Metropolitan Innovation Systems (MIS) of Capital Cities in Western Balkan Countries and Moldova

Baseline Assessment and Potential Capacity Building in the EU-Context

Alexander G. Welzl
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Executive Summary

Currently no approach is available worldwide that allows to comparatively describe the innovation system of metropolises in a holistic and at the same time pragmatic manner based on quantitative and qualitative information.

This study aims to provide an initial framework for analysing Metropolitan Innovation Systems (MIS) using the available data collected from five very different metropolises and their regional as well as national contexts respectively. All of the selected cities in this sample are at the same time capital cities of their countries. With their regional domestic product and their network of key-players from the public and private domain they are part of national economies which are in different stages of economic transformation.

Based on a questionnaire for local government authorities data was collected with support and in collaboration with NALAS (Network of Associations of Local Authorities of South-East Europe) based on four layers:

1) Strategy and mid-term development of the metropolitan innovation ecosystem
2) Structure & Processes of the metropolitan innovation ecosystem
3) Financing of the metropolitan innovation ecosystem
4) Digital transformation & Start-ups

The metropolises/capital cities selected for this study are: Podgorica (Montenegro) and Tirana (Albania) representing the Western Balkan Countries, Chisinau (Moldova) as well as the two peer metropolises Ljubljana (Slovenia) and Vienna (Austria) representing the European Union. The structure, rationale and some initial ideas of this study were also discussed with representatives of European cities and members of the EUROCITIES ‘Working Group Innovation‘ within its focus on ‘Local innovation ecosystems‘ during a meeting at the EUROCITIES Economic Development Forum (EDF) ‘Cities‘ long-term investments for a stronger European economy‘ in Vienna, 16 - 18 October 2017.

Taking into account the complex socioeconomic transition phase of all of the selected countries except Austria, the goal and the major expected result of this study was a baseline assessment of framework conditions and as far as possible collection of data provided by local authorities, international institutions and key-players of the MIS.
Only the city of Vienna was able to provide the full range of information regarding the innovation strategy, the innovation network (key-players) and processes as well as financial data (capital flow statistics) and information on digital transformation including a lively start-up culture. None of the local government authorities of the two Western Balkan capital cities and the municipal government of Chisinau had the capacity to provide the requested data about their MIS.

**Recommendations for Local Government Authorities in Chisinau, Podgorica and Tirana**

1. **Metropolitan strategy development:**

   Compared to Ljubljana and Vienna as potential blueprints the municipal governments of Podgorica, Tirana and Chisinau should set-up a strategy development process within a specific time horizon to provide mid- and longterm goals for the development of the Metropolitan Innovation System.

2. **Statistical data and transparency:**

   Again compared to the peer cities the municipal governments of Podgorica, Tirana and Chisinau should implement and continuously maintain a statistical framework and key data sets on municipal level in order to provide for monitoring of performance of public service delivery lines, expenditures and investments. This would also create more transparency towards the regional stakeholders and potential investors.

3. **Transparency and communication:**

   The local government authorities of the three cities should strive for continuous improvement of their communication procedures and create transparent staff responsibilities as well as (single) points of contact for external requests. Key statistical data should be provided on a regular basis (for instance biannual) in English on the municipal government’s websites.

These recommendations are in line with the results of the discussion in the panel session ‘Activating Local Economy’ during the ‘Danube Governance Forum - Improving Governance Together’ taking place on December 4, 2017 in Vienna.
1 Introduction

Due to the demographic trends the UN expects the proportion of people living in metropolises to rise up to 66 percent of the World’s population\(^1\) by 2050. As long as no catastrophic agents like a nuclear war sparked by ever intensified renationalisation or a globally spread plague fuelled by climate change and transcontinental mobility will reduce world population drastically the complex problems especially in urban agglomerations will keep gradually increasing as well.

The emergent grand societal challenges\(^2\) which affect humankind can be in turn answered especially with the intellectual power of the diverse communities and cultures dwelling and interacting in the cities. Preconditions for effective learning and problem solving processes therefore are well functioning Metropolitan Innovation Systems (MIS)\(^3\). Associated with these multilevel and network-based ecosystemsque urbanisations are milieus of creativity which are crucial to provide room for idea-exchange and learning across all types of borders\(^4\).

Against this backdrop transition power and the capabilities to cope with disruptive changes will pose the decisive craft to solve the arising problems and invent novel, systemic solutions. Therefore studying transition phenomena in metropolitan regions of developing as well as developed countries is very promising in order to support problem solving on local, regional as well as national level.

On the geopolitical level the rise of China as an influential change agent of world economics recalibrates the political as well as the economic agenda also of the EU and its Eastern European neighbourhood countries (Barisitz and Radzyner 2017, Bastian 2017, García-Herrero and Xu 2016, Levitin, Jakov Milatovic and Sanfey 2016). It is still not predictable if the global equilibrium of power moves towards a novel bipolar or a multipolar world in the coming decades\(^5\). Furthermore it is also unclear how successful the Chinese government manages its already perceiveable efforts to build up soft-power along with the ever growing influence in terms of economics, global finance and socioeconomic development in Eurasia, Africa and other parts of the world.


\(^3\) Fischer, M., Diez, J.R. and Snickars, F. (2001)

\(^4\) Milieus of creativity in University Research: [http://www.societyofcontrol.com/pmwiki/Akademie/uploads/Main/kreatmil.pdf]


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2 Metropolitan Innovation Systems (MIS)

In recent years innovation systems in large agglomerations were addressed in research conducted under a variety of headlines: local innovation systems, municipal innovation, urban innovation systems and quite recently metropolitan innovation systems (amongst others: the MIT Local Innovation Systems Project\(^6\), the Harvard Project on Municipal Innovation\(^7\), the GIZ report on regional metropolitan innovation systems of developing countries\(^8\)). The importance of metropolitan areas as hot spots for innovation (Diez 2002) is underlined by their diversity of cultures and ethnicities, (individual) knowledge, types and sizes of corporations, research organisations and creative milieus against the backdrop of vibrant sub-cultures as well as a mainstream culture. Therefore a model for describing these innovation ecosystems has to embrace Richard Florida’s notion of the three Ts (talent, technology and tolerance). Regarding a functional model of metropolitan innovation this means the enrichment of the triple helix approach towards a ‘Quadruple Innovation Helix System’ (Dziemianowicz 2017).

2.1 Metropolises – an Approach to Defining the Playing Field

Quantitative Indicators and qualitative descriptions which represent and describe characteristics of metropolises comprise size (relative to other urban areas in the country) with regard to geographical area, number of inhabitants and regional economic product (in comparison to GDP), number of players in the network of the MIS, FDI capital flows, number of talented people, education institutions, corporate headquarters and R&D-centers, milieu of creativity, start-up culture, tolerance and demographical composition of ethnicities, number of public institutions located in the MIS, number of municipal programs, financing instruments and service delivery lines of municipal governments, number of federal institutions located in the MIS and their federal programs and financing instruments, knowledge transfer between art/creative professionals and other parts of the society (public administration, schools, universities, corporations), intensity of social innovation, capacity and use of digital platforms and communities, quality of life (urban ecosystem and sustainability, recreation, percentage of green belts in the city, environment in the surrounding of the metropole region) as well as gender equality.

