this area and ensure the development of competencies adapted to the necessities of the labour market.

**Migration policy** in Romania is coordinated by the Ministry of Internal Affairs in collaboration with the Ministry of Labour and Social Justice, which is in charge of approving work permit quotas for foreign citizens intending to enter the Romanian labour market. The Department for Romanians abroad, created in 2001, is in charge of developing and implementing policies targeted at the Romanian diaspora.

## 4 Policy features affecting the performance in relation to the knowledge economy and high-skilled migration flows

Policies intended to enhance knowledge economy development and reverse brain drain are mainly implemented at the national level.

At the regional level, the main policy relevant for the present study is the **Smart Specialisation Strategy (SSS)**. The SSS of the North-East region aims to develop the innovative competencies of future generations; support innovative enterprises in the North-East region; incentivise existing and future clusters as the pillar of the innovative system in the region (Mironov, 2016). The main sectors included in the strategy are ICT; biotechnology, especially in the medical field; agro-food (i.e. food science, nano-materials, soil research, etc.); textile and clothing (biomaterials, medical textiles, functional textiles, etc.) However, it is worth recalling that the **Smart Specialisation Strategy does not have the benefit of its own budget**, but is financed within the **Competitiveness OP**.

The following paragraphs provide an overview of the main policies supporting the development of knowledge economy in the North-East region.

### 4.1 Policies supporting knowledge economy through urban development

In the period 2007-2013, the *Regional Operational programme*<sup>50</sup> sustained urban development through the specific axis<sup>51</sup> “*Integrated urban development*” that provided funding for the improvement of urban infrastructures and services, including public transport; development of businesses and business support structures; and improvement of social services and infrastructures. Within this axis, 7 growth poles were funded with the aim to create a magnet. The municipality of Iasi is one of the growth poles financed within the 2007-2013 ROP. The 2009-2015 Integrated Urban Development Plan of Iasi city includes 85 projects with the following aims:

- Increase economic competitiveness through the creation of business support structures, technological transfer and the promotion of new and creative industries;
- Improve transport infrastructure and social infrastructure to increase people's living standards;
- Value the cultural and historical heritage for developing the tourist potential of the city;

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<sup>50</sup> “Operational programmes (OP) are detailed plans in which the Member States set out how money from the European Structural and Investment Funds (ESIF) will be spent during the programming period. They can be drawn up for a specific region or a country-wide thematic goal (e.g. Environment, regional development, etc).”, European Commission, [http://ec.europa.eu/regional\\_policy/en/policy/what/glossary/o/operational-programme](http://ec.europa.eu/regional_policy/en/policy/what/glossary/o/operational-programme)

<sup>51</sup> OPs are broken down into priority axes (financing blocks). A priority axis concerns one fund, corresponds to a thematic objective and comprises one or more investment priorities (measures) of that thematic objective.

- Improve the quality of the urban environment to increase the attractiveness of the city and living standards for inhabitants;
- Promote territorial and transnational cooperation.

The plan integrates ROP funding with funds from other ESIF programmes (i.e. ESF POSDRU; Competitiveness OP; Environment OP; EARDF; South-East Europe OP, etc.), PHARE, local and state budget and from private sources.

The Integrated Urban Development Strategy of the Municipality of Iasi has been updated in the context of the 2014-2020 ROP, which supports urban development of all county capitals through investments in education and training infrastructure; sustainable urban mobility and reduction of carbon emissions; urban regeneration and urban environmental quality and physical, social and economic development targeting disadvantaged communities in urban areas.

The 2015-2020 Integrated Urban Development Strategy of Iasi's metropolitan area aims to turn Iasi into a knowledge economy regional pole. The strategic objectives of the 2015-2020 Integrated Urban Development Strategy are the following:

- Enhancing the development of strategic economic fields as ICT;
- Increasing cooperation between research institutes and firms;
- Increasing the attractiveness of the metropolitan area for investors and people;
- Enhancing the development of creative industries and of the cultural offer;
- Improving connectivity and sustainable mobility;
- Supporting urban regeneration;
- Improving social and education infrastructure and services;
- Increasing the quality of the urban environment.

The plan includes over 1,000 projects that translate these objectives into practice.

## **4.2 Policies providing incentives to persons, people and research centres**

In Romania, there are several financial and fiscal incentives offered to persons (i.e. researchers), employers and employees (i.e. ICT and R&D employees and employers) and research centres.

The most relevant are as follows:

- Grants to researchers, universities and/or research centres to support research development and companies for clusterisation, technological transfer, innovation

Grants to researchers, universities and/or research centres to support research development are offered within the National Research, Development and Innovation Plans (2007-2013;

2015-2020), the Competitiveness OP (2007-2013; 2014-2020) and the ESF Human Capital programme (2007-2013; 2014-2020) aim to: i) incentivise research and innovation; ii) develop research infrastructure; iii) increase the number of researchers; iv) facilitate transition from tertiary education to the labour market, especially in the Smart Specialisation fields.

Some examples of measures financed are PhD and post doc courses; financial support to researchers and research centres/groups with outstanding performances; scholarships for junior researchers; support for researchers' and research centres' participation in international research projects; awards for excellent results in research and innovation; development/improvement of research infrastructure; internships and traineeships.

The National Research, Development and Innovation Plans (2007-2013; 2015-2020), the Competitiveness OP (2007-2013; 2014-2020) and the *2014-2020 Regional Operational programme (ROP)* offer grants for enhancing collaboration between research structures and businesses in order to increase innovation demand and the uptake of innovations on the market as well as to support economic competitiveness in specific fields (i.e. ICT, biotechnologies, nanotechnologies, health, etc).

Some examples of measures financed are the following: creation of clusters, technological parks and excellence poles; creation of start-ups and spin-offs; research projects supporting knowledge and technological transfer from universities/research centres to companies; industrial and experimental research projects; patents; process or product innovation projects; development of the research infrastructure of companies.

- Financial and fiscal incentives for incentivising employment in ICT and R&D and reversing brain drain in these areas

The national state aid scheme for the IT sector adopted in 2012 offers financial incentives for the creation of large businesses in the IT sector. According to the scheme, funded firms have to create at least 200 working places 3 years after the implementation of the scheme. Under the terms of the scheme, firms are obliged to maintain jobs at least 5 years after its implementation.

Fiscal incentives in the ICT and R&D fields consist in:

- 0% income tax for employees in the ICT sector. The income tax deduction is available for software engineers/programmers/software analysts with an annual revenue of over 10,000 USD.
- 0% income tax for employees in R&D and for companies in this area for the next 10 years;

- 0% tax on profit reinvested into new technological equipment used for business purposes<sup>52</sup>.

According to the European Commission (2014) fiscal incentives for R&D in Romania are among the most generous in OECD countries.

In 2017, Romania also registered the lowest level of total tax burden as a % of GDP in the EU: 25% in RO compared to the 40% EU average (European Commission, 2017). The rates are 16% income corporate<sup>53</sup> and employees' taxes; 5% dividend tax rate.

### 4.3 Policies exploiting the diaspora potential: The Diaspora Start-Up programme

The **investment potential of the Romanian diaspora** has recently entered the public policy agenda of Romanian authorities. Within the **2014-2020 Human Resources programme**, a **specific measure is dedicated to attracting investments from emigrant Romanian entrepreneurs**: the **Diaspora Start-Up programme**. The *diaspora start-up programme*, launched in 2016 and managed by the Romanian Ministry of External Affairs, aims to incentivise Romanian entrepreneurs abroad to invest in Romania. The programme targets **all Romanian regions, except for Bucharest-Ilfov**. The programme receives 30,000,000 euro from the 2014-2020 ESF resources. It finances the **creation of innovative and non-agricultural enterprises in urban areas** of Romania. It targets Romanian people who have lived abroad for at least 1 year in the last 3 years, and who have previous entrepreneurial experience abroad, specific work experience and professional training in the area of investment. Both entrepreneur and created enterprise have to be based in Romania to qualify.

The expected results of the programme are 3,000 trained people in 2017; 300 small and medium enterprises created in 2017; and over 600 new jobs created in 2018.

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<sup>52</sup> ADR Nord-Est (2017) Investor's Guide 2017. Invest in North-East Romania, [http://www.adrnordest.ro/user/file/news/16/Brosura%20ADR\\_A4\\_2017\\_%20WEB%20landscape.pdf](http://www.adrnordest.ro/user/file/news/16/Brosura%20ADR_A4_2017_%20WEB%20landscape.pdf).

<sup>53</sup> "Corporate income tax ("CIT") is chargeable at a flat rate of 16% and is applicable on worldwide income, in the case of resident entities or on the earnings in Romania, in the case of non-resident companies. In this respect, in the category of taxpayers who are required to declare and pay CIT according to Romanian law are now included non-resident entities which have the place of effective management in Romania. In an attempt to stimulate the business environment, the general deductibility rule has been redefined as to cover a larger base. Thus, as of 1 January 2016, expenses are deductible for CIT purposes provided they are incurred with the purpose of conducting economic activities", ADR Nord-Est (2017) Investor's Guide 2017. Invest in North-East Romania, [http://www.adrnordest.ro/user/file/news/16/Brosura%20ADR\\_A4\\_2017\\_%20WEB%20landscape.pdf](http://www.adrnordest.ro/user/file/news/16/Brosura%20ADR_A4_2017_%20WEB%20landscape.pdf).

## 5 Testing the evidence: Main results achieved and shortcomings

The results achieved by the various policy tools adopted to support knowledge economy are characterised by positives and negatives:

- In the period 2000-2015, the **North-East region registered a significant increase in knowledge economy**, driven by public policies, especially in ICT (e.g. financial and fiscal incentives), and conditions on the ground (i.e. quality of human capital in the STEM fields):
  - +4% of local active units in the ICT sector; +18% in education and +24% in health and social assistance;
  - +136% in the turnover of health businesses, +79% of ICT ones and +45% of those in technical and scientific professions;
  - +45% of employees in R&D per 10,000 civil employees, etc.

However, **most of the knowledge economy growth is concentrated in Iasi county** (i.e. 41% of local units in knowledge economy and half of the ICT local active units; +82% of employees in R&D per 10,000 civil employees; 0.70% of GDP investments in R&D compared to 0.29% at regional level, etc), and especially in Iasi municipality. As confirmed by interviews, the concentration of knowledge economy in Iasi is mainly due to better connectivity, social, environmental and business infrastructure in the context of the ESIF OPs, as well as a higher pool of graduates in STEM compared with other NE counties. **An increase in the quality of life and work opportunities**, including in the knowledge economy sector, has also **attracted people in Iasi county**, and especially in Iasi municipality: there was a 0.5 difference in the migration crude rate between 2000 and 2015, the only positive rate in the region. As underlined by the World Bank (2017), **ESIF policies for the development of urban growth poles have managed to create economic and social growth in those poles (i.e. Iasi)**; however, **no spillover effects have been registered in the rest of the region**.

- In the analysed period, there has been an **improvement in collaboration between universities/research centres** (i.e. a 24% increase in research agreements between universities and firms between 2014 and 2016) and firms, in the context of national and ESIF grants for incentivising clusterisation, knowledge transfer and industrial research. However, **the effect of research on the real economy is uncertain** (European Commission, 2014; Tolias 2017). While collaboration seems to have increased between universities and firms, favoured by clusters and knowledge transfer centres, this has hardly translated into new products for the market, mainly due to shortages in

spin-offs<sup>54</sup> and industrial property legislation. On the other hand, **increased collaboration between universities and firms seems to have triggered higher employment for graduates**, especially in some STEM fields (e.g. ICT).

- In the analysed period, over **15,000 PhDs and post docs have been financed at the national level**<sup>55</sup> (Curaj A., 2015) by national and ESIF funds. However, this **has barely resulted in any extra employment for universities/public research centres**, due to low attractiveness of university careers compared to the private sector, especially in knowledge economy sectors (i.e. ICT, engineering). Yet, interviews emphasise that in areas with **a less developed private knowledge economy sector** (i.e. Suceava), **grants for researchers and PhDs have contributed to maintaining talents in the university and county**. Furthermore, **in the absence of these grants, losses in research and teaching staff would have been even higher** (according to interviews with university actors in the North-East region).
- **Fiscal and financial incentives** have contributed to the **development of the ICT sector** in the region and, hence, to a higher retention of qualified workers.

This is also the case with policies addressing the diaspora. While the diaspora start-up has the potentialities to encourage Romanian emigrants to return home, it is not clear how much it will manage to attract back those active in knowledge economy sectors.

The paragraphs below analyse in detail the outcomes of the various policy tools.

## **5.1 Policies supporting knowledge economy through urban development**

Of the 85 projects, included in the 2009-2015 Integrated Urban Development Plan of the Municipality of Iasi, drafted within the 2007-2013 ROP, 58 have been finalised and 2 are ongoing, while 14 will be implemented in the current programming period. 7 have been rejected and 4 cancelled. Projects implemented relate almost exclusively to Iasi city and most of **them (84%) focus on improvement in transport infrastructure** to/from and within the city and on **improvement in the quality of the urban environment** to increase the city's attractiveness and the living standards of its inhabitants. The remaining **16%** focuses on improvement in social (4% of the funded projects), **cultural** (9%) and **business** (3%) **infrastructure and services**<sup>56</sup>. Most of the **business infrastructure** created consists in **the creation of centres for business support and development and technological development**. There are 5 such centres (i.e. Centru Regional Tehnologic Iasi, Ideo Iasi, Sorana Iasi, etc) funded by the 2007-2013 ROP in

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<sup>54</sup> "Research-based spin-offs are generally understood to be small, new technology-based firms whose intellectual capital originated in universities or other public research organisations", OECD, <http://www.oecd.org/sti/sci-tech/introductionthenewspinonspin-offs.htm>

<sup>55</sup> No consolidated data available at regional level

<sup>56</sup> Municipality of Iasi, 2015-2030 Integrated Urban Development Strategy, <http://www.primaria-iasi.ro/portal-primaria-municipiului-iasi/strategia-integrata-de-dezvoltare-urbana-a-municipiului-iasi-2015-2030-campanie-de-consultare-publica-organizata-de-municipiul-iasi/2122/strategie-si-proiecte-europene>

Iasi. Most of them offer **modern building offices at an advantageous renting price** and administrative support services, while business consultancy services remain rather underdeveloped. **Their degree of occupation ranges from 80% to 100%.** However, most of them are occupied by multinationals (i.e. Centrul Regional Technologic Iasi rented by Continental, one of the biggest firms in the automotive sector in Romania), which has the effect of crowding out start-ups<sup>57</sup>.

According to the evaluation of the Integrated Urban Development Axis of the 2007-2013 ROP (Ministry of Regional Development and Public Administration, 2015), **funded cities, including also Iasi**, have **improved their urban transport, social, environmental and cultural infrastructure**, which has **contributed to increasing their attractiveness for both people and investors** and to **creating the pre-conditions for the economic development** of cities. This is also confirmed by interviews with business actors: *“the improved air connections and airport were relevant conditions for selecting Iasi for a branch in the North-East region. However, improvements in air connections are still needed so that Iasi can be able to fully compete with Bucharest and Cluj. Furthermore, employees do not look only at the professional career opportunities, but also at leisure and social life opportunities. Iasi offers now several opportunities for spending one’s free time.”* (interviewed actor): *“he has selected Iasi also because the airport is ok, as it has been improving a lot in the last years and as there are nice areas and buildings for opening an office”* (interviewed actor): *“...we could find here a developed telecommunications infrastructure, an airport and good road connections, and office buildings enabling us to offer high quality work environment to our colleagues”* (interview to Oracle country leader in Investors’ Guide of North-East Region, 2017).

Iasi hosts now 41% of the knowledge economy businesses and half of those in ICT in the North-East region, registering higher levels of employment in these sectors than the regional ones and, even, the national ones in the case of ICT (see chapter 3). Furthermore, the analysed period has also registered a growth in GDP higher than the national one (see chapter 3).

**Improvement in the attractiveness of the city coupled with the increased quality of job opportunities**, especially in the ICT sector, has **contributed to attracting new people to the region**: *“not only has Iasi managed to maintain the working force, but it has also attracted new persons in the city, especially youth. The ICT firms have publicised a lot Iasi city and opportunities offered both by the sector and the city. Some people in the ICT sector came back and people from other cities in the region or other regions moved to Iasi”* (interviewed actor). “According to the World Bank survey (2017), Iasi is the sixth city in Romania where respondents would like to move. The **quality of life** and **job opportunities** are the **main reasons for choosing Iasi** as a **potential internal emigration destination** (World Bank, 2017). As pointed

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<sup>57</sup><http://www.ziarulevenimentul.ro/stiri/dosar/centre-de-afaceri-pentru-dezvoltarea-iasului--160029.html>



out in chapter 3.2.2, Iasi has become a place of internal migration while also maintaining the lowest emigration rates in the region. The evaluation of the 2007-2013 ROP (Ministry of Regional Development and Public Administration, 2015) also confirms this.

## **5.2 Policies providing incentives to persons, people and research centres**

**Grants to researchers, universities and/or research centres to support research development and companies for clusterisation, technological transfer, innovation**

Between 2007 and 2015, **785 projects offering grants for incentivising research infrastructures and/or collaboration between research centres and businesses** (620 projects) and **human capital development for research** (165 doctoral and postdoctoral projects) were financed by the ESF and ERDF Economic Competitiveness OP at the national level (Curaj A., 2015). To this, around **12,000 projects were added**, funded within the **National Research, Development and Innovation Plan** (UEFSCDI 20011-2015 annual reports).

Some of the main results of ESIF projects for human capital development obtained at the national level include: **7,798 PhD students supported**, of whom 45% obtained the PhD diploma by 2015; **2,723 postdoctoral researchers assisted**; 27,306 doctoral and postdoctoral scientific papers/reports presented; 28,822 doctoral and postdoctoral scientific papers/reports published and 221 transnational partners involved in the projects (Curaj A., 2015).

As to their geographical **distribution**, **three clusters** emerge: Bucharest, Cluj and **Iasi in the North-East region**.

**Iasi is also one of the three areas with the highest number of projects supporting human capital for research development within the National Research, Development and Innovation Plan (RDI)**: i.e. 358 projects in 2016 (UEFSCDI, 2016). For instance, in 2016 the University of Iasi registered 104 projects for PhDs and postdoctoral researchers financed within the PNCDI, most of whom from the fields of physics and mathematics. The University of Medicine from Iasi passed from 38 projects submitted to national competitions within the Plan to 51 in 2016. In the North-East region, **Suceava scores second in this area**, with 22-42 projects funded in this area within the plan.

While investment in human capital has certainly **supported the increase in the quality of human resources available**, this **has not always resulted in the consolidation of research and teaching capacities of universities**: “researchers in university did not grasp; they applied in a fragmented manner, strictly for fellowships, without forming institutional collaborations, clustering into interdisciplinary groups and exploiting research infrastructures” (Curaj A., 2015). One can note, in fact, that the number of teaching staff in North-East universities has decreased by 19% in the North-East region.

There are two main reasons explaining this: first, **perception of opportunity at individual level**, as both the ESF POSDRU and the national RDI have focused on individual researchers and not on building capacity at university level; second, **universities have not employed PhD**

**graduates due to the unreliability of R&D funds** (Curaj A., 2015). In the **ICT sector, the lack of attractiveness of the university career** adds to this. As some interviewed actors pinpoint *“in STEM, and especially ICT sectors, is very difficult to attract PhD students/researchers due to the hunger wage, since they can obtain a very high salary in the private sector. Once that they have a job in the private sector, they will never come back to universities”* (interviewed actor in ICT from Iasi); *“The competition with the private sector has resulted in a reduction in the number of researchers and professors. Universities cannot compete with firms due to the high wage difference. Now losses have stopped as there is nobody else that can leave. There are very few young researchers, as most of them go to work directly in the private sector after graduation”* (interviewed actor).

However, **all interviewed actors from universities** in the North-East region, especially from ICT, **emphasise that in the absence of these grants universities would have registered even higher losses in research and teaching staff**. In the actors' view, these grants have managed to support the attraction/retention of those few researchers wishing to stay in universities. Interviewed actors maintain that this **contribution is even higher in those areas** (i.e. Suceava) where **the private R&D and ICT/scientific and technical fields are less developed**. Suceava is, in fact, the only North-East county that has registered a 22% increase in teaching staff in the analysed period.

Besides grants for researchers, the 2007-2013 Operational Programme for the Development of Human Resources (POSDRU) and the 2014-2020 POC have also **provided grants to support students as they transition from university to the labour market**. Universities in the North-East have undertaken several projects in this area. For instance, the **Technical University of Iasi implemented 12 projects in this area** and the **University Vasile Alecsandri 11**, focused in the **STEM** (i.e. ICT) areas. Even though there are **no quantitative data at the regional level** on the number of students employed after the internships, **interviewed actors emphasised that grants in these area have contributed to the adaptation of students' skills to the demands of the labour market**. However, it is worth stressing that the **increased effort to tailor students' skills to the labour market has also been triggered by the autonomous cooperation between universities and faculties, especially in the ICT field**. For instance, the ICT faculty of the University of Iasi has given private companies (i.e. Bitdefender, Continental, Amazon, Centric, etc) the possibility to teach optional classes to students based on their needs. These classes are financed directly by companies. The increase in the adaptation of students' skills to the labour market, in particular in ICT (Mironov, 2016) has also **contributed to improving their employability** (case study interviews). For instance, in the Technical University of Iasi 90% of the students who graduated in IT in 2015 have found a job within one year of graduating, compared to 80.2% of graduates in Electric and Energy Engineering, 77.6% in Car Design and Industrial Management and 61.8% in Electronics, Telecommunication and Information Technology (University Gheorghe Asachi, 2016). Interviewed actors confirmed that **cooperation in teaching is mainly due to a mutual perception of opportunity**: an increased number of cooperation agreements in the

teaching area (i.e. internships) coupled with a high level of student employment increases the reputation of universities and contributes to attracting more students; also, firms can have access to talented human capital that they can “raise” according to the needs of the company.

Grants for clusterisation and technological transfer implemented in partnerships between universities/R&D centres and businesses have been awarded to **41 projects** in the period 2007-2015 at the national level. To this over **351 projects** of cooperation between universities and firms have been added in 2016 alone, funded by the **national RDI III**.

Unlike the grants for supporting human capital, which have exceeded the programme target, **the grants for clusterisation and technological transfer are far below the national target** (200 projects).

Difficulties in fostering cooperation between private businesses and enterprises are confirmed by both case study interviews and the self-evaluation undertaken by North-East Universities (Mironov, 2016). Interviews reveal that difficulties are due to the fact that knowledge transfer projects have high costs that companies, especially SMEs, cannot meet. In addition, market opportunities for knowledge transfers are not perceived.

Interviewed actors pinpoint that ESIF and national **grants for partnerships in the R&D and innovation area have contributed to pushing companies and universities to work together and to identify mutual opportunities**: *“the university supports the businesses in the county to participate together in national RDI and ESIF competitions for enhancing knowledge transfer and innovation. Cooperation projects between universities and companies funded by the RDI Plan passed from 14 in 2015 to 33 in 2016”* (interviewed actor). ESIF and RDI investments in R&D and technological transfer partnerships between universities and companies exceed those from companies’ own sources, i.e., over 10,000,000 RON from ESIF and RDI compared to 883,522 from companies’ own sources in the case of the Technical University G. Asachi from Iasi (G. Asachi University, 2016).

It’s worth noting, in fact, that, after Bucharest-Ilfov, the **North-East region registers the highest number of ESIF-funded projects in this area** (68 projects). **Iasi has been leading the cooperation between universities and companies**, followed by Suceava (Curaj A., 2015, UEFSCDI, 2016).

According to case study interviews, **clusters** created/supported within the ESIF funds **offer a structured platform for cooperation**: *“Euronest cluster has proved essential for the development of research and internships/traineeships projects. In the past several projects have been won by the cluster”* (interviewed actor); *“clusters have favoured a dialogue between firms and universities. It is important to have a formal collaboration structure. The dialogue between firms and universities, but also among universities, has resulted in new projects especially in the context of the ESIF and national RDI funds. Furthermore, they have also increased their cooperation with companies for internships for their students”* (interviewed actor); *“interactions between and among companies and universities have fostered mutual*

*trust. In Romania, people do not trust each other. They are afraid that someone will steal their ideas. We needed a place where people can exchange ideas and learn to trust each other. In addition, clusters have allowed SMEs to get in touch with big universities, as the Iasi ones.*" (interviewed actor).

However, interviewed actors emphasise that **not all clusters are as active as they would like**. This is **due especially to the weak administrative structure**. In some cases, clusters have only one full-time employee, which reduces their capacity to offer support services to their members and, thus, attract other members. The weak administrative structure is a problem especially for small clusters that cannot charge their members with high participation fees. It's worth noting that clusters benefit from **public funds only in** the context of ESIF and national **grants that have a limited duration**.

In the North-East region, 4 clusters are active in knowledge economy (case study interviews and Municipality of Iasi, 2015):

- Imago-Mol (health and medical sciences): created in 2012; from 5 members at the beginning to 25 currently; 5 at the beginning; 780,000 euro annual turnover;
- Iconic Cluster (informatics and communication technology and new media): created in 2012; from 7 members at the beginning to 30 currently; 1,000,000 euro annual turnover;
- Euronest ITC Cluster (ITC- outsourcing, software development, e-commerce, etc): created in 2013; 21 members; 21,600,000 euro annual turnover
- Biorone Cluster (biotechnologies, nanotechnologies and micro technologies): created in 2011; 13 members; 72,000,000 euro annual turnover.

To this Tehnopolis scientific and technological transfer park adds. Tehnopolis is a joint venture between the Municipality of Iasi, the County Council of Iasi and four STEM universities of Iasi. It was created in 2005 within a Phare project and supported afterwards through projects funded by the Competitiveness OP. It offers the following services: legal, accounting, administrative and business consultancy; knowledge brokerage, coaching/mentoring, needs assessments and innovation audits; promotion of internationalisation; facilities for firms entering the park, and especially SMEs (i.e. reduced renting, VAT exemption for buildings in the park, etc). It is also the contact point of Enterprise Europe Network. Currently, **95% of the park is occupied by firms**. Between 2014 and 2016, Tehnopolis contributed to the **establishment of 16 start-ups** and to the **incubation of 7 new firms** and **provided hosting services to 20 companies** and **other services to over 60 companies** (Tolias, 2017).

A recent survey (Tolias, 2017), filled in by 8 universities/R&D public institutions in the North-East region, shows that between 2014 and 2016 surveyed universities/R&D signed: **195 research agreements**, of which 96% with firms in the region; **93 collaborative research**

**agreements**, of which 93% with firms in the region; **101 contract research agreements** (100% with firms in the region). In addition, **136 consultancy agreements** were signed.

According to case study interviews **RDI funds**, coupled with legislative measures on researchers' evaluation, **have contributed to enhancing patenting** in the North-East region. In 2013 (last data available), the **number of patent** applications/million inhabitants to the national Romanian office **was higher in the North-East** (55.05) compared to the **national average** (50.07) (Tolias Y., 2017). However, the number of applications to EPO was far lower in North-East (1.5) compared to the national average (3.0) and the EU one (112,3). According to Tolias (2017), this shows that patenting is not undertaken for securing the intellectual property rights on the international market, but rather for increasing the reputation of holding a patent. In fact, between 2014 and 2016 surveyed R&D centres executed no license.

The **lack of income from licenses** and **from spin offs** show that R&D partnerships **had very limited effects on the regional economy** (Tolias Y., 2017).

Several studies (Tolias Y., 2017; Curaj A., 2015; World Bank, 2012) show that the **IPR legal framework has disincentivised companies from turning R&D and innovations into marketable products**. According to these studies, the vague IPR legal framework has created mistrust within companies and research institutions due to potential conflicts over the ownership of research results. This holds true in particular for multinationals that prefer carrying R&D activities in their origin country in order to avoid time consuming lawsuits (World Bank, 2012).

Furthermore, private entities interested in the commercialisation of R&D results (i.e. patents) have a **limited time-frame to value their market value and sustainability** as after 5 years all patents are available to the public for free.

**2007-2013 ESIF grants for innovation in companies** were allocated to companies from the North-East region between 2007 and 2015. While the **region registers a higher level of innovative enterprises** (14.4% between 2012 and 2014) than **the national average** (12.8%)<sup>58</sup>, **the contribution of ESIF grants** to innovation in enterprises **remains unclear**.

According to case study interviews, **financial and fiscal incentives in ICT and R&D** have **contributed to the development of the ICT sector in the North-East region**: *"income tax exemption for ICT staff, coupled with lower wages in the North-East region than in other areas, has contributed to attracting enterprises in the region (interviewed actor)"; "income tax exemption for ICT employees is the only public policy that has contributed to attracting ICT investors."* (interviewed actor); *"fiscal policy in the ICT field has been an effective policy for developing the ICT sector and retaining a specific type of workforce that brings added value to the economy."* (interviewed actor); *"even though access to well-qualified and low cost human*

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<sup>58</sup> Author's elaboration on INSSE data

*capital has been the main drive for coming in North-East, the fiscal policy in the ICT sector has been a happy side effect considered in the selection of the location” (interviewed actor).*

In the analysed period, multinational companies (i.e. NESS Technologies, NTT Data, Endava, SCC Services, etc) have created **over 800 jobs in the ICT sector within state aid measures. Most of them** have been created in Iasi. Interviewed entrepreneurs said that **the number of jobs created would have been lower in the absence of financial incentives.**

According to case study interviews, the increase in job opportunities as well as in working conditions and salaries have contributed to limiting brain drain in the ICT sector: *“in the ITC sector, there has been a reduction in the number of those wishing to emigrate. This is explained by the increase in qualitative job opportunities, namely high working conditions and salaries.” (interviewed actors): “many people in the ICT sector do not emigrate anymore as people can make the same amounts of money as in other states and do not pay income taxes” (interviewed actors).*

### **5.3 Policies exploiting the diaspora potential: The Diaspora Start-Up programme**

The programme has undergone several delays due to overall delays in the implementation of the 2014-2020 ESF Human Capital programme that funds it. 32 projects amounting to over 76 million lei have just been approved within the Diaspora Start-Up programme. Most of the selected projects target Romanian emigrants from Italy, Greece and Spain. Most of the **interviews** with associations participating/interested in the programme reveal that **there is a high demand from Romanian emigrants for support to open businesses in Romania.** The pre-existence of a potential demand certainly contributes to the success of the programme in attracting investors. However, the capacity of the programme to attract emigrant investors in knowledge economy is unclear. While the design features of the programme (i.e. selection criteria) specifically target investments in KE, case study interviews show that the pre-existent demand for business support comes mainly from Romanians active in sectors with low added value (i.e. constructions, agriculture, etc).



## 6 Conclusions and lessons learnt for Cohesion Policy

In the analysed period, knowledge economy local active units, turnover, investments and employees have increased considerably in the North-East region, in particular in the ICT sector. Several multinational companies in the ICT and related areas (i.e. NTT Data, Continental, Endava, SCC Services, Oracle, etc) have opened a branch in the North-East region in the considered period. However, most of them are active in outsourcing and they hardly undertake any R&D activities in Romania (World Bank, 2012; Curaj A, 2015) that implies a low added value of the sector to the region's economic competitiveness.

Contextual factors, such as the well-qualified human capital in STEM (i.e. ICT, mathematics, etc), the existence of several STEM universities prone to collaborations with the private sector, and the lower level of wages than in other EU countries and Romanian regions, have been essential for growth in knowledge economy in the North-East region and, more generally, in Romania. Indeed, as emphasised by the World Bank "Magnet city report" (2017), it is easier to sustain economic growth when equipped with a high level of human capital and universities that provide companies with human resources qualified and adapted to the demands of the labour market. However, Romanian and North-East authorities should pay attention to the fact that a reduction in the quantity and quality of human resources in the ICT sector coupled with an increase in wages could put the development of the sector at risk.

In addition, general (i.e. low and flat corporate income taxes, low dividend taxes, etc) and specific fiscal policies for knowledge economy (i.e. income exemptions for employees in ICT) have also proven to be relevant for triggering ICT investments in Romania. Furthermore, financial incentives for job creation in the ICT sector delivered through specific state aid measures have also been valued by large investors (i.e. multinationals) in the ICT sector.

Growth in the North-East region has been concentrated in the county, and especially in the municipality of Iasi. This is mainly due to the improvement in the airport infrastructure and in the environmental, social and cultural infrastructure and to the existence of modern building offices with low renting prices. Improvement in transport, business and living infrastructure has been driven mainly by the ERDF-funded Integrated Urban Development Strategy of Iasi.

Even though there are no quantitative data, case study interviews reveal that the increase in qualitative job opportunities in the ICT sector and in living conditions in Iasi have contributed to retaining and to attracting human resources in the ICT sector in Iasi. Iasi is one of the most attractive cities in Romania, especially due to its living conditions and job opportunities (World Bank, 2017).

In order to fully exploit the potential of the Romanian sector, especially in the knowledge economy sector, the Romanian authorities have recently adopted the ESF funded Diaspora Start-Up programme. The implementation of the programme has undergone several delays and no results are available at the moment.





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Eelco Vissinga, Ex CEO CENTRIC IASI and current CEO BPM Romania

## ANNEXES

### Annex 1 Public universities in the North-East Region

#### Public universities in North-East

*Alexandru Ioan Cuza University of Iasi* – created in 1860; the **major university in North-East**, in terms of students enrolled (23,132 students enrolled in 2016/17) well recognized at national level. It includes 15 faculties covering a wide range of subjects in scientific and technical areas (i.e. computer science, mathematics, chemistry, cybernetics, economics, etc). It **offers transdisciplinary courses** (i.e. ICT-medicine –arts-engineering) and is very active in the **collaboration with private enterprises**, being part of several clusters in the North-East Region. It also focuses on the development of students' entrepreneurial skills.

*Gheorghe Asachi Technical University (Iasi)* – **long tradition and history in the engineering, technical, scientific and cultural areas**. It includes 11 faculties covering different specialisations (i.e. Faculty of chemical engineering, Faculty of Automatic Control and Computer Engineering). Since 1994, it has been including a **Centre for Research and Technical Transfer, well-known among companies** (Mironov, 2016). It includes several **collaborations with private companies** and is part of several clusters in the North-East region.

*Grigore T.Popa University of Medicine and Pharmacy (Iasi)* – **leading university in the medical field** at national level due to its recognised **capacity of innovation and innovative products** in the field of medicine, oncology, genetics and nutrition and to its active collaboration with the business environment in this field. It is also the **first university in Romania having founded a cluster in the medical field**. It offers **transdisciplinary courses**, such as, for instance, arts therapy in collaboration with the Arts university of Iasi or biotechnology in collaboration with the ITC faculty of UAIC.

*Ion Ionescu de la Brad University of Agricultural Sciences and Veterinary Medicine (Iasi)* - one of the best-acknowledged universities at national level in this area. It focuses on **agricultural specialisations with a focus on updated technologies and innovative materials** in this field. It includes specialisations in organic culture, food safety, animal health, environmental and plants protection. It has a **Centre for Research-Innovation and Technological Transfer**. It offers **specific training on entrepreneurship** for all students.

*George Enescu University of Arts (Iasi)* – it focuses on **visual arts and design**, drama and music. It **collaborates** extensively with **local and regional administrations** as well as with the **business environment**. It offers specific training on entrepreneurship.

*Stefan cel Mare University (Suceava)* – in the last years, it has been the **first in the national ranks of universities for patents and requests for patents**. This is also due to the strong investments in its research facilities and to the fact that university professors are also researchers. It covers a **wide range of specialisations** (i.e. IT, medicine, food, etc) and offers compulsory and optional training in entrepreneurship for all students. It is part of clusters in the region and has **strong relations with the local business environment**.

*Vasile Alecsandri University (Bacau)* – the smallest public university in the Region. It is well known for its **technical programmes**, even if nowadays it covers a wide range of areas (i.e. IT, chemistry, etc). It focuses primarily on education and secondarily on research.

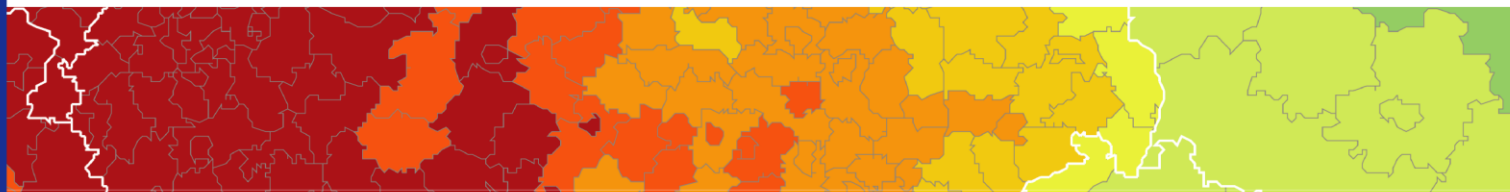
Source: Mironov, 2016



## Annex 2 Evolution of knowledge economy sectors in the North-East region between 2008\* and 2015

Dimension		Romania	North-East	Iasi
ICT local active units	Local active units: % of change 2008-2015	3%	4%	13%
	Turnover: % of change 2008-2015	30%	79%	107.2%
	Gross investments for tangible goods: % of change 2008-2015	-34%	10%	74%
Local active units in professional, scientific and technical activities	Local active units: % of change 2008-2015	-2%	-3%	-7%
	Turnover (it includes also administrative and support services and real estate transactions): % of change 2008-2015	30%	45%	48.2%
	Gross investments for tangible goods: % of change 2008-2015	-	-	-
Local active units in education	Local active units: % of change 2008-2015	58%	18%	26%
	Turnover: % of change 2008-2015	56%	6%	53%
	Gross investments for tangible goods: % of change 2008-2015	5%	12%	-67%
Local active units in health and social assistance in overall regional enterprises	Local active units: % of change 2008-2015	27%	24%	18%
	Turnover: % of change 2008-2015	166%	136%	221.2%
	Gross investments for tangible goods: % of change 2008-2015	23%	47%	45%
Local active units in cultural and leisure activities	Local active units: % of change 2008-2015	37%	32%	66%
	Turnover: % of change 2008-2015	-	-	-
	Gross investments for tangible goods: % of change 2008-2015	-	-	-
Local active units in other service activities	Local active units: % of change 2008-2015	0%	-9%	-12%
	Turnover: % of change 2008-2015	45%	61%	106.5%
	Gross investments for tangible goods: % of change 2008-2015	-14%	33%	79%

Source: author's elaboration on INSSE data, 2017; \*in 2008 the code of professions changed and data gathered before 2008 are not coherent with those collected afterwards



### **ESPON 2020 – More information**

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The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.