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Towards multidisciplinary analysis of local public service economics and management
Social and Network Services in Central Europe

Local (Public) Services in Central Europe.
Study in economics and management.

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Contents

Executive summary

1. The main objective of the presented study is two-fold. First of all, it is the challenge of cost analysis on local public service across countries of Central Europe. Secondly, it is an issue of cost relations to demographic changes that has been questioned. The approach requested theoretical discussion and methodological framework delivery (chapter 1) as well as empirical studies that have not been previously carried out in Central Europe (chapters 2 and 3).

2. The study has been inspired by the authorities of the Central Europe Programme who in 2010 pinpointed that:

> *"At EU level demographic changes (e.g. ageing, migration, population losses) are among the issues addressed by the Territorial Agenda. Due to less migration surplus and a negative natural population development demographic and social changes influence urban and rural structures. They affect life style patterns, location decisions and have also significant territorial implications for urban and regional spatial structures, for housing markets, for infrastructures and also for decision-making processes."*[1]

and as a consequence requested actions to be set up in Central Europe on:

> *"…better transnational strategies to stabilise or reduce infrastructure costs under the conditions of stagnation and shrinkage; better solutions of urban and regional planning in Central Europe to handle infrastructure costs as limiting factor for the room for manoeuvre regarding and regional development; more refined downsizing and restructuring measures in order to qualify the surrounding area of formerly densely populated urban structures; improved image and reputation of shrinking regions or cities in terms of public awareness; deepened understanding on the impact of shrinking regions on other regions and cities (e.g. growing cities/regions and their challenges regarding mobility, infrastructure, housing issues); improved and more holistic approaches to counterbalance depopulation trends."*[2]

[1] Project Concept 7: Improved governance and management of infrastructures and services in regions and cities affected by demographic change. Annex to the announcement of a restricted call for strategic projects, Central Europe Programme, 12.07.2010
[2] Ibid.

The ADAPT2DC project (New innovative solutions to adapt governance and management of public infrastructures to demographic change) has been launched to answer the call. The presented study has been implemented within the project as an attempt to deliver economic background to policy recommendations.

3. Demography and cost of public service are interrelated within the supply-demand logic of public service delivery. Nevertheless, the linkages are not linear and provoke many research questions. To decompose the variables that play role, the supply-side issues of economics of public service and political & management impacts over the territorial system needs to be well known. The same applies to the demand-side characteristics and its demographic parameters. The changes of population, and more importantly the knowledge on population structure and natural growth factor become one of the key issues for the service providers to deal with the economics of public infrastructure provision. Demographic trends impact the provision of public infrastructure in four fields. (1) Apart from many other growth-significant factors of the territorial development, the declining and active population in the labour market reduces the revenue side of public budgets that in turns affects income-related tax takes. (2) The size of the users grouped according to the service demand influences overall economic performance of the providers of public services, regardless their ownership. (3) The ageing is widely believed to make changes to the structure of demand for public goods, even though it is not a simple change in consumption. (4) Cost-efficiency is deep-rooted in fixed costs of infrastructure that once reduced may result in average gaining. The hypotheses that orientate the research are: (1) the cost of local public services is significantly correlated to population change and (2) volume and demography are not the exclusive change factors behind the cost shifts of public service in Central European countries.

4. The original study assumptions encompassed two pillars of analysis: the first one referring to collecting and comparing data on local service delivery costs across Central Europe (chapter 2); and the other one looking at case-based details of service delivery with regards to demographic change (chapter 3). First of the approaches evolved in time. It was due to the fact that neither Eurostat and Espon nor national statistics offered relevant and comparable data at NUTS3 or LAU levels. Consequently, a tailor-fit model was elaborated and implemented. The so called proxy cost ratio (PCR) was calculated using the business intelligence data. The ratio remains at the heart of the study, even though bottlenecks of the approach has been indentified. The PCR – calculated for five thematic fields, i.e. social care, health care, public housing, public transport as well as water and sewage – was presented for

Central Europe at NUTS3 level and further statistically tested against demographic change, spatial and economic parameters. The second approach makes use of theoretical assumptions presented in chapter 1 that were converted to case-based specific studies in thematic fields. It is understood as a complementary method to provide testing of public service adaptation to changing demographic situation in terms of public sector economics and policy making. The 14 field studies have been set-up in order to enable better understanding of particular determinants of changes in infrastructure and service costs; especially those related to demographic changes. The activity was meant as a microeconomic analysis of sample cases in infrastructure and service provision basically in shrinking areas, comparative in groups of two-three LAU1 and / or LAU2 cases. The characteristics of the offered products and their value chains have been investigated in terms of standards, technology, management and financing. It has made possible the extensive understanding of supply side of the service delivery. To complete the picture of service specifics, the description of the demand has been incorporated. The comparisons have been done referring to trends and tendencies with wide context analysis.