Regarding the definition of metropolitan areas (metropolises) in Europe the EUROSTAT-regional typology characterizes 255 metropolitan regions containing 24 capital cities (Mayerhofer 2015). Due to the definition of EUROSTAT „metropolitan regions are approximations of functional urban areas (cities and their commuting zones) of 250 thousand or more inhabitants“ (Eurostat 2016).

\(^6\) [http://web.mit.edu/lis/](http://web.mit.edu/lis/)
\(^7\) [https://datasmart.ash.harvard.edu/project-municipal-innovation](https://datasmart.ash.harvard.edu/project-municipal-innovation)
\(^8\) [http://www2.giz.de/wbf/4tDx9kw63gma/InnovationSystems_Metropolitan-Regions.pdf](http://www2.giz.de/wbf/4tDx9kw63gma/InnovationSystems_Metropolitan-Regions.pdf)
2.2 A Systemic Model to Describe Metropolitan Innovation Systems (MIS)

Currently no approach is available worldwide that allows to comparatively describe the innovation system of metropolises in a holistic and at the same time pragmatic manner based on quantitative and qualitative information. Although several research groups and institutions dealt or currently deal with the issue of urban innovation they all have a specific perspective on this question. The city of Vienna commissioned a comparative study in 2015 focusing on the regional economic development of 255 European metropolises (Mayerhofer 2015). As one integral part of the regional economic development some aspects of innovation are addressed as well. A just recently published survey report on ‘local innovation ecosystems’ of European cities published by EUROCITIES contains no comparable data of the involved cities (EUROCITIES 2017).

2.3 The Goals and Limitations of this Study

This present study aims to provide an initial framework using the available data collected from five very different metropolises and their regional as well as national contexts respectively. All of the selected cities in this sample are at the same time capital cities of their countries. With their regional domestic product and their network of key-players from the public and private domain they are part of national economies which are in different stages of economic transformation. This study was implemented in collaboration with Network of Associations of Local Authorities of South-East Europe (NALAS). NALAS “is a network of associations of local authorities of South East Europe. The Network brings together 14 Associations which represent roughly 9000 local authorities, directly elected by more than 80 million citizens of this region. The NALAS Secretariat, based in Skopje, is responsible for the overall coordination and the implementation of the activities. NALAS was created in 2001 following the first Forum of Cities and Regions of South-East Europe (Skopje, November 2000), organised by the Congress of Local and Regional Authorities of the Council of Europe”. The design and goals of this study correspond to the survey and report on ‘Local innovation ecosystems’ published by the EUROCITIES ‘Working Group Innovation’ in September 2017. The structure, rationale and some initial ideas were also discussed with representatives of European cities and members of the EUROCITIES ‘Working Group Innovation’ within its focus on ‘Local innovation ecosystems’ during a meeting at the EUROCI-
TIIES Economic Development Forum (EDF) ‘Cities’ long-term investments for a stronger European economy’ in Vienna, 16 - 18 October 2017\(^1\)^.

Taking into account the complex socioeconomic transition phase of all of the selected countries except Austria, the goal and the major expected result of this study was a baseline assessment of framework conditions and as far as possible collection of data provided by local authorities, international institutions and key-players of the MIS. However, the difficult circumstances especially in Moldova but also in Podgorica and Tirana only allowed for collecting anecdotal evidence. Therefore, the main focus of the study was to develop useful questions and providing a framework that can be used to explore the status-quo of Metropolitan Innovation Systems in general.

The designed model of analysis takes into account that the granularity level of fact-based decision supporting instruments in a real world setting of (political) decision makers must never be too complex. This means: models with more than 20 to 30 indicators have no practical relevance. Furthermore, metropolitan innovation systems comprise the interplay between formal structures and defined processes as well as an informal level of communication. This informal side of the coin represents information exchange and decision-making between individual representatives of MIS-stakeholders. Although important, it can never be sufficiently reflected in any (economic) fact-based, quantitative model. In addition, we know from the reality of capital market actors (as well as from politics) how powerful the element of narration forms the individual mindsets and contributes to decision-making (Ho 2009). A viable MIS-model therefore has to provide room for qualitative description and story telling to contribute to creating the narration of a city’s creative milieu. Finally, continuity in the municipal development over time is a decisive success-factor. Therefore, the existence of a strategic approach gathering the municipal officers as well as all other stakeholders and key-players behind mid- to long-term goals is part of the analysis.

The model developed in a first step in the context of this study should serve three goals in the long run:

1) In a first step it provides a basic framework for baseline assessments that allow standardised data collection of MIS covering issues from mid-term oriented municipal strategy development to structures and processes as well as public and private capital flows.

\(^1\) [http://nws.eurocities.eu/MediaShell/media/DraftprogrammeEDFVienna1618oct201707172017.pdf](http://nws.eurocities.eu/MediaShell/media/DraftprogrammeEDFVienna1618oct201707172017.pdf)
2) Secondly it should lay the foundation for a pragmatic monitoring of existing public service-delivery lines and capacities against the backdrop of the needs of innovation players thus adding value to the decision processes of local government authorities.

3) Finally the collected data and systemic overview of the status-quo of the described MIS should also serve public and private investors (corporations, banks and institutional investors like pension funds) as well as IFIs (international finance institutions like World Bank, EIB etc.) as an additional source for their investment decisions in the described innovation locations.

2.3.1 The Design and Structure of the MIS-Assessment Model

The framework of the developed model for innovation systems of metropolises includes four levels of analysis describing the status-quo and mid- to long term development perspectives. Furthermore following the theoretical concepts of quadruple a quintuple innovation systems (Carayannis and Campbell 2012) information will be collected with regard to four constituting MIS-key players as well as one basic grand challenge of societal development (as an overarching notion as far as provided by the municipal governments): (1) government (2) (tertiary) education system (3) corporations (4) citizens and (5) sustainability.

Although a creative milieu and individual capacity building in the course of the individual (learning) biographies is strongly influenced by the educational system starting with Kindergarten, the offer of Kindergartens, primary and secondary schools in the selected metropolitan areas is not part of the implemented model of this study.

Based on a corresponding questionnaire for local government authorities (see Annex I page 40) data therefore was collected (as far as possible) referencing the four layers:

1) Strategy and mid-term development of the metropolitan innovation ecosystem
2) Structure & Processes of the metropolitan innovation ecosystem
3) Financing of the metropolitan innovation ecosystem
4) Digital transformation & Start-ups

2.3.1.1 Strategy and Mid-term Development of the Metropolitan Innovation Ecosystem

In order to set the stage and describe the notion of innovation in the local metropolitan context municipal officers (as well as other stakeholders) are asked to answer the question what ‘innovation’ actually means in the context of their individual city. This specific question arouse out of a discussion with Western Balkan experts of the World Bank. They recommended to have the understanding of innovation as such be defined against the backdrop of recent historical developments and the stage of the
development of economies in transition in the Western Balkans and Moldova. Apart from this very basic question of understanding innovation the mid-term perspective and organisation of the MIS is created effectively and efficiently only by using a strategic approach. Therefore the process of developing a metropolitan innovation strategy, the procedures and formats of involving the stakeholders, the selected communication channels as well the content, timelines and steps of implementation form the first part of the analysis. As far as citizen’s participation and sustainability goals are concerned their strategic role should be described here.

2.3.1.2 Structure and Processes of the Metropolitan Innovation Ecosystem

To understand and evaluate the diversity and the effectiveness of the network of players and the targeted municipal service delivery lines the innovation ecosystem has to be described in sufficient detail. Therefore this part of the analysis concentrates on a description of the stakeholders and key-players comprising the MIS. In this way also an overview should be given regarding the number of the main contributing public organisations, universities and corporations. The local government departments, public funding and business promotion agencies as well as funding programmes which are part of the innovation ecosystem are described as well. In the case a metropolitan innovation strategy exists the described players, structures and processes should of course be in line with the strategic framework supporting its gradual implementation over a mid- to long-term time horizon. The question of addressing the inclusion of citizens in the metropolitan innovation cycle as well as issues of sustainability is also part of this step of analysis.

2.3.1.3 Financing of the Metropolitan Innovation Ecosystem

As on national level where ‘the budget is the government’s program cast in figures’ also on local level R&D-spending and capital flows give an understanding of the development of the MIS. This part of the analysis should (as far as possible) provide detailed figures about private sector R&D-spending, public sector R&D-spending, foreign investments including EU and International Finance Institutions as well as foreign direct investment (FDI) capital flows with regard to corporate spending.

2.3.1.4 Digital Transformation & Start-ups

Whereas the Western Balkan Countries and Moldova are still in a phase of severe economic transition affecting all aspects of governance and value creation processes on macro- as well as on microeconomic level the digital transformation also poses a far reaching change and transition process in the developed open economies of the European Union. Therefore the analysis also covers the question of how digitalisation takes place in the MIS e.g. materialized in internet-based government services as well as part of the start-up ecosystem of the city which is an area of analysis itself.
3 Baseline Assessment of the Metropolitan Innovation Systems

In this chapter the MIS of Chisinau, Ljubljana, Podgorica, Tirana and Vienna are described based on the information available. However only the city of Vienna was able to provide the full range of information regarding the innovation strategy, the innovation network (key-players) and processes as well as financial data (capital flow statistics) and information on digital transformation including a lively start-up culture. None of the local government authorities of the two Western Balkan capital cities or the municipal government of Chisinau had the capacity to provide the requested data about their MIS.

Although in some cases - for instance budget and financial data on municipal level - statistics obviously are available in principle the information however is only provided in the language of the country and not in English.

3.1 The Metropolitan Innovation System of Vienna (Austria)

Most of the data referenced in this analysis of the MIS Vienna was provided either directly or indirectly by experts of the Municipal Department 23 (Economic Affairs, Labour and Statistics) of the Vienna City Administration. Based on a process also guided and managed by the Municipal Department 23 the city developed its strategy „Innovative Vienna 2020“ from mid of 2014 to mid of 2015. At the beginning of 2016 the implementation started. This strategy builds on the previous one called „Vienna thinks future“ and contributes essentially to the goals of the „Smart City Framework Strategy“. It consists of 8 fields of action aligned within 3 innovation goals. All in all 27 institutions and organisational units of the municipal government are involved in the implementation (cited from the „Arbeitsprogramm 2018“):

1. Wirtschaftsagentur Wien
2. Wiener Wissenschafts-, Forschungs- und Technologiefonds WWTF / WWTF GmbH
3. Wiener Krankenanstaltenverbund
4. Wiener ArbeitnehmerInnenförderungsfonds waff
5. Wiener Volkshochschulen
6. Schulen
7. Wiener Stadtwerke Holding
8. Fonds Soziales Wien
9. Urban Innovation Vienna
10.INITS - Universitäres GründerService

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This strategic approach corresponds to the network of players comprising the metropolitan innovation ecosystem and provides a framework for mid-term development. Following the notion of the **triple-helix innovation system** the basic structure of this analytical approach refers to the three main groups of players within a innovation system in an urban context. These groups comprise players in the **public domain** (municipal government, urban/regional promotion agencies and funds, technology transfer institutions), **research institutions** (tertiary education, RTOs and cooperative research organisations) and **corporations**. The structure below follows an analysis published by the Austrian Council\(^\text{16}\).

A) **Public sector:**

1. **Governance level:** municipal government, municipal departments

2. **Regional Promotion Agencies & Funds:** Vienna Business Agency, Vienna Science and Technology Fund (WWTF) and 7 specific funds for science and research\(^\text{17}\)

\(^{17}\) [https://www.wien.gv.at/english/research/suppvienna.html](https://www.wien.gv.at/english/research/suppvienna.html)
3. **Technology transfer organisations**: INiTS centre (the Academic Business Incubator), Technologyparks (Tech Gate Vienna Wissenschafts- und Technologiepark GmbH, Techbase Science Park Vienna GmbH), ’Pilotfabrik 4.0‘ in Aspern and the Technology-Center Seestadt¹⁸

B) **Research Institutions:**

1. **Universities**¹⁹: 9 public universities, 5 private Universities and 5 Universities of Applied Sciences

2. **Research and Technology Organisations & Cooperative Research**: 41 Christian Doppler Laboratories²⁰, 18 Ludwig Boltzmann Institutes²¹, 4 COMET-Centers (Competence Centers for Excellent Technologies)²², IMBA, IMP, AIT and others

C) **Corporations:**

1. **Companies** (Schwantzer 2017): ICT (5700 digital companies), Smart Production (8.500 manufacturing companies), Life Science (430 life science companies)

2. **private Coworking-Spaces, Incubators and Accelerators**²³: i5invest Inkubator, Treibhaus, Coworking-Space in the Cisco Office in Millenium Tower, Matchmaker Ventures, A1 Start-up Campus, Frequentis Start-up Center, RBI Fintech-Accelerator-Program "Elevator Lab", weXelerate (in 2017), Erste Group Fund of Excellence and Erste Vision Capital

3.1.1 **R&D-Expenditure and Capital Flows in the MIS Vienna**

As an indication for the development of the metropolitan innovation ecosystem R&D-financing gives an insight into the sources of funding in Vienna. Data is collected and provided on a biannual basis by Statistik Austria in the course of a specific analysis for the municipality of Vienna. Table 1 below shows financing of R&D-expenditure in the specific sectors of funding (corporate sector, public sector, private not-for-profit sector, foreign direct investment, EU).

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¹⁸ https://www.wien.gv.at/stadtentwicklung/projekte/aspern-seestadt/bildung-forschung/pilotfabrik.html
¹⁹ https://wissenschaft.bmfw.gv.at/bmwfw/studium/studieren-in-oesterreich/unis-privatunis-fhs-uebersicht/
²⁰ https://www.cdg.ac.at/ueber-uns/zahlen-daten-fakten/
²¹ http://www.lbg.ac.at/themen/die-ludwig-boltzmann-gesellschaft-forschung-fuer-menschen
²² https://www.ffg.at/sites/default/files/allgemeine_downloads/strukturprogramme/ffg_comet-landkarte2017_web1.jpg
²³ https://repository.fteval.at/317/1/2016_FT8.pdf
Table 1: R&D financing in Vienna 2002, 2013 und 2015 (sectors of funding)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Corporate sector</th>
<th>Public sector</th>
<th>Private not-for-profit sector</th>
<th>Foreign Direct Investment incl. (international) organisations (excl. EU)</th>
<th>EU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Total</td>
<td>Federal</td>
<td>Provinces</td>
<td>Municipalities</td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32.2%</td>
<td>40.0%</td>
<td>32.2%</td>
<td>10.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>2013</td>
<td>3,177,617</td>
<td>1,119,641</td>
<td>1,530,853</td>
<td>1,204,761</td>
<td>97,274</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35.2%</td>
<td>48.2%</td>
<td>35.2%</td>
<td>38.5%</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37.5%</td>
<td>46.3%</td>
<td>37.5%</td>
<td>48.8%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>


Between 2002 and 2007 the contribution of the corporate sector rose from 32 percent to around 36 percent. In the years of the financial crisis this proportion shrank and there was a stagnation of corporate expenditure in absolute terms. In 2013 the R&D-spending of companies in Vienna reached 35 percent and exceeded the pre-crisis level with nearly 38 percent in 2015. However in the same period foreign direct investment (mainly from corporations and to a smaller extent from international organisations) was reduced almost by half between 2002 and 2013. Whereas foreign companies contributed 25 percent to R&D-spending (approximately 514 million Euro) in 2002 in Vienna this share decreased in the course of the financial crisis: in 2013 foreign corporations spent only 411 million Euro (13 percent) in R&D. This trend continued also in 2015. In this year the contribution of foreign firms dropped to 12 percent although R&D-spending rose slightly in absolute terms (approximately 424 million Euro).

The composition of R&D-expenditure changed significantly between pre- and post-crisis times. Whereas in 2002 the majority of financing came from corporate sources (nearly 1,2 billion Euro or approximately 58 percent – this includes also FDI) and only 40 percent were contributed by the public sector the picture was quite different in 2013. In this year both – the corporate and the public sector – spent approximately 1,5 billion Euro or 48 percent. However in 2015 the level of corporate R&D-expenditure exceeded the 2002 niveau in absolute terms. With 1,7 billion Euro there was an increase of 42 percent in 2015 compared to 2002. At the same time the relations between corporate and public spending moved gradually back towards the pre-crisis structure of sources: in 2015 50 percent of financing was contributed by companies (46 percent contribution of public sector).

To get an idea of R&D-spending based on own resources of the municipality of Vienna, its corporations and other Viennese institutions specific data is provided for 2013 by the Municipal Department 23.

In this year 97,3 million Euro of R&D-spending were financed by ‘povinicial sources’ (see table 1). The

majority of the resources (94.2 million Euro) – comprising 3 percent of the total annual R&D-expenditure - was provided by the municipality of Vienna itself (see table 2). With 60 percent the largest proportion was contributed by the KAV (umbrella organisation of municipal hospitals in Vienna). Within the KAV Vienna’s largest hospital the AKH again spent almost two thirds of the R&D-budget of all public hospitals. The largest fund of the Viennese municipal government – the Vienna Business Agency – spent 14 million Euro of R&D-related expenditure in 2013 which equals 15 percent of municipal spending. Several targeted science and research promotion funds, grants and awards are managed by the municipal department 7: altogether these activities added up to nearly 9 million Euro (approximately 9 percent of municipal R&D-expenditure). The largest city-owned corporation – the Wiener Stadtwerke Holding AG (turnover approximately 3 billion Euro, 16.100 employees in the yearly average) – spent 2.4 million Euro in 2013 alone on the level of projects managed by the coordination unit for research, technology and innovation in the head office of the group.

Table 2: R&D-spending of the municipality of Vienna in 2013 (the largest contributions)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Total R&amp;D spending</td>
</tr>
<tr>
<td>Total municipality R&amp;D spending</td>
</tr>
<tr>
<td>KAV</td>
</tr>
<tr>
<td>thereof AKH</td>
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<tr>
<td>Wirtschaftsagentur</td>
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<tr>
<td>MA7</td>
</tr>
<tr>
<td>WWTF</td>
</tr>
<tr>
<td>Museen</td>
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<tr>
<td>Wr. Stadtwerke AG</td>
</tr>
</tbody>
</table>

The two federal promotion funds for basic and applied research (FWF and FFG) contributed approximately 5 percent (236 million Euro) to financing of the total R&D expenditure in Vienna in 2014\(^{25}\). In this year 56 percent of FWF-funding in Austria (117 million Euro) was awarded to grantees in Vienna. In 2015 the share of grants to Viennese researchers even rose up to nearly 60 percent\(^{26}\). In the field of applied research Vienna received 119 million Euro (19 percent of all FFG-grants) in 2014. In the follo-

wing year 2015 the total sum of grants to Vienna declined to 112 million Euro\textsuperscript{27}. However due to an also shrinking overall grant volume of FFG the relative share also rose to 24 percent representing the second largest sum after Styria.

In 2013 the corporate sector spent 54 percent (1,72 billion Euro) of the overall R&D-expenditure of 3,18 billion Euro\textsuperscript{28}. The top-ten corporations (related to the amount of R&D-spending) contributed 28 percent of overall R&D-spending. They are part of the group of large corporations (250 – more than 1.000 employees) which comprised 70 percent of the R&D-expenditure. In the year 2015 corporations spent approximately 1,94 billion Euro for R&D representing 56 percent of the overall R&D-expenditure (3,48 billion Euro). Approximately 30 percent of the total amount was spent by the top-ten corporations in Vienna. The dominance of large corporations remained unchanged (70 percent as in 2013).

In 2013 and 2015 the industry branch with by far most of the research locations in Vienna was the IT-services sector (157 and 180 respectively). In September 2014 the City of Vienna together with leading IT-corporations started the DigitalCity.Wien\textsuperscript{29} initiative which is part of and actively contributes to the implementation of the Smart City Vienna Framework Strategy. The focus of the municipal government regarding digital transformation is on active inclusion and participation of the Viennese citizens\textsuperscript{30}.

\textsuperscript{27} Data provided by 'Stabsstelle Strategie und Datenanalyse' of FFG - Österreichische Forschungsförderungsgesellschaft mbH on November 28, 2017
\textsuperscript{28} l.c.
\textsuperscript{29} https://digitalcity.wien/category/aktuell/
\textsuperscript{30} http://www.digitaleagenda.wien/
3.2 The Metropolitan Innovation System of Ljubljana (Slovenia)

The following information and data was provided by the Development Project Section in the Development Projects and Investments Office of the City Administration of the City of Ljubljana.

In April 2015 the Regional Development Agency of the Ljubljana Urban Region (RRA LUR) published the Regional Development Programme of the Ljubljana Urban Region 2014 - 2020: "The document comprises key development orientations for the Central Slovenia region (Osrednjeslovenska regija Ljubljana urban region). For the 2014-2020 period and follows the objectives of the Europe 2020 – European strategy for smart, sustainable and inclusive growth in their entirety."

With regard to the development of the metropolitan innovation ecosystem of Ljubljana the Regional Development Programme addresses a programme on “Innovation, Creativity and Knowledge for a Competitive Economy” within its “Priority 1: Regional Economic Competitiveness Growth”: "Promotion of innovation and creativity at companies is a comprehensive programme that is of key importance both on the regional and national levels. Owing to the concentration of creativity in the region, it is reasonable to promote this programme geographically in the Ljubljana urban region which has the most individuals with an innovative and creative potential and the highest concentration of creative industries.

Support and promotion of entrepreneurship relates to all forms of entrepreneurship: these range from social entrepreneurship to the entrepreneurship among the young and the highly educated unemployed labour force. Promotion of new business models is also envisaged as is the co-financing of company scholarships and the provision of favourable conditions for the acquisition of guarantees. The region will focus on the promotion of the internationalisation of companies and the strengthening of the role of Ljubljana as a European metropolis.

(...)Both fundamental pillars will develop with the strong support from ICT. Rapid development of ICT and expansion of the possibility of its use in the economy and the society are the characteristics of an international economic environment that must be taken into account by every economic entity.

This priority has the following target groups: municipalities, company consortia, R&D organisations, consortia of companies and other public institutions (the University, institutes, etc.),

32 L.c.
companies, cooperatives, entities of the entrepreneurial support environment and regional development agencies."

On the national level the entrepreneurial / innovative ecosystem is organized horizontally, but could be further segmented in relation to its effectiveness and specialization of involved actors:

- Start-up ecosystem (represented by Initiative start-up Slovenia – community of connected stakeholders, [http://www.startup.si/en-us/about-the-initiative-/who-we-are,-our-offer](http://www.startup.si/en-us/about-the-initiative-/who-we-are,-our-offer))
- Entrepreneurial ecosystem, including various initiatives as Scale-up initiative, Competence centers (represented by industry leaders and industry clusters), Technology Transfer Office Network (coordinated by Jožef Stefan Institute), Industry associations (Chamber of commerce Slovenia), etc.
- Creative and social entrepreneurship ecosystem (the most visible and internationally recognized creative hub is in Ljubljana: Poligon [http://www.poligon.si/en/](http://www.poligon.si/en/) the new national level initiative Center for creativity of Slovenia – coordinated by Museum of Architecture and Design and supported by Technology park Ljubljana Ltd has been launched in June 2017)

The importance of an entrepreneurial / innovative ecosystem is recognized also by S3 strategy and is integral part of S3 pilot projects.

There is no formal innovation ecosystem on the level of the Municipality of Ljubljana. However Ljubljana represents a vibrant entrepreneurial community with a sub-ecosystem that could be described as technology-based community and is mainly concentrated in the hub of the Technology Park Ljubljana Brdo ([http://www.tp-lj.si/en](http://www.tp-lj.si/en); with main shareholder being Municipality of Ljubljana) and also on locations in the vicinity of Joze Stefan Institute or/and the university campus. Moreover, most of the key actors in accordance with quadruple helix methodology is concentrated in Ljubljana region:

- National / regional development agencies
- Largest University and research institutes as well as University Medical Centre Ljubljana
- Financial institutions, industry leaders, a great portion of large companies and multinational’s subsidiaries, ...
- Civil and entrepreneurial societies, alliances, networks

Technology Park Ljubljana Ltd (TPLJ) could be viewed upon as a Smart City with +300 member companies, innovative teams and individuals offering:

- 75.000 m2 of high-quality infrastructure in 2 locations
- Hosting 300+ member companies with 1.500+ employees
- Smart city & living services and programs
• Network of FabLabs & OpenLabs

TPLJ is a key actor of national innovation support ecosystem as it co-creates, delivers and implements services within:

- **Start:up Slovenia initiative**
  Developing legislation and support incentives for startups:
  • 3 national and 5 regional startup support programs
  • 3,5+ mio EUR investments in 60+ startups managed annually for SEF
  • 150+ experts, business mentors and start-up coaches
  • Largest startup conference in Western Balkans
  • Start:up AlpeAdria Initiative lead partner
  • European Startup Network funding member

- **Scale:up Slovenia initiative**
  Creating and developing legislation and support incentives for growing SMEs

- **Numerous Pilot projects**
  Developing **innovation support** incentives for public research and knowledge organizations and big enterprises, including soft-landing services.

Most of the support instruments, programs and financial incentives are available on national level, targeting 2 cohesion regions. However, since most of the key business support organizations and authorities are located in the capital city, a broad range of services supporting innovativeness are available for beneficiaries in Ljubljana:

- Specialized workshops and events (including Rector award for best innovation at University of Ljubljana)
- 2 Public acceleration programs (coordinated by TPLJ) and supported with (1) convertible loan; 75K€ and (2) seed investment 200K€ provided by Slovene Enterprise Fund (Public Agency)
- Several financial incentives covering needs of technology oriented SME throughout company lifecycle [http://www.podjetniskisklad.si/en/](http://www.podjetniskisklad.si/en/)
- Private Accelerator supported by industry partners from Ljubljana area [https://abc-accelerator.com/](https://abc-accelerator.com/)
- Subsidies for co-financing of market research, co-financing of attendance at fairs, ...
- Services of competence centers (i.e. Design Thinking Competence Centre [https://www.design-management.si/en/](https://www.design-management.si/en/))
- Network of fab-labs (initiated by Faculty of Electrical engineering at University of Ljubljana and partnered by almost 80 actors, one of the main partners being TPLJ)
- University Incubator Ljubljana
- National program for self-employment
- Social entrepreneurship incentives
- Co-financing of green / tech solutions
- Access to financial actors / networks as banks, SIB, business angels, VC actors including Silicon Gardens Initiatives
- Media coverage / several business-related platforms
- SRIP / projects under the umbrella of Smart specialization strategy.

Most of above mentioned services are promoted or implemented also by Technology Park Ljubljana. Moreover, on the local level Municipality of Ljubljana serves as a testing platform for several technology solutions (i.e. projects with young’s, cooperation with Elaphe, Visionect and others.) The Municipality of Ljubljana is also cooperating with high technology companies within different EU projects.

3.3 The Metropolitan Innovation System of Podgorica (Montenegro)

During the data collection phase for this analysis there was an email contact with the office of Mr. Dragutin Djekovic, the City Manager in the Capital City of Podgorica. This connection was facilitated by NALAS. However due to resource constraints the municipal government of Podgorica was not able to provide the requested data to describe details of the innovation system of Podgorica.

Given that out of a total population of 0.6 million people in Montenegro (2011: 625,883, estimation: 678,931 in 2017\(^3\)) approximately 30 percent (population in 2011: 185,937\(^3\)) live in the metropolitan area of the capital city Podgorica we assume for this analysis, that data on the national innovation system can be taken as approximative reference also for the metropolitan innovation system of Podgorica.

Based on the WBC-INCO.NET "Report on the mapping of the WBC Innovation infrastructures - Montenegro"\(^3\) from 2011 the following actors constituting the innovation ecosystem could be identified (citations of the report below). There was no more recent data available:

**Key national agencies**

1. **Agency for International Co-operation of Montenegro (ZAMTES)**

   The Agency for International Co-operation of Montenegro is an institution of the Government of Montenegro which was established approximately 30 years ago. The Agency consists of the following organisational units:

   - Department for International Scientific, Educational, Cultural and Technical Cooperation; and
   - Department for General and Financial Issues.

   The Department for International Scientific and Technical Co-operation performs the following duties:

   - Preparation, co-ordination and implementation of the S&T programs and projects of scientific and technical nature;
   - Initiation and co-ordination of the establishment of immediate collaboration between Montenegro and foreign institutions and industrial organisations;
   - Participation in the preparation of multilateral and bilateral programs on the basis of which RTD projects in Montenegro are being realized; and

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\(^3\) [https://en.wikipedia.org/wiki/Montenegro](https://en.wikipedia.org/wiki/Montenegro)
\(^3\) [https://en.wikipedia.org/wiki/Podgorica#Demographics](https://en.wikipedia.org/wiki/Podgorica#Demographics)
• Professional training abroad within multilateral and bilateral programs, organisation of international conferences, gatherings and seminars.

2. Directorate for Development of Small and Medium Sized Enterprises (DDSME)

Next to the Ministry of Economy, the main institution for the realisation of the policy and for providing support for SMEs in Montenegro is the Directorate for Development of Small and Medium-sized Enterprises (DDSME) which was established in 2000 and officially started its operation in February 2001.

Its area of activity is twofold: On one hand, it provides support for SMEs at the executive level through the realisation of activities and projects in the area of developing support institutions, promoting information flow with SMEs, providing necessary consultative business services and education, securing grants for SMEs, stimulating competitiveness and export, internationalisation of SMEs, supporting research and also promotion; on the other hand, it plays a leading role in coordinating the implementation of SME policy within the framework of other sector policies, in the parts which deal with the development of entrepreneurship and also in activities of other entities which, within their sphere of activities, support the development of SMEs.

DDSME provided credit and loan support through the following programmes for SMEs: “Encouraging Entrepreneurship” in 2006, “Encouraging Competitiveness and Export” in 2007, and the “Programme of State Aid and Support to Small and Medium-sized Enterprises” in 2008 and 2009 (MoE 2010a:16). A special focus is thereby given to start-ups, entrepreneurs planning to start up new production or services and SMEs being operational up to one year through the programme “Encouraging the Beginners in Business-Start-up”.

DDSME created Strategy for the Development of Small and Medium Sized Enterprises 2011-2015. To this end, the strategy pursues the following strategic objectives:

1. Improving the business environment
2. Strengthening financial support
3. Strengthening the competitiveness of SMEs and promotion of entrepreneurship
4. Support for Beginners in Business – Start-ups

3. Montenegrin Investment Promotion Agency (MIPA)

The Montenegrin Investment Promotion Agency (MIPA) is a national investment agency set up by the Government of Montenegro in order to promote foreign investments in Montenegro and to facilitate the economic development of Montenegro. The Agency was established in 2005. The mission of MIPA is to partner with foreign and domestic investors, the public and private sector, and inter-
national groups and individuals to increase investments in Montenegro and help bring accelerated economic development, dynamic growth and prosperity for all Montenegrin citizens. The Agency promotes specific projects to foreign investors and has a publicity function in bringing such projects to the attention of the international public. MIPA advances Montenegro as a competitive investment destination by actively facilitating investment projects in the country.

Technology/Innovation Centres (TICS)

1. European Information and Innovation Centre Montenegro (EIICM)

EIICM provides services for fostering innovation, knowledge and technology transfer, as well as services encouraging participation of SMEs within EU Framework Programmes for research and technological development. In detail, its activities encompass:

- Services of innovations, knowledge and technology transfer:
  - Distribution of information to raise levels of knowledge on policies referring to innovations, legislation and support programmes;
  - Distribution and utilization of research results;
  - Provision of intermediary services for technology and knowledge transfer and building partnerships between all those involved in the innovation field;
  - Encouraging business capacities to innovate

- Services that encourage participation of SMEs in the Community Framework Programmes for Research and Technological Development:
  - Raising level of knowledge for SMEs on Community Framework Programmes
  - Supporting SMEs to identify their RTD needs and find relevant partners; and
  - Supporting SMEs in the preparation and coordination of project proposals for the participation in Community Framework Programmes for research and technological development.

2. R&D Service Centre at the University of Montenegro (UOM)

Established in October 2010, the RTD service centre at the University is the first attempt to foster the income of external project funding at the University with the clear idea to transform it into the first nucleus of Technology transfer. The centre’s main objectives are to assist researchers in finding and applying for funds, support them in project management, collaboration with industry, commercialization of research and connecting them with partners for scientific research projects.

The list of services that the R&D SC is already offering includes management of existing projects (various EU projects, industry projects, etc.), support in development and contracting of new projects, consultancy and support in writing new project proposals and fundraising (incl. feasibility study, etc.), coordination of bigger multidisciplinary groups inside UoM for new project ideas, disseminati-
on of information about available funds, open calls, etc., organization of various lessons, trainings, events, workshops, and partner search for new projects.

Its future profile is going to be a little bit redefined with a broader set of activities including also the matter of legal ownership of start-ups, project results and certain issues concerning the intellectual property rights.

The list of services offered by R&D SC is to gradually increase and to include the establishment and running of new research centres inside UoM, new contracts and research projects with industry partners, participation in establishment and running spin-off companies, consultancy in intellectual property legislative (including licensing, patenting, etc.), and possibly formation of small incubator for start-up companies with innovative ideas.

Clusters

Meat Processing Cluster Initiative

Business Start-Up Centres/ Technology Incubators

1. Business Incubator Berane
2. Business Start-Up Centre and Incubator Bar
3. IT Business Incubator Podgorica, d.o.o. Inventivnost
4. Network of Regional and Local Business Centres
3.4 The Metropolitan Innovation System of Tirana (Albania)

During the data collection phase for this analysis there was an email contact with the office of Mr. Arbi Mazniku, the Deputy Mayor of Tirana Municipality in Albania. The contact was provided by NALAS. However the municipal government of Tirana was not able to provide the requested data regarding the innovation system of Tirana.

Given that out of a total population of 3 million people in Albania (as of 2016\(^\text{36}\) ) approximately 27 percent (population in 2011: 749,365, projection for 2017: 862,361) live in the metropolitan area of the capital city Tirana we assume for this analysis, that data on the national innovation system can be taken as approximative reference also for the metropolitan innovation system of Tirana\(^\text{37}\). The capital city is “the economic heart of Albania and home to most major national and international companies operating in the country. The economy is dominated by the service sector with around 68.5%, the industrial sector by 26.1% and agriculture sector with 5.4%.”\(^\text{38}\)

In 2015 the innovation portal of the region Marche in Italy published information about Albania’s national innovation system\(^\text{39}\): “Albania Government has made significant progress in transition reforms in recent years. The government has actively promoted pro business and investment policies on innovation technology and in society information. With the reform of the research system, since 2006 and the adoption of the National Strategy of Science, Technology and Innovation (NSSTI) 2009-2015 in July 2009 there were introduced major changes to improve the effectiveness of the country’s innovation system. Important steps were made in terms of establishing institutions and developing a strategy for a national innovation system. The Albanian Government has focused on ICT as a main driver of economic, political and social development in the country, evolving from a low-tech, inwardly looking state to a potential regional leader in e-Government, and connectivity, particularly as major infrastructural investments are being made.

On the business front, the Strategic Programme for Innovation and Technology Development for SMEs 2011-2016 approved in February 2011 and its Action Plan, the Business Innovation and Technology Strategy (BITS), represent the main policy measures of the Ministry for Economy, Trade and Energy (METE) for promoting Innovation and technology dissemination in Albanian SMEs. The Business Relay and Innovation Centre (BRIC) will be the executive arm of METE for the implementation of the strategy

\(^{36}\) https://en.wikipedia.org/wiki/Albania
\(^{37}\) https://en.wikipedia.org/wiki/Tirana
\(^{38}\) L.c.
\(^{39}\) http://www.marcheinnovazione.it/en/node/5839
and will provide both technical assistance and financial support for companies to engage in innovation.

A list of the main agencies with an active role in the growth of innovation in Albania follows.

- **PROTIK**: The Protik ICT Resource Center is established by the combined efforts and goals of the Government of Albania, USAID, Albanian-American Development Foundation (AADF), Microsoft, Cisco, and Albtelecom. Established as a local non-for-profit organization on October 10th, 2012, Protik’s mission is to catalyze the development of the information and communications technology (ICT) sector in Albania. Protik aims to become the Albanian ICT hub: a connection point for those seeking the latest and most innovative ideas, products, and services.

- **ARTI**: The Agency for Research, Technology and Innovation (ARTI) is a public, legal institution under the competences of the Council of Ministers. ARTI is established with the Decision of Council of Ministers and has started its activity in March 2010. ARTI aims to build a modern system of science, strengthen of research and technology, as well as their integration inside the higher education system. ARTI facilitates the exchanging of knowledge, mutual activities and partnership within and outside the country. ARTI as a coordinating and guiding structure which cooperates with institutions in the field of science and technology for sustainable development of the country, in line with national priorities, development of scientific and technological policies and management of Research and Development (R&D) institutes.

- **National Agency on the Information Society**: The National Agency on the Information Society was established by the Government Decision N.248, on 27.04.2007, amended. The main goal of NAIS:
  a) Application of the policies and strategies, for the development of the information society sector, and in particular the technology of information and communication;
  b) Cooperation of both programmes in the field of society information and technology;
  c) Promote the investments in the field of information society; Draft the competences of Minister of Innovation, given by law, in the field of electronic communications;
  d) Promote new technologies in the field of information society;
  e) Give contribution on education and use of the information technology by the public;

- **ADRIATINN**: Under the partnership of UNYT (University of New York in Tirana) the project goal is to build innovation, cross-border clusters of SMEs and R&D Institutes, which interact with each other and with clients and suppliers and often share a pool of specialist labor, business and financial services, R&D and training facilities. Promote lifelong learning in research and innovation; the universities of the area will help the commercialization of research results by increasing the entrepreneurial mind-set of students and by collaborating with regional SMEs. Capitalize the advantages of the area: bio-economy and energy sectors can help to: boost local economies; stimulate new activities; create new and sustainable jobs; have important spill-over effects on other industries; and en-
hance the attractiveness of regions and cities. The interregional cooperation project will ensure that both “old” and “wannabe” entrepreneurs will reach their full potential.

- **ALBANIAN MINISTRY OF INNOVATION**

In a country report on the “Science, Technology and Innovation and Innovation System in Republic of Albania” in 2006 the authors point out that⁴⁰ „The government institution responsible for managing, planning and financing of public R&D activities is the Ministry of Education & Science (MoES). The Academy of Sciences (ASA), as an independent institution, receives funds from the government approved by the Parliament. Albania has no specific funds or agencies that are responsible for financing R&D activities, but a national competitive R&D programme is operating on behalf of the ministry including co-operative processes with ASA and other research institutions concerning priority setting of the national programme. Besides MoES there are other relevant intermediary institutions and research performers of the Albanian STI-system“.

In the meantime the national innovation system moves towards a triple helix setting⁴¹. In another analysis the key-players of the innovation system were described as follows⁴²:

1. Innovation-related government institutions
2. Governmental programmes and policy
3. Technology and Innovation Centres
4. Innovation Clusters
5. Technology and Science Parks
6. Business Start-up
7. Technology Incubators
8. Higher education and research institutions
9. International organisations

In 2013 the World Bank published the following details⁴³: „Eleven public and 31 private HEIs have a mandate for tertiary education, scientific research, development, and transfer of knowledge and technology, although the duration and level of scientific research among the universities differs. Integrated with public universities in Tirana are three Public Centers/Agencies for development and technology transfer.“

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⁴¹ [http://www.triplehelixconference.org/th/11/bic/docs/Presentations/Theme%203/Curraj%20&%20Bino.pdf](http://www.triplehelixconference.org/th/11/bic/docs/Presentations/Theme%203/Curraj%20&%20Bino.pdf)
In recent years also accelerators like GARAZH (The Garage [www.garazh.xyz](http://www.garazh.xyz)) and coworking spaces like Talent Garden Tirana ([https://tirana.talentgarden.org/](https://tirana.talentgarden.org/)) have started to contribute to the metropolitan innovation ecosystem of Tirana.\(^44\)

In its „Western Balkans Regional R&D Strategy for Innovation - Country Paper Series Albania“ the World Bank states in 2013 the following about R&D-expenditure of corporations and the science-industry links in the Albanian innovation system\(^45\): „Private sector investment in Science and Technology (S&T) in Albania is extremely low. There are only about 750 medium and larger companies in the country, and the sector tilts heavily towards low technology activities, while exports are low in both absolute and relative terms. Micro-enterprises with fewer than five employees make up the vast majority of private businesses. Their survival strategy focuses on labor-intensive, low-cost production. Industry-university collaboration in Albania is among the lowest in the world. In 2012, Albania ranked 139 out of 144 countries. This constrains opportunities for growth and represents an untapped knowledge potential for innovation.“

### 3.5 The Metropolitan Innovation System of Chisinau (Moldova)

With the support of the office of EUSDR PA 10 in Vienna a contact to the Policy Analysis, Monitoring and Evaluation Department within the Ministry of Agriculture, Regional Development and Environment of the Republic of Moldova was established. The Ministry again facilitated in principle a contact to the office of the Interim Mayor (Deputy Mayor) Mr. Grozavu Nistor. However the contact was interrupted because he resigned. On the level of the ministry further support was not possible due to an ongoing restructuring process (central administration reform).

Given a comparable situation with the cities in Western Balkan Countries - small country with 4 million population, economic activity concentrated in Chisinau (– 50% of GDP\(^46\)), Chişinău metropolitan area\(^47\) had 662,836 inhabitants in 2014 (this is 22 percent of the total population of Moldova\(^48\)) - we also assume in this case, that information regarding the NIS can be taken as approximative indication for the MIS of Chisinau. As described in a recent H2020 PSF Peer Review of the Moldovan Research and Innovation system „Moldova is the poorest European country in terms of GDP per capita, which

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\(^45\) L.c.

\(^46\) [https://era.gv.at/object/document/2505/attach/MD_Peer_Review_preliminary_for_ERAC_FINAL.pdf](https://era.gv.at/object/document/2505/attach/MD_Peer_Review_preliminary_for_ERAC_FINAL.pdf)

\(^47\) [https://en.wikipedia.org/wiki/Chi%CF%83%9in%C4%83](https://en.wikipedia.org/wiki/Chi%CF%83%9in%C4%83)

\(^48\) [https://en.wikipedia.org/wiki/Moldova](https://en.wikipedia.org/wiki/Moldova)
reached only $2,239 in 2015". In a nutshell the innovation ecosystem of Moldova is described in the final report describing its severe limitations: "The Moldovan R&I system presents several structural weaknesses such as low financing, ageing, migration and downsizing of the R&D personnel, a weak link to society’s needs and challenges, insufficient possibilities for universities to perform adequate research, an almost inexistent involvement of the private sector and, last but not least, a rather unusual governance structure". As further outlined the "current governance attaches a central role of the Academy of Sciences. The Academy is the main policy-making institution and fulfills - to a large extent - the role of a Ministry of Science". The R&D intensity with regard to public funding is reported to having "declined to 0.4% in 2011 (GERD as share of GDP). For 2014, ASM reported data indicate that the share of GDP further dropped to a moderate 0.35%" which "leads to a marginalization of R&I capacity building and its potential to contribute to economic growth in the country". With regard to sectors of R&D-performance those are dominated (in 2013) by government related R&D expenditure (approximately 70%) marginalizing the universities (10%) and the corporate sector (20%) accompanied by an almost inexistent private non-profit sector. Although it may be estimated that the main source of funding is the Moldovan government the sources of R&D funding finally remain opaque given that data by business sector is not available.

4 Conclusions and Recommendations

The findings of this study suggest room for improvements with regard to communication between officials of the municipal governments in the metropolises investigated and the external, international world in general as well as with regard to governance structures and data availability in specific.

The study shows that in Western Balkan metropolises – compared to the selected peer municipalities Ljubljana and Vienna – data describing the structure, status quo and investments of the Metropolitan Innovation Systems is not available in a structured and continuous manner for city managers, international comparison and investors. Furthermore neither in Chisinau nor in Podgorica and Tirana any kind of strategic framework exists that is formalized and communicated to the general public compared to the strategic frameworks presented on the municipal government’s websites of Ljubljana and Vienna.

Although in the case of Tirana statistics on the budget and financial data on municipal level obviously are available the information is not provided in English. In an ongoing project on the 'The Municipal Financial Data Portal' for 61 municipalities in Albania also municipal financial data (revenues and expenditures50) of Tirana is provided. The framework implemented and the statistical financial data collected is based on a "previous cooperation with Ministry of Finance and the Minister of State for Local Government which led to the launch of the already operative digital platform www.financatvendore.al. It contains financial data at the local administrative units’ levels and provides a "systematic Monitoring of the Financial Situation and Practices of Financial Management at the Local Level". 51 With regard to the implementation of continuous monitoring, key performance information (data, indicators) and transparency the need for improvements is also addressed in some of the most recent publications of the World Bank dealing with necessary reforms and a structural change agenda in the Western Balkans (World Bank 2017 a, b).

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50 www.financatvendore.al
4.1 Recommendations

Based on the results of this study and the comparison of the metropolises and municipal governance performance of Podgorica (Montenegro), Tirana (Albania) and Chisinau (Moldavia) with the peer cities Ljubljana (Slovenia) and Vienna (Austria) the following recommendations would open up room for improvements:

1. Metropolitan strategy development:
   Compared to Ljubljana and Vienna as potential blueprints the municipal governments of Podgorica, Tirana and Chisinau should set-up a strategy development process within a specific time horizon to provide mid- and longterm goals for the development of the Metropolitan Innovation System.

2. Statistical data and transparency:
   Again compared to the peer cities the municipal governments of Podgorica, Tirana and Chisinau should implement and continuously maintain a statistical framework and key data sets on municipal level in order to provide for monitoring of performance of public service delivery lines, expenditures and investments. This would also create more transparency towards the regional stakeholders and potential investors.

3. Transparency and communication:
   The local government authorities of the three cities should strive for continuous improvement of their communication procedures and create transparent staff responsibilities as well as (single) points of contact for external requests. Key statistical data should be provided on a regular basis (for instance biannual) in English on the municipal government’s websites.

These recommendations are in line with the results of the discussion in the panel session ‘Activating Local Economy’ chaired by Alexander G. Welzl (EUPRO) – the author of this study - during the ‘Danube Governance Forum - Improving Governance Together’ on December 4, 2017 in Vienna.

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52 Results of panel session ‘Activating Local Economy’: http://www.bacid.eu/images/7/7a/Session2_Table2.pdf
5 Literature


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Welzl, A.G. on February 2015, contributions as discussant at the panel on ‘Better spending: can the EU budget be more effective?’ Workshop ‘Efficiency and Effectiveness of the EU Budget’ at the European University Institute (EUI), 1-2 October 2015, Florence, Italy. [https://apps.eui.eu/Events/download.jsp?FILE_ID=8765](https://apps.eui.eu/Events/download.jsp?FILE_ID=8765)


ANNEX - Questionnaire for Local Government Authorities

Metropolitan Innovation Systems (MIS) of Capital Cities in Western Balkan Countries and Moldova – Baseline Assessment and Potential Capacity Building in the EU-Context

Questionnaire for Local Government Authorities
October 2017

See the study description online:

http://www.bacid.eu/Metropolitan_Innovation_Systems_(MIS)_of_Capital_Cities_in_Western_Balkan_Countries_and_Moldova_%E2%80%93_Baseline_Assessment_and_Potential_Capacity_Building_in_the_EU-Context

The Action is funded by the Austrian Development Agency (ADA) through the BACID grant scheme (Building Administrative Capacities in Danube Region & Western Balkans), managed by the Austrian Association of Cities and Towns (AACT) and KDZ Center for Public Administration Research.
The following questions should be answered based on this questionnaire:

1. What is the initial status quo of the Metropolitan Innovation Systems (MIS) in place in the capital cities of Tirana (Albania), Podgorica (Montenegro) and Chișinău (Moldova)?

2. What are their projections/plans (strategies) in this area?

3. Which are the currently used instruments, programmes and structures (municipal service delivery areas, players in the innovation ecosystem) in the three selected metropolises in Western Balkans and Moldova compared to Ljubljana/Slovenia and Vienna/Austria?

4. Which are the existing capital flows of foreign direct investments (FDI) from EU, USA, Asia (China) and other countries to be invested in infrastructure and innovation on metropolitan level (including funding from International Finance Institutions like World Bank and EIB)?

The design and goals of this study correspond to the survey and report on ‘Local innovation ecosystems‘ published by the EUROCITIES ‘Working Group Innovation‘ in September 2017: http://nws.eurocities.eu/MediaShell/media/Final_draft_report_on_LIE_8_final.pdf
Question 1: Strategy and mid-term development of the metropolitan innovation ecosystem

a) What does ‘innovation‘ mean in the context of your capital city?

b) Do you have a mid-term innovation strategy for your capital city?

For example: ‘Innovative Vienna 2020’
Question 2: Structure & Processes of the metropolitan innovation ecosystem

a) Please describe local government departments, public funding and business promotion agencies as well as funding programmes which are part of the innovation ecosystem:

b) Which are the other players in the innovation ecosystem of your capital city? (eg SMEs, corporations, banks, schools, universities, technology parks, incubators, citizens)
Question 3: Financing of the metropolitan innovation ecosystem

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<tr>
<th>a) Please describe the R&amp;D-spending (capital flows) in your city in 2015 and 2016 (if possible):</th>
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<tbody>
<tr>
<td>1. Private sector R&amp;D-spending (volume and percentage of the sum of R&amp;D-spending):</td>
</tr>
<tr>
<td>2. Public sector R&amp;D-spending (volume and percentage of the sum of R&amp;D-spending):</td>
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<tr>
<td>3. Foreign investments including International Finance Institutions but without EU (volume and percentage of the sum of R&amp;D-spending):</td>
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<tr>
<td>4. EU-financing (volume and percentage of the sum of R&amp;D-spending):</td>
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<th>b) Please describe foreign direct investment (FDI) capital flows in 2015 and 2016 (if possible):</th>
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<tbody>
<tr>
<td>1. Corporate spending (volume and percentage by country)</td>
</tr>
<tr>
<td>2. International Finance Institutions (volume and percentage by institution eg. World Bank)</td>
</tr>
<tr>
<td>Question 4: Digital transformation &amp; Start-ups (Fintechs)</td>
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| **a)** How does the digitalisation take place in the innovation ecosystem of your capital city?  
  e.g. are there internet-based government services? |
| **b)** Are there start-ups, start-up platforms and fintechs  
  (internet-based financial start-ups)? |
In case of further enquiries please get in touch with:

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THANK YOU FOR YOUR COOPERATION!