WP T4

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Transnational urban innovation cooperation strategy

Part 2

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Content

1 The URBAN INNO Transnational Urban Innovation Cooperation Strategy

1.1 Previous process/ steps/ input briefly summarised

The activities in *WPT4 – Transnational Urban Innovation Cooperation Strategy* - started in September 2017. The following activities have been performed:

A.T4.1 - Analysis of cluster and ecosystem development in each region

A.T4.2 - Comparative benchmarking of the clusters to identify shared opportunities, threats and priorities

A.T4.3 – Good practices

before developing the the transnational cooperation strategy.

1.1.1 A.T4.1 - Analysis of cluster and ecosystem development in each region

1. The first activity was the development of the **methodology** for the analysis and monitoring of the urban innovation clusters and ecosystems development in the project regions. The methodology is structured as follows:

    1. Smart Urban Innovation, Local Context and Specifics
    2. Major challenges
        - SWOT Analysis
        - Summary of current situation and future outlook in the Smart City key fields
    3. Conclusions: Challenges and Priorities for Future Development
        - Innovation challenges
        - Policy challenges
        - Priorities and recommendations for future development

    The methodology was developed, building on the results of WPT1, where the five target regions were already analysed to some extent; elements of comparison (e.g. ecosystem maturity self-assessment, focus on innovation and policy challenges) were added, so as to enable a meaningful comparison among all partner regions in the upcoming activities.

    The methodology was developed by the WP leader by taking into account the discussions with the PPs. Finally the methodology was validated in December 2017. Throughout the whole duration of the analysis of the cluster and ecosystem development it has been checked if an update of the methodology would be necessary in case some contents appears to be not suitable or other content has to be intergrated. As this hasn't been the case it wasn't necessary to change the methodology.

2. According to this methodology, the PPs started to collect relevant information on their cluster or ecosystem development mainly based the following information:
    - WPT1: analysis of the regional ecosystems in the five target regions,
    - WPT1: good practice descriptions from the four more experienced regions,
    - WPT3: description of the pilots in each project region.

The **regional clusters and ecosystem monitoring** was finalised during the final project period.

1.1.2 A.T4.2 - Comparative benchmarking of the clusters to identify shared opportunities, threats and priorities

In the next process step consequently the initial information of the analysis of the cluster and ecosystem development in each region served as an input for the comparative benchmarking.

1. During the first activity a **comparative analysis of the urban ecosystems** had been performed. This analysis contains the following items for each region:

   - URBAN INNO regions – each region described their "smart" regional context following their own content structure – e.g. brief description of the urban/ regional environment, vision and strategy, historical background, main stakeholders and governance, main activities implemented so far and/ or planned for the near future - a predefined table of contents had been omitted.
   - Current situation and major challenges - similarly to the regional context, the current situation and challenges with respect to urban innovation ecosystems had been put together on the basis of:
     - SPOT analysis performed in WPT1,
     - Pilots defined in WPT3.
   - A comparative SPOT – strengths, problems, opportunities, threats – analysis for the five target regions on the one side and for the more advanced regions – the four mentor regions - on the other side had been performed afterwards for the following criteria – economy, innovation/ R&D, user involvement, education/ human resources, policy, cluster organisation and governance.

   This activity was completed by a summary of the current situation and challenges as addressed in the pilots.

2. On the basis of this background in a second step a comparative benchmarking took place. During a benchmarking workshop the representatives of each PP/ region filled in a so-called regional assessment sheet summarising the situation in their regions with respect to the following thematic areas:
   - smart economy
   - smart people
   - smart governance
   - smart mobility
   - smart environment
   - smart living

   Following the development of the regional assessment sheets, the partners worked on the identification on complementarities and synergies in terms of common challenges and opportunities within the six areas. Those common challenges and opportunities were submitted to the partners for validation directly after the benchmarking workshop.

The identification of common priorities in the UI4 clusters represented in the URBAN INNO project represent the next intermediary step towards the development of a joint transnational strategy. The identification was performed on the basis of the comparative analysis of the urban ecosystems which was done before.

For each of the six thematic areas the participants identified common challenges and opportunities in two sub-groups, one working on challenges and one on opportunities. In a seconds step, the results of each group was given to the second one for completion and validation. The outcomes of the group work were processed after the workshop and send out to the partners for completion and validation so that three common priorities could be prioritised for each of the six thematic areas:

Thematic areas	**Common priorities**	
Smart Economy	1	Support further the development and professionalisation of the existing clusters towards comprehensive business support ecosystems in the project regions: management, services, … . Support further transnational cooperation between existing clusters; creating/ developing an exchange-service between clusters regarding successful overcoming of difficulties.
	2	Foster the implementation and transregional use of digital transformation infrastructure (Living Labs, Digital Hubs, Data centers…).
	3	Support the development of initiatives fostering qualification of staff, vocational training, … with respect to future oriented topics such as digital transformation, circular economy, … .
Smart People	1	Develop educational programs fostering citizen awareness and engagement (topics, responsibilities, opportunities, …) - implement pilot projects.
	2	Support the development of initiatives fostering qualification of staff, vocational training, … with respect to future oriented topics such as digital transformation, circular economy, … (see above).
	3	Use ICT to reach people with open mindset in a first step. Creating common platform (social media) to tell their stories to stimulate others to assume this attitude and working towards increasing "smart people".
Smart Governance	1	Improve e-services (quantity, quality, transparency) offered by cities / public administration to citizens and businesses.
	2	Improve citizen engagement and participation in decision-making processes and implementation of local development projects.
	3	Develop training/education/exchange processes with the aim to improve the capacity of civil servants and citizens (NGOs…) to cooperate better. Including ICT-based support tools.

Smart Mobility	1	Develop and implement concepts for improved multimodal mobility systems (infrastructure, funding, …).
	2	Foster the awareness and use of multimodal transport systems by citizens and businesses (staff): campaigns, pilot projects with commuters.
	3	Increase the accessibility of transport systems for better social inclusion (migrants, elderly, city-surrounding connections, ...).
Smart Environment	1	Develop and implement a circular economy strategy on city and business level (sectors, …) involving quadruple helix actors.
	2	Promote the responsible use of natural and cultural resources, including for economic (tourism) and recreational purposes.
	3	Develop and implement a comprehensive monitoring system for environmental issues involving all relevant administrations. In addition to the monitoring system an information system (using ICT) to reach inhabitants immediately during emergency rule.
Smart Living	1	Develop and implement smart systems for elderly care / other health-related groups.
	2	Foster the development and accessibility of smart (home) solutions (in general): e.g. for improved safety, etc.
	3	Foster the accessibility of the health care system for all through smart solutions.

In a next step the fields of interests for further cooperation of the respective Project Partners have been further discussed. The three thematic areas **Smart Economy, Smart Governance** and **Smart Mobility** have been identified as the central fields of common interest on which the further procedure will focus on.

1.1.3 A.T4.3 - Good Practices

As described for A.T4.4 (see below) the number of common priorities to be taken into account for this activity was reduced from six to three. The identification of Good Practices (GPs)in view to deliver a training started on this basis.

After having set the thematic scope, the following steps were the collection and review of relevant GPs from within and outside the URBAN INNO partnership – the GP databases Interreg Europe and URBACT were chosen. This procedure aimed at providing the Project Partners with useful recommendations for adoption in the context of developing transnational cooperation strategies. As stated before, the thematic focus was set on the areas Smart Economy, Smart Governance and Smart Mobility.

The following methodology was used to obtain relevant GPs for the subsequent in-depth review:

Step 1:	**Collecting GPs from different sources**
Step 2:	**Screening and first prioritisation of the GPs according to the common priorities**
Step 3:	**Screening and prioritisation of the GPs by the Project Partners**
Step 4:	**Consolidating the prioritisations into a final list of GPs for in-depth review**

Finally - and with the constant involvement of the Project Partners - five GPs per thematic area Smart Economy, Smart Governance and Smart Mobility were selected, which were then presented in more detail.

For the subsequent GP training, three GPs were again selected with the involvement of the project partners, which seemed suitable to the partners in order to gain more insights into different approaches in the three areas. Hence, future cooperation and pilot actions can be complemented by those GP insights.

1.2 Process for the development of transnational cooperation strategies to address the selected issues

In brief – in order to have a clear understanding and vision for future cooperation, the partners went through the following steps:

- Each of the nine regions carried out a detailed Regional Cluster Monitoring. In this Regional Cluster Monitoring a detailed overview of the local context and specific characteristics of the city/ region has been given, which provided the basis for an in-depths SWOT analysis following the Smart Cities approach - Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment, Smart Living - in order to map/ identify the major challenges and priorities for the future development.
- Based on a comparative analysis/benchmarking of the nine UI4 clusters – major challenges and opportunities have been identified in the framework of a comparative benchmarking workshop, furthermore topics have been identified which led to common priorities to focus on in the future.
- In the Good Practices work package, roundabout 500 GPs were collected in a multi-stage process (sources: Interreg Europe, URBACT) and reviewed and prioritised by the project partners. Finally, the six selected GPs were analysed in the fields Smart Economy, Smart Governance and Smart Mobility. In the following GP trainings the three selected GPs OpenData Trentino, the Bristol Citizen Sensing Approach and Lubljana Park and Ride were examined more intensively in webinars.
- As a result, all these activities resulted in the Cooperation Agreement signed by the Project Partners.

In the very final phase of the URBAN INNO project the transnational urban innovation cooperation strategy - ***Cooperation Agreement - for the future transnational cooperation of the URBAN INNO Project Partners*** **-** has been jointly developed, validated and signed.

1.3 Content of the Cooperation Agreement - for the future transnational cooperation of the URBAN INNO Project Partners in brief

In accordance with the mutual objectives and interests, the partners of the URBAN INNO project signed the Cooperation Agreement for a future cooperation to continue the transnational cooperation and address the challenge of making Central Europe more innovative and competitive by maximising the innovation potential of smaller and medium sized urban ecosystems, by a better linkage of its actors through the establishment of quadruple helix clusters/ networks and strengthening the existing ones in the partner regions and by development and implementation of new participatory methods.

With this cooperation agreement, the Project Partners express their willingness to work together during the next European Union funding period of 2021 to 2027 within the framework of transnational projects.

The Consortium Agreement is displayed in this document in chapter 2 – the signed Consortium Agreement (same text) together with the signatures of the Project Partners can be found as part1.

Cooperation Agreement

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for future transnational cooperation of the URBAN INNO Project Partners

Preamble:

In accordance with the mutual objectives and interests, the Project Partners of the URBAN INNO project sign the following Cooperation Agreement for a future cooperation in order to make central Europe more innovative and competitive by maximising the innovation potential of smaller and medium sized urban ecosystems.

With this cooperation agreement, the Project Partners express their willingness to work together during the next European Union funding period of 2021 to 2027 within the framework of transnational projects.

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2.1 Project Partners

We – the Project Partners of the project

URBAN INNO

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utilizing innovation potential of urban ecosystems

funded by the Interreg CENTRAL EUROPE Programme – 01. June 2016 until 31. May 2019 – hereby confirm our intention to continue our transnational cooperation (project) and address the challenge of making Central Europe more innovative and competitive by maximising the innovation potential of smaller and medium sized urban ecosystems, by a better linkage of its actors through the establishment of quadruple helix clusters / networks and strengthening the existing ones in the partner regions and by development and implementation of new participatory methods.

URBAN INNO brings together the following 12 Project Partners in 10 regions from 8 countries:

Rijeka (Croatia), represented by:

- City of Rijeka
- Ericsson Nikola Tesla d.d.

Kosice (Slovakia), represented by:

- Technical University of Kosice

Kielce (Poland), represented by:

- Municipality of Kielce/ Kielce Technology Park

Vas County (Hungary), represented by:

- Pannon Business Network Association

Maribor (Slovenia), represented by:

- Municipality of Maribor
- E-Institute, Institute for comprehensive development solutions

Burgenland/ Eastern Styria (Austria), represented by:

- Forschung Burgenland GmbH (Research Burgenland GmbH)

Vorarlberg (Austria), represented by:

- Vorarlberg University of Applied Sciences

Trento (Italy), represented by:

- Trentino Digitale spa

Karlsruhe (Germany), represented by:

- CyberForum e.V.
- inno AG

2.2 General background

The Project Partners of the URBAN INNO project fully acknowledge that transnational cooperation is of particular importance in their regions and cities.

In accordance with the Interreg CENTRAL EUROPE Programme that encourages cooperation on shared challenges in Central Europe the Partners see the following outcomes in terms of strategic value and impact of the transnational cooperation[1]:

1 Reducing disparity
2 Building trust
3 Bolstering macro-regional strategies
4 Delivering territorial cohesion
5 Improving use of limited resources
6 Tackling challenges beyond borders
7 Helping authorities to improve services
8 Creating results attractive for regions
9 Triggering investment in our future
10 Creating enduring change

These outcomes and results of the transnational cooperation projects are a necessary precondition in order to overcome trends like 'brain drain' which have a strong impact on regional ecosystems and their economic vitality. Latest studies - published in 2018 – show this is still a phenomenon.

It is a matter of fact that eastern European countries display high levels of emigration by skilled workers. Drivers of this phenomenon are poor conditions and prospects regarding work and life quality in the sending regions ('push factors'). On the other hand, better job opportunities and higher wages in other regions, mostly western and northern European countries, drive people to emigrate ('pull factors'). The consequences of brain drain are not solely negative for eastern Europe. For instance, it can ease tensions caused by an overcrowded labor market. Yet, in the most cases the negative consequences still do prevail. By the reduced human capital, innovativeness and competitiveness are most likely to suffer and can lead to a vicious cycle with even more emigration. It is therefore indispensable to take measures against the negative effects of brain drain. Policymakers, consisting of the national governments and the EU, bear special responsibility in this regard. The perceived living and working conditions and prospects of citizens in eastern Europe have to improve in order to incentivize staying in or returning to the region and to promote a more circular migration within Europe. It is moreover a task for the business communities and the educational systems in threatened regions to take active roles and advance structural progress.

[1] Interreg: 10 Things to Know About Transnational Cooperation. February 2018; https://ec.europa.eu/regional_policy/en/newsroom/news/2018/02/02-12-2018-10-things-to-know-about-transnational-cooperation

2.3 Purpose / objective of the cooperation

Regarding the challenges the Project Partners of the URBAN INNO project agree jointly that the fruitful and successful transnational cooperation should be continued within the European Union funding period 2021 to 2027.

The Partners see new opportunities and a great potential in the transnational cooperation, to familiarise themselves with measures that could be advantageous in their own regions to solve problems - e.g. stemming from urgent needs caused by brain drain - and to initiate possible applications in their own areas.

In the course of the motto URBAN INNO follows – TAKING COOPERATION FORWARD – the purpose of this Cooperation Agreement is to outline a basis for the future transnational cooperation activities as well as for advancing the respective fields of interest in a genuine and mutually beneficial exchange process of knowledge and experience, as well as the mutual realisation projects.

2.4 Subject areas of the cooperation

Due to the complementary nature of the URBAN INNO regions, there are many potential areas for cooperation, collaboration, exchange, optimising synergies, developing strategic action plans, developing and implementing pilot actions, and the (joint) promotion of the regions and cities etc.

Following the Smart City approach and the corresponding six key strategic action fields:

- Smart Economy
- Smart People
- Smart Governance
- Smart Mobility
- Smart Environment
- Smart Living

the Project Partners identified the following common challenges and opportunities of the future cooperation, which are not set in stone and might of course change in the (nearby) future:

Thematic areas	Common priorities	
Smart Economy	1	Support further the development and professionalisation of the existing clusters towards comprehensive business support ecosystems in the project regions: management, services, … .
	2	Foster the implementation and transregional use of digital transformation infrastructure (Living Labs, Digital Hubs, Data centers, …).
	3	Support the development of initiatives fostering qualification of staff, vocational training, … with respect to future oriented topics such as digital transformation, circular economy, … .
Smart People	1	Develop educational programs fostering citizen awareness and engagement (topics, responsibilities, opportunities, …) - implement pilot projects.
	2	Support the development of initiatives fostering qualification of staff, vocational training, … with respect to future oriented topics such as digital transformation, circular economy, … (see above).
	3	Use ICT to reach people with open mindset in a first step. Creating common platform (social media) to tell their stories to stimulate others to assume this attitude and working towards increasing "smart people".
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	2	Improve citizen engagement and participation in decision-making processes and implementation of local development projects.
	3	Develop training/education/exchange processes with the aim to improve the capacity of civil servants and citizens (NGOs…) to cooperate better. Including ICT-based support tools.
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	2	Foster the awareness and use of multimodal transport systems by citizens and businesses (staff): campaigns, pilot projects with commuters.
	3	Increase the accessibility of transport systems for better social inclusion (migrants, elderly, city-surrounding connections, ...).
Smart Environment	1	Develop and implement a circular economy strategy on city and business level (sectors, …) involving quadruple helix actors.
	2	Promote the responsible use of natural and cultural resources, including for economic (tourism) and recreational purposes.
	3	Develop and implement a comprehensive monitoring system for environmental issues involving all relevant administrations. In addition to the monitoring system an information system (using ICT) to reach inhabitants immediately during emergency rule.

Smart Living	1	Develop and implement smart systems for elderly care/ other health-related groups.
	2	Foster the development and accessibility of smart (home) solutions (in general): e.g. for improved safety, etc.
	3	Foster the accessibility of the health care system for all through smart solutions.

In the course of the URBAN INNO project the Project Partners finally reduced the number of priority areas to the following three to start with:

- Smart Economy
- Smart Governance
- Smart Mobility

whereby - against the background such as brain drain - the Partners do not disregard the other three priority areas:

- Smart People
- Smart Environment
- Smart Living

2.5 Commitment - roles and obligations of each Project Partner, operation of the Partnership

The intent of the Project Partners is to set-up joint cooperation activities which will last beyond the formal end of the URBAN INNO project.

In order to carry out and fulfil the aims of this agreement, each Partner will appoint an appropriate person(s) to represent its organization and to coordinate the implementation of activities.

Each Partner will contribute according to its possibililtes and disposable time frames and commit itself to the agenda and topics to ensure the further development of the Partnership. The Partners will contribute to the activities in terms of availability of own resources, and according to their field of interest.

The Partnership shall be managed by a Coordinator. The Partners agree that the position of the coordinator will rotate on a yearly basis.

Coordinator of the first year will be the city of Rijeka – Leading partner of URBAN INNO project.

For the coming years, a rolling system will be implemented, which foresees an annual change of the coordinator.

The coordinator shall be in charge to manage, organise and assure the exchange activities, the information and communication flow within the Partnership about latest developments in the regions / cities, the status and progress of project activities, calls etc.

2.6 Duration of the Cooperation Agreement

This Cooperation Agreement will be effective after the official duration of the URBAN INNO project upon signing and has no formal end.

Nevertheless, the Project Partners express their willingness to work together during the next European Union funding period of 2021 to 2027 within the framework of transnational projects.

From time to time the Cooperation Agreement will be reviewed for a possible renewal.

Further partners might join the Partnership any time.

2.7 Legal and financial obligations

This Cooperation Agreement is not binding and does not impose any legal or financial obligation or liabilities.

In the case of joint applications from all or part of the partners, and possible resulting projects, the roles, responsibilities, financial contributions, etc. of each partner will be clearly outlined when this becomes necessary. The participation to these activities beyond the end of the URBAN INNO project will take place on a voluntary basis.

The working language is English.

Signatures

Signed for and on behalf of:

Partner Institution	
Name, Surname	_____
Position	_____
Place and date	_____
Signature and Stamp	_____

3 Excursus: Brain Drain in Eastern Europe

In a separate chapter we deal with the topic brain drain. In this context, new studies, working papers, etc. were published in 2018. A glance at Google shows that this topic is continuing and that the view of demographic change also needs to be considered.

Since the aspect of brain drain or outflow of labour also appears again and again in the analyses of the project partners, we have taken this opportunity to go into brain drain in more detail. In these publications recommendations are also given, which can give further ideas for regional development to the project partners.

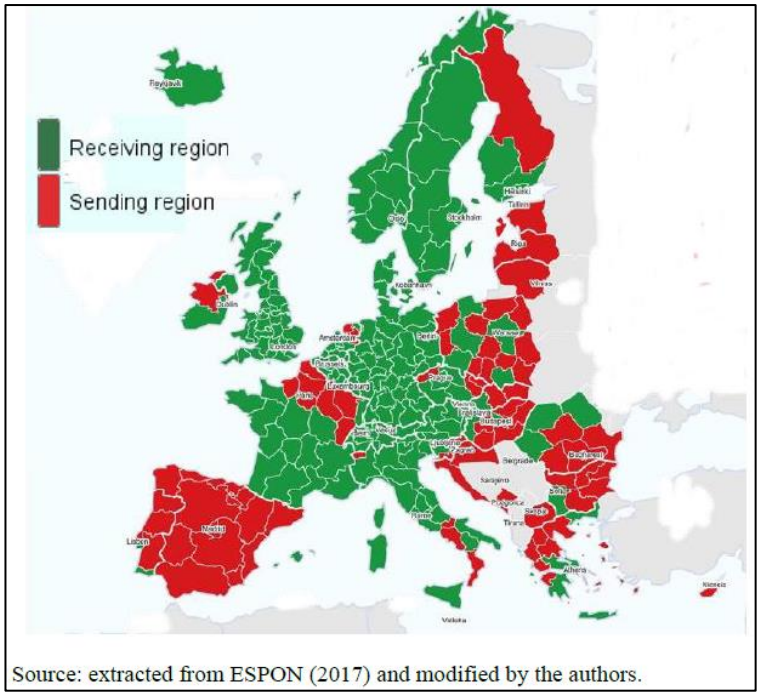
3.1 Introduction

The freedom of movement for workers is one of the basic principles of the European Union, giving EU citizens the right to move freely within the territory and to hold down a job irrespective of national borders. This intra-EU mobility of qualified workers is supposed to stimulate innovation and to boost the knowledge economy within the EU (R5, 5). However, in some regions ('sending regions') this freedom has led to a significant out-migration of their highly educated workforce to the advantage of other regions ('receiving regions') (R3, 1). Especially new member states located in central and eastern Europe are facing this problem due to limited capacities to create attractive conditions for these workers to stay (R1, 1; R3, 1; R5, 5). Because of the permanent and unidirectional character of the migration of highly qualified workers resulting in a skilled labor shortage within the sending countries, this phenomenon is commonly referred to as brain drain (R5, 5). Brain drain most likely increases asymmetries and inequalities between sending and receiving EU countries and entails the danger to prevail the benefits of intra-EU mobility for some regions (R1, 1; R5, 5). Therefore, it is hardly surprising that the topic is experiencing growing attention from research and politics.

This chapter analyzes the role of brain drain within eastern European countries by summarizing the findings of related publications. In order to do so, the following structure is applied. First, the report provides an overview of the current situation regarding brain drain in relevant countries. Major drivers of brain drain are explained followed by a description of the most important consequences. Next, measures for stemming the negative effects of brain drain are presented. Lastly, the situation is summarized within a short conclusion.

3.2 The Situation of Brain Drain in Eastern Europe

Figure 1 visualizes the distribution of sending and receiving regions of Europe regarding intra-EU mobility in the year of 2014. It appears that several regions in eastern Europe across the north (e.g. Estonia, Latvia, Lithuania), the center (e.g. Poland, Slovakia, Hungary) and the south (e.g. Romania, Bulgaria) display a negative rate of intra-EU migration. However, since there is evidence for several regions to switch from 'sending' to 'receiving' or vice versa over time, this status can be viewed as dynamic. (R3, 8f.)



Source: extracted from ESPON (2017) and modified by the authors.

Figure 1 (R3, 9)

In 2017, about 3% (17 million) of the total population of the current 28 EU member states accounted as movers to other member states. Of these, 32% (5.5 million) were in the 15-34 age bracket. Furthermore, with 25% (4.2 million) a significant proportion of intra-EU movers between 15 and 64 had a tertiary level of education (R3, 11f.).

As seen before, eastern European countries constitute major sending regions and therefore suffer particularly from the loss of high skilled workers. Several statistical investigations put this problem into figures. Media outlets in Bosnia and Herzegovina calculate the costs of educating a doctor to an estimated € 150,000, indicating that the country spends more than 50 million EUR annually on educating health workers who will leave the country (R6). Over a period of 10 years, the loss of university graduates in Serbia emigrating, accounts for an estimated 9 billion USD due to education expenses (R7).

The best are all too often leaving, responding to declining economic growth and more tempting opportunities abroad (R2, 5). Also, forecasts predict a continuing slow but steady outward migration from eastern European countries for the future (R2, 33). Further problematic aspects are increasingly unfavorable demographics, which is an issue all over Europe (R2, 5); as well as the necessity to overcome the former economic model of low skilled and low cost labor, bearing the threat of running into a middle income trap (R1, 2; R2, 3 & 32). Taken all together, this creates a precarious situation for eastern European countries. Decisions being made within the next few years will determine the sustainability of future prosperity (R2, 5).

3.3 Drivers of Brain Drain in Eastern Europe

This section depicts the major drivers causing migration of high skilled workers in general and more specific in eastern Europe. As expressed before, major brain drain among EU member states is enabled and to some extend even encouraged by the legally binding freedom of movement. It is a common practice to distinguish push and pull factors when considering drivers of brain drain. Push factors describe conditions in the current place of living of workers which make them feel the urge to leave this particular place or country. Pull factors, on the other hand, concern a place where a worker is not currently living but make this place desirable to move and live there for a longer period of time.

Push factors encompass structural issues of a region or country. It is not surprising that negative labor market conditions create dissatisfaction among workers. First and foremost, this is caused by a lack of (enticing) jobs and by low salaries (R3, 15). Existing enterprises often belong to the small or micro sector and tend to be inefficient leading to a poor perceived future-proofness of working there (R1, 2f.). Moreover, administrative barriers can hamper the establishment of new businesses (R1, 5). Other structural issues concern the political situation. Mistrust in governments (due to corruption etc.), poor education, economic depression and a general non-convergence of living standards to other countries are likely to cause the desire to seek opportunities elsewhere (R1, 2; R3, 15; R5, 47). What most push factors have in common is, when leading to emigration of skilled workers, to have a self-reinforcing character (R1, 2).

When considering highly skilled workers, pull factors play a more relevant role than push factors. In short, these factors address enticing job opportunities available in other regions. This is determined by aspects like economic growth, higher wages, higher employment rates, easier access to the labor market, robust social security, high wealth level and other, sector-specific strengths. Besides, a region is usually considered favorable if it has a high linguistic and cultural similarity to the worker's home region. (R3, 13)

Additional to these general factors it is necessary to take country-specific aspects into consideration to fully comprehend the driving forces of brain drain. This is illustrated by the following examples. Due to the stark absence of visible progress, many citizens in the western Balkans have the feeling that moving to another region is inevitable when trying to reach for a better life (R4, 6). A survey in Croatia found corruption, religious chauvinism and nationalism as the foremost drivers of emigration (R8). Hungarian citizens suffer from an over-politicized and severely polarized society, reintroduced university fees and a highly strained social security system. Besides, they are experiencing a widening gap in living standards vis-à-vis to their neighbors (R5, 47). Lastly, the majority of Latvian households has a family member or friend living abroad which makes departing and orienting in a new country much easier (R5, 54).

3.4 Consequences of Brain Drain in Eastern Europe

This section focuses on the consequences for eastern European regions due to emigration of skilled workers. It is shown that the phenomenon can have negative as well as positive impacts.

It is obvious that brain drain entails negative effects for sending regions. The reduction of stock in human capital can lead to a serious shortage of labor and/or skills. Accordingly, the region's capacity to innovate and adopt more advanced technologies declines. Besides, negative impacts on the labor market (e.g. reduction of wages), national finances (e.g. reduction of tax income, loss of investment in education) and goods market (e.g. reduction of consumption) are natural consequences. In sum, this can create hazardous conditions for a region's economy. When the negative impacts prompt other workers to leave the region as well, this vicious cycle threatens the region's prosperity even more. (R3, 16; R5, 88)

It has a further negative effect when skilled workers migrate to another region and end up being unemployed or employed in a job not requiring their high skills. Due to this sheer inefficient utilization of human capital this effect is commonly referred to as 'brain waste'. Several factors reinforce the occurrence of brain waste. A low or mismatching quality of education is one of the factors as well as a lack of transferability of skills (e.g., due to language barriers). Furthermore, incomplete integration, the development of migrant networks and the desperate need for low skilled workers in western European sending regions can intensify brain waste. Additional to the inefficient use of skills, problematic consequences are a reduced incentive to invest in human capital and a negative effect on the future integration prospects of immigrants. Therefore, brain waste constitutes a highly unfavorable subtype of brain drain with consistently negative impacts for both sending and receiving regions. (R3, 16; R5, 42)

However, the consequences of brain drain for sending regions are not necessarily negative. The emigration of skilled workers can also create benefits. In the case of a surplus of job seekers, emigration acts as a safety valve as it helps to reduce unemployment within the region. The risk of revolts or unrest is reduced and money on unemployment or other social benefits is saved (R5, 57; R4, 15). This advantage especially holds for Poland where the labor market during the last decades was unable to keep pace with the development of the education sector. Instead of brain drain, in such cases, the term 'brain overflow' would be more appropriate (R5, 39ff.). Sending regions also benefit from remittances, denoting money sent by emigrated workers back into their home region to family or friends. This money is brought into the economic cycle of the sending region and boosts aggregate demand (R5, 57). In Bosnia and Herzegovina, for example, remittances amount to an estimated 11 percent of the GDP (R9, 30). Furthermore, brain drain can increase incentives and motivation of those who stay behind in the sending regions to advance their education (R3, 16; R5, 56). Finally, the local industry in sending regions might benefit from brain drain in terms of connections with the global market and knowledge transfer from those who worked abroad. Naturally, to realize these opportunities, a certain level of return migration has to be provided. It is therefore a key challenge to promote circular migration (R4, 15, 18; R5, 88).

3.5 Measures against the Negative Effects of Brain Drain

This section describes measures to take against negative impacts of brain drain in eastern Europe. It is a common understanding that rolling back the free movement of labor is not a viable solution against brain drain (R1, 1; R5, 51). This is demonstrated by a recent case of the Hungarian government compelling medical students to work in Hungary for a number of years after graduation. As a consequence, students resisted and the measure most likely had the counterproductive effect of deterring some potential students from the medical profession (R5, 48). Instead, it is essential to realize that the majority of eastern Europeans would prefer to live and work in their home region, yet are concerned about the economic situation and living standards (R4, 18; R5, 51). The focus should therefore be on reversing the negative effects of the brain drain by strategically strengthening these regions' overall prosperity (R1, 1). The three pillars of policymakers, business community and educational systems bear the responsibility to take actions (R1, 6).

Regarding policymakers, it is especially the sending regions' governments which can influence brain drain. First and foremost, they must realize that the regions are entering a new phase and accordingly adopt their self-perception: as players on a bigger, global stage who compete for higher value added businesses, skilled talent and smart capital (R1, 2). This implies a change of culture towards entrepreneurism and risk-taking as well as concrete policy measures. By facilitating bureaucratic procedures, providing physical infrastructure, enhancing the dialogue with talents and advancing digitalization, governments can increase trust between citizens and institutions, boost entrepreneurial activity, improve how citizens perceive future living conditions and strengthen incentives for emigrants to return (R1, 4f.; R2, 4; R3, 72; R4, 16f.). Moreover, it is essential to develop financing tools for young and high-risk projects. This encompasses the possibilities to acquire venture capital and programs preparing firms for bond issuances. Besides, a stable capital market provides required liquidity and even offers citizens the opportunity to participate in the success of local economies (R1, 5).

As a policymaker on an international level the European Union is responsible to stem brain drain in eastern Europe as well. The EU should use its existing platforms to connect national labor markets, clearly communicate employment demand and opportunities abroad and promote circular migration by launching programs that target professionals, leading to an overall more institutionalized migration (R4, 20f.). Further conceivable legislations are a European minimum wage, stronger trade union rights and minimum benchmarks for investment in human capital (R5, 51).

The next pillar, business community, can also take active responsibility to advance the necessary structural transformation and consequently help to ease or reverse brain drain. This can happen by improving working conditions and offering more plentiful opportunities to workers. Digitalization is once again a major opportunity in this regard. For instance, it could facilitate remote working (R1, 4). In general, it should be a key focus of businesses to be highly responsive and innovative in order to being able to compete on an international level.

Lastly, it is also the task of the educational system to face brain drain. The development of human capital is critical for ensuring a successful structural transition from production-to innovation-driven economies. Education should emphasize the flexibility to respond to change as well as a

culture of life-long training and re-skilling of the existing labor force. Particular topics to educate, which are required to compete in the future, are digital and soft skills, entrepreneurial training and financial literacy. (R1, 3ff.)

A showpiece for the positive impact of measures against brain drain is the case of Estonia. During the last years, the Estonian government displayed a high embracement of innovation and entrepreneurism. The banking system is sound and credits are affordable. Thus, Estonia became the most entrepreneurial country in entire central and eastern Europe, attracted a substantial amount of venture capital and boosted its exports. As a consequence, the emigration was stemmed significantly. (R2, 55)

3.6 Conclusion

It is a matter of fact that eastern European countries display high levels of emigration by skilled workers, commonly known as brain drain. Drivers of this phenomenon are poor conditions and prospects regarding work and life quality in the sending regions ('push factors'). On the other hand, better job opportunities and higher wages in other regions, mostly western and northern European countries, drive people to emigrate ('pull factors'). The consequences of brain drain are not solely negative for eastern Europe. For instance, it can ease tensions caused by an overcrowded labor market. Yet, in the most cases the negative consequences still do prevail. By the reduced human capital, innovativeness and competitiveness are most likely to suffer and can lead to a vicious cycle with even more emigration. It is therefore indispensable to take measures against the negative effects of brain drain. Policymakers, consisting of the national governments and the EU, bear special responsibility in this regard. The perceived living and working conditions and prospects of citizens in eastern Europe have to improve in order to incentivize staying in or returning to the region and to promote a more circular migration within Europe. It is moreover a task for the business communities and the educational systems in threatened regions to take active roles and advance structural progress.

3.7 Sources

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