5. The analysis of qualitative nature indicate that public service cost comparison across the Central European countries should not be done in any kind of direct way. In other words, in pillar 1, lower PCR levels are no necessarily better than higher or the other way. The PCR proposed here is rather "neutral" in a meaning that it shows certain comparable value of service delivered to citizens. It means that NUTS3 regions has been described by a value of service sold in the investigated fields. It is not the price of the service but it shows sales of specific services per inhabitant of territory. While the efficiency issue is also conditioned by e.g.: organisational settings, legal schemes, spatial characteristics, technical standards and novelty. Taking them into consideration in qualitative studies allow much better picture and proper insight into the issues of public service economics. Five detailed observations follow. For health care the greatest spatial variation of ratio was recorded in Germany. The ratio shows some regularity. The highest values in most countries are usually in large urban areas: Bratislava, Kosice (SK), Graz (AT), Budapest (HU), Kraków, Poznań (PL). In case of water and sewage the PCR values are quite diverse in Central European countries. There are some nationally observable peaks but they may simply result from concentration of large suppliers of service. Concerning public transport the highest value of ratio can be observed in Western parts of Austria and some regions in Germany. A limited study in housing was possible only for most regions in Poland and Germany. The values of ratio are higher only in some large

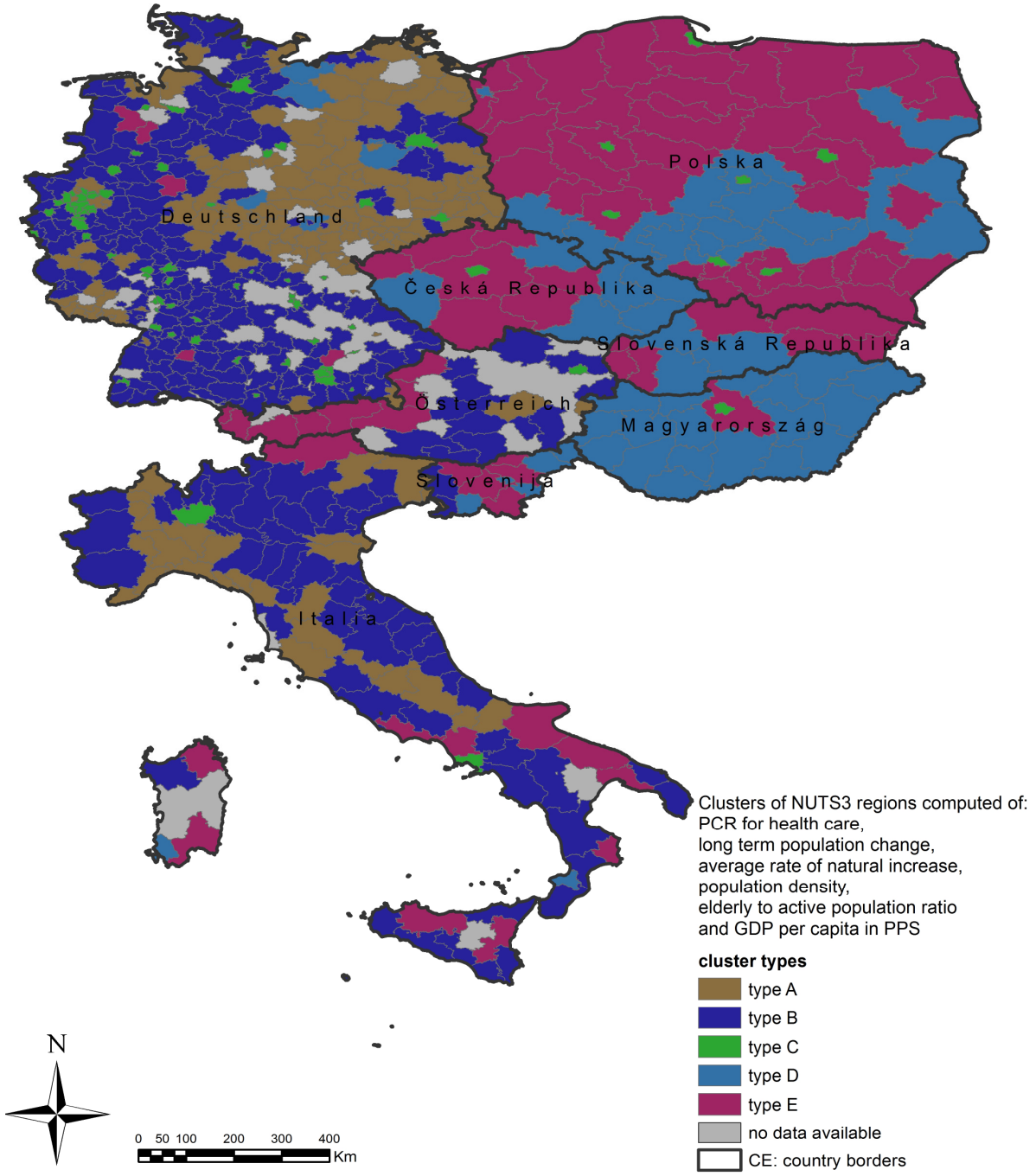
urban areas, such as: Gdańsk, Warszawa, Katowice, Wrocław, Szczecin. In Germany, the observed ratio is more spatially diverse than in Poland. PCR on social care was only calculated for four CE countries. The most diverse level of ratio can be observed in Germany. All the PCRs have been calculated as a base for further analysis against demographic changes as well as other economic and spatial characteristics of the NUTS3 territories.

6. The analysis for all available PCR observations in Central Europe shows that the ratios are for all cases negatively correlated with long term population changes (not significantly correlated for social care). The PCRs are also positively correlated with population density (not significantly for water and sewage). The PCR for public housing is significantly correlated with all the analyzed variables (long term population change, medium term population change, average rate of natural increase, population density elderly to active ratio, GDP per capita. PCR for health care is significantly correlated with all variables but elderly to active ratio. In the used data set concerning Central Europe all PCRs apart from the water and sewage proxy cost ratio, are significantly correlated with population density. Moreover numerous contextual and qualitative premises pinpoint that public service provision relies much upon the spatial characteristics of the territory. For this reason focused mapping and statistical tests have been done with reference to: predominantly urban regions, intermediate regions and predominantly rural regions, according to the classification provided by Eurostat. Also, the method has been applied to nationally tested variables.

7. The most importantly, a clustering of NUTS3 territories was proposed based upon PCRs and economic, spatial and demographic variables. The core of the idea was to cluster similar regions and enable the pursuit of solutions. The suggested taxonomy creates an opportunity for policy actors and service operators of clustered territories to consequently share relevant knowledge and best practices needed to adapt to demographic change.

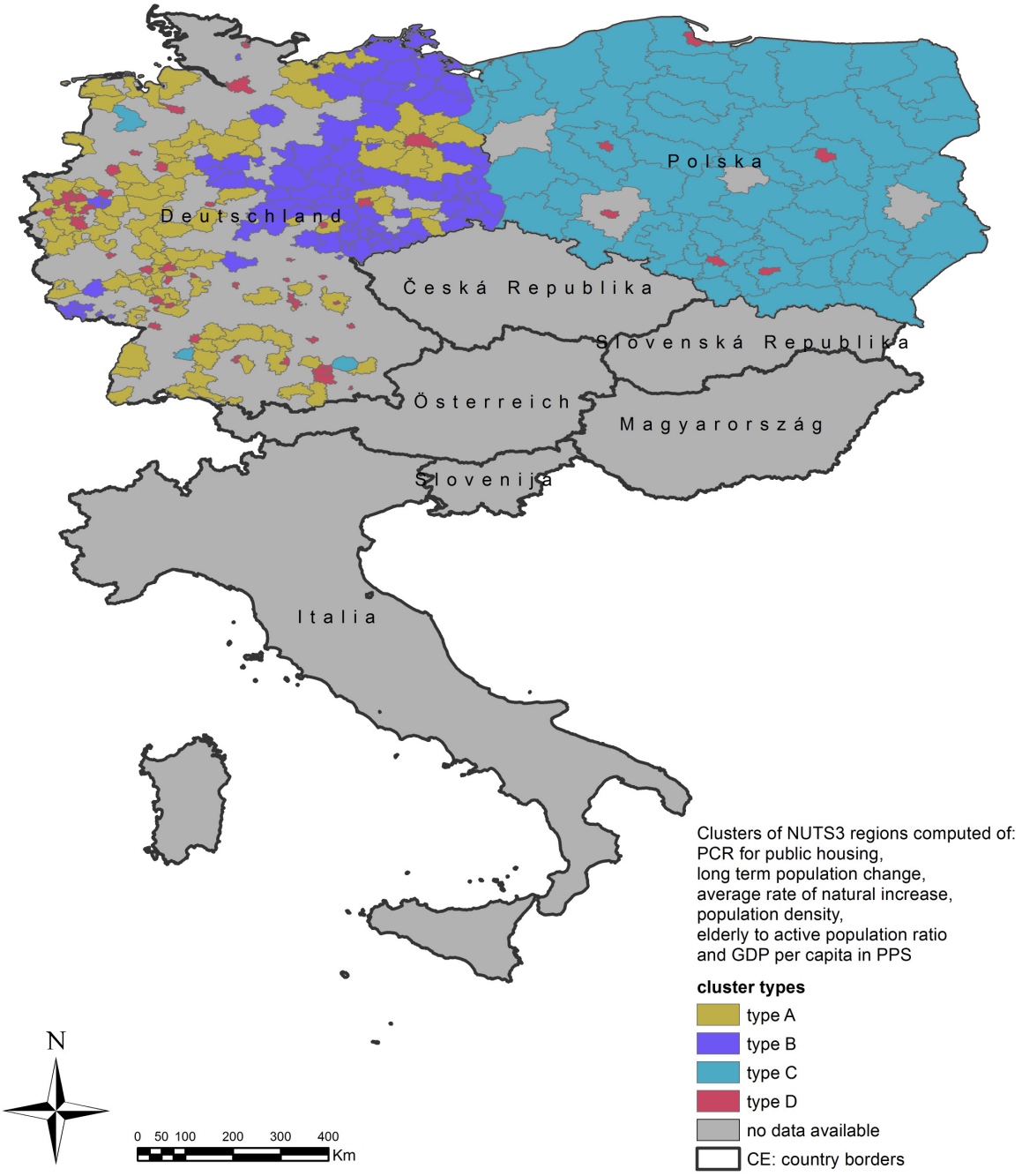
In case of heath care sector, we can observe clear division of Central European countries on group in which clusters type E and D are dominant, and group with clusters type A and B. The first group consists of Poland, Slovakia, Czech Republic and Hungary. The second group consist of Germany, Italy. However in this counties there are some regions of different types. Austria and Slovenia are most diverse countries taking into account clusters types.

Clusters of similar regions in Central Europe according to health care proxy cost and other variables



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

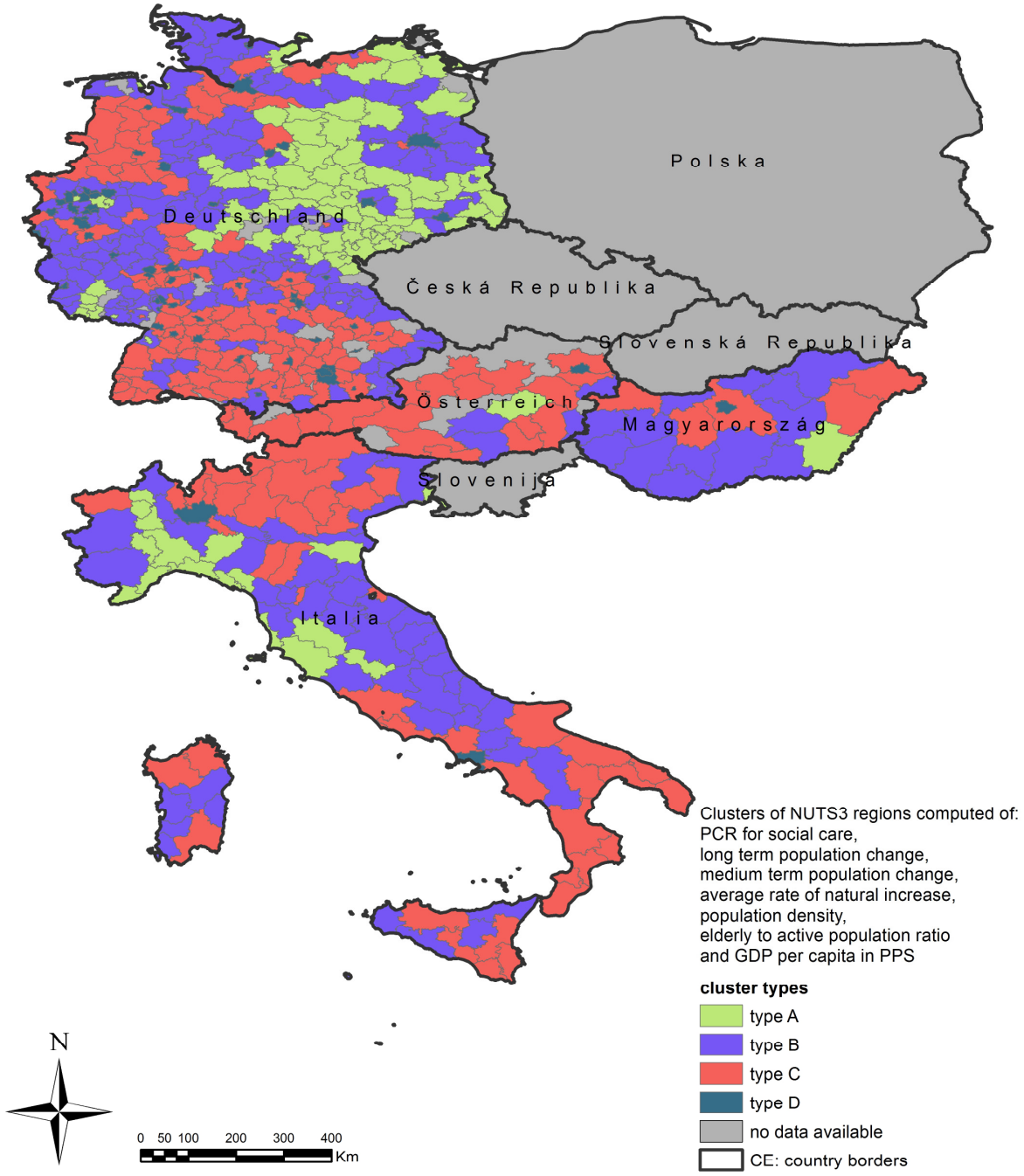
Clusters of similar regions in Central Europe according to public housing proxy cost and other variables



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Taking into account clusters regions according to housing services variables, we can observed some spatial regularities. In Poland clusters of type C dominate, accept some large urban areas. Eastern part of Germany mainly represents clusters of type B, however Berlin and surrounding regions are different type. Western part of Germany are pretty diverse.

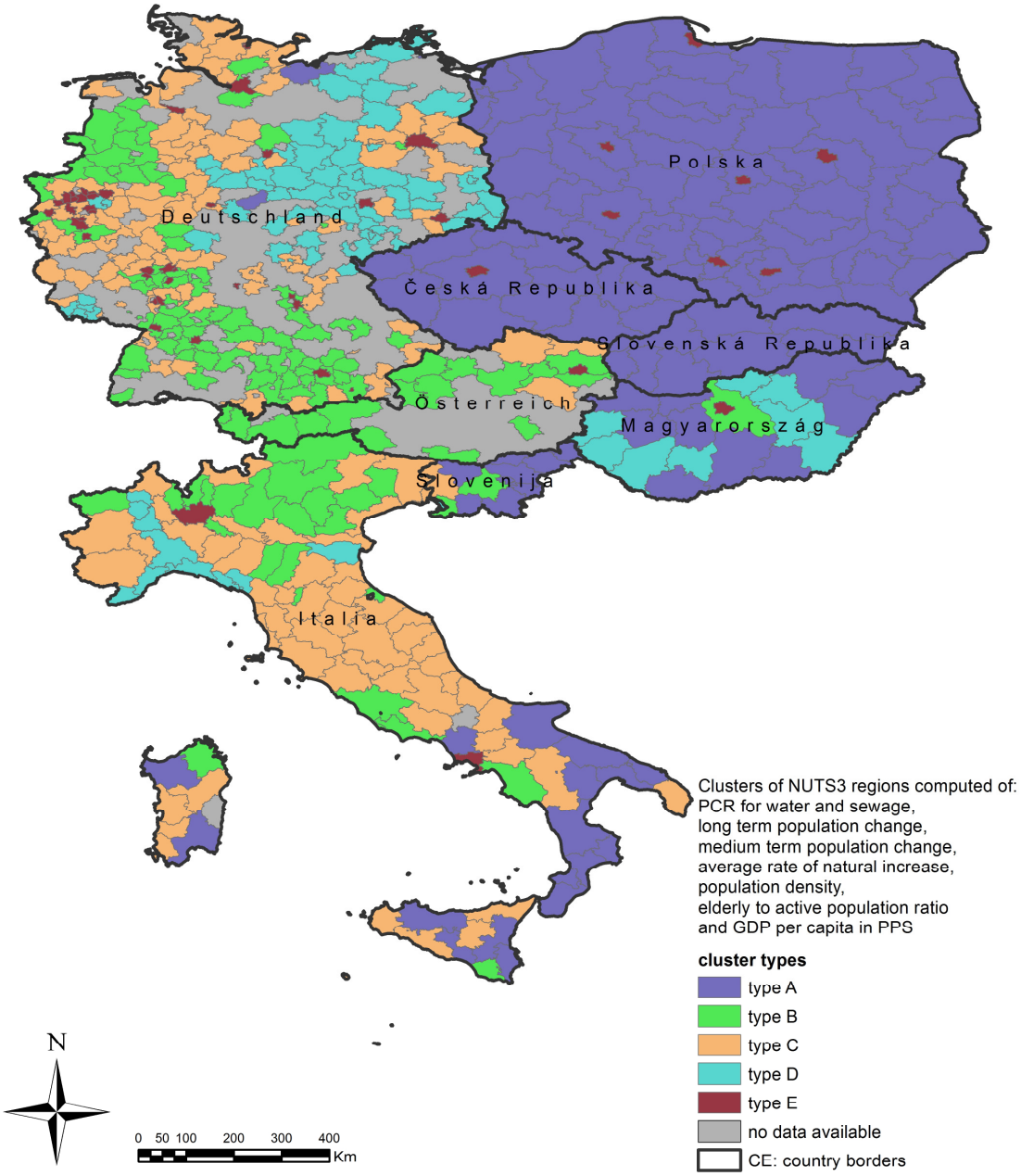
Clusters of similar regions in Central Europe according to social care proxy cost and other variables



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In case of social services we can observe large difference of clusters types in each Central European countries. Type C dominates in north part of Italy, South German NUTS3 regions and Western parts of Austria, while central Italy and South Hungary are regions of type B.

Clusters of similar regions in Central Europe according to water and sewage proxy cost and other variables

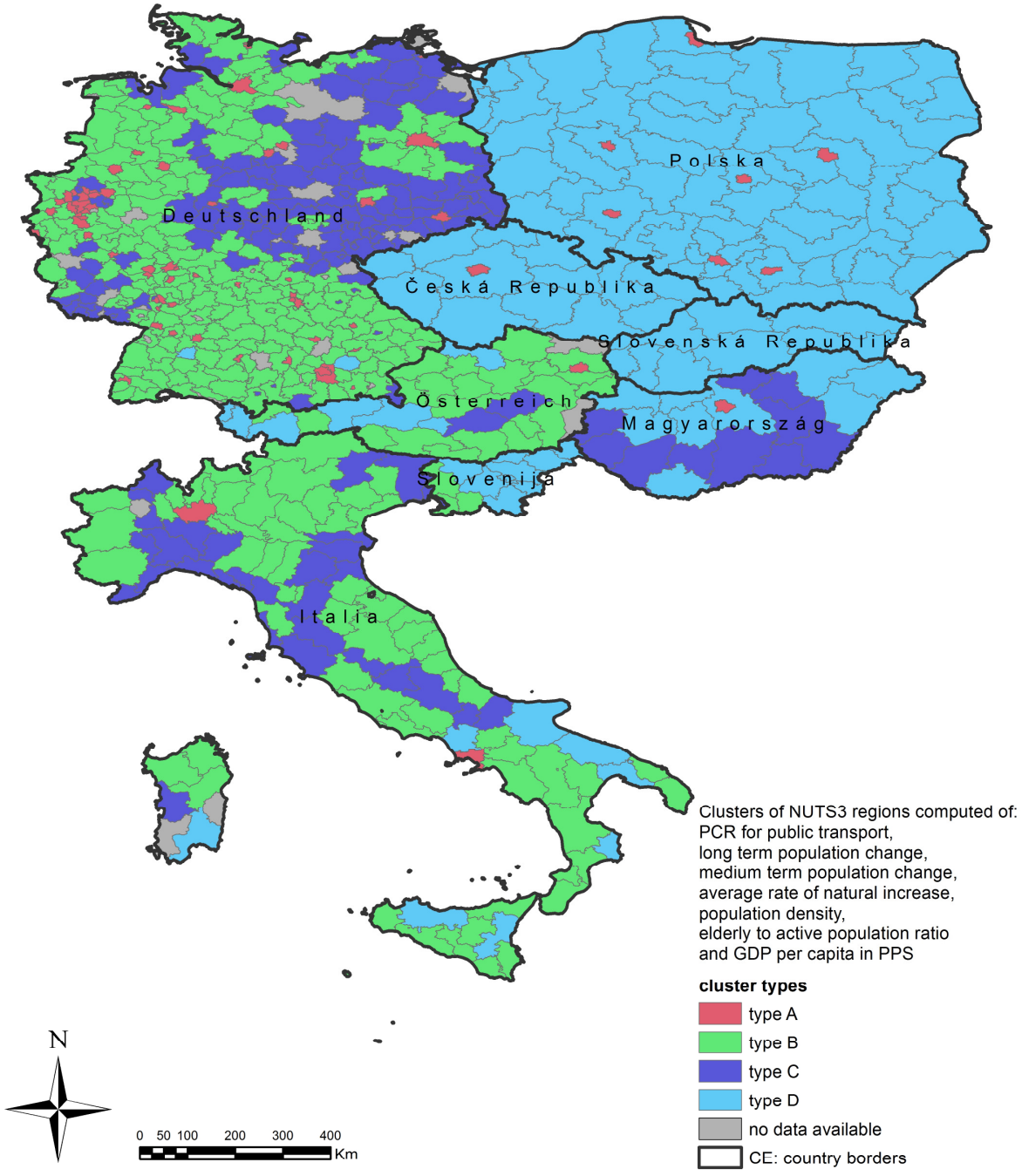


Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In case of water services, regions in Poland, Czech Republic and Slovakia are the same type A, accept large urban areas with type E. The rest of Central European countries are very diverse, however we can observe some “islands” of similar clusters types. For example in

Hungary, eastern Germany or Italy, where different types dominate in North-West (type E), central (type C) and South (type A).

Clusters of similar regions in Central Europe according to public transport proxy cost and other variables



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In case of transport services we can observe some groups of clusters types. Poland, Czech Republic and Slovakia regions are type D, accept large urban areas, which represent clusters of type A. We can also observe some differences in Germany, Slovenia and Austria, where division line runes East-West.

8. In-depth case studies has been described based on common methodology delivered for the investigation. Thematic fields were thought out to describe micro-cases and depict differences in economic indicators. Moreover, they were programmed as a source of panoramic view concerning specific national and local contexts of service organisation and delivery as well as the influences of political, social, technological and spatial determinants on local public services in Central European territories. Social care services show similar pattern in the studied cases. In general, the average cost per beneficiary rises. Social care services seem to be the most vulnerable to demographic changes. Sudden changes to social structures directly rise expectations towards service delivery (more crèche, shelters, subsidies paid, etc.) In other words, the increase in demand directly calls for an increase in supply. In many other types of services demographic change generates a need for efficiency and cuts in spending. For social care services, the situation is to the opposite, more spending may be needed based on the needs of an aging population or increased demand for social care for children. At the same time, it may be worth to notice that social care infrastructure usually does not generate high fixed costs in the system. The demographic elasticity of supply in health care services and infrastructure is higher as compared to any network infrastructure-based services. It is relatively easy to cumulate the service in one place and therefore the fixed cost can be shared between many users. Also, adapting the supply of certain health care services to the number of customers can be easily done in most of the cases. The other general issue observed is the common pressure to control the excessive state expenditure on health care. That is, basically, related to economic situation and not linked to demography. In that case, service quality and service supply are mainly impacted by the state policy. That should not be seen as pro-effective activities but cuts in spending. When it comes to public housing, territories with a significant (dominating) share of public stock of the housing infrastructure are much more vulnerable to the economic consequences of depopulation processes. For privately owned property, market rules apply and decisions as well as consequences impact the owner (individual) and are much more dispersed among the community. The more the housing relies upon the public sector and its ownership, the more the demographic changes affect economic stability of local authorities. On the other hand, “cumulated” ownership allows easier facility

management including relocation of tenets, deactivation of blocks of flats and other adaptation processes. The public housing sector may use mechanisms of selective privatisation (single flat, single house) that is not possible in case of network infrastructure (e.g. with a part of road or water pipeline). Finally, the loss of revenue due to increased vacancy rate may be partly compensated on revenues based on selling dwellings to the market as an alternative to transferring the growing costs onto the remaining tenants. The costs of public transport in the analysed cases are either balanced according to inflation or slightly going up. The return on public transportation ratios is not favourable either. Anyway, this may be regarded as common in territories characterized by weakening demand for the service where there is high fixed costs. The share of subsidies goes up over the years and compensates the losses to the public service. As in analysed cases the population change is believed to influence future situation of the service and its infrastructure, there is a question whether it may impact only the demand for the service or it will severely change the economy of operations. In other words, the subsidies delivered to the system are key to its functioning. As long as the subsidies are provided, there may be limited interest in adaptation either via pro-effective solutions or decreasing the scope of the service. It is mainly linked to the common fact that every change that would strongly impact efficiency needs investments first. There is a natural disproportion of demand and supply in road infrastructure due to the fact that historically established roads can hardly be deactivated. Moreover, any settlement needs road infrastructure regardless depopulation and growth dynamics. While any significant increase in population may impact new road investments, the depopulation trend will rather not lead to road abandonment. For this reason, the main concern of any authority will probably be turned to the costs of maintenance. Investments and spending on new infrastructure would only be linked to development processes focused on boosting territorial attractiveness of precisely defined areas. For example it may include industrial zones or places challenged with potential depopulation. In general, as water provision is the basic public good, its demographic elasticity of supply is rather small. In other words, the demand must be fulfilled anyway, the only issue is whether the final beneficiary is able to cover the costs. So, the question is whether the (usually) increasing costs of water delivery/sewage treatment are transferred onto the final user (citizen, company) or they are subsidised by public authority of any level. The fixed costs of the system mainly determine the economics of water provision/sewage treatment services and infrastructure. Maintenance costs and investments cannot be stopped over the depopulation processes as technical operation of the

system needs to be kept. It is hardly possible that a complete district/significant part of the city is closed down.

9. The presented study offers picture of local public service delivery systems and their complex environments in a perspective of Central Europe. It reveals that the costs of public services are related to demographic change but also they are influenced by other factors. For policy recommendations, the prospective approach is highly needed. Therefore, scenarios over future trends and key drivers of changes should be formulated. Otherwise, the identified relations as well as case-based evidence may mislead if directly used for public strategies or governance models over Central Europe. It is not the aim of the publication to offer such scenarios, policies or strategies as they have been further provided under APDAT2DC works. The initial theses on what may affect social and network services and their infrastructures have been identified within the study (chapter 3.5).

10. The major issue that affects present and future studies of this type is the insufficient coverage of data. If the European Union really pushes towards serious evidence-based policies concerning economic adaptation of local public services to demographic change, new data-sets must be elaborated and included onto the agenda of Eurostat. For the moment, comparability is not possible as the data that would eventually be relevant are either not gathered or presented at state levels. In terms of national statistics, data from countries are hardly comparable and can't be used for sound reasoning. The identified bottlenecks of cost analysis under the shortage of cross-comparable data has been identified and described in chapter 1.6.

11. The ADAPT2DC approach of delivering proxy cost ratios (PCRs) has been an answer to the data shortage in public statistics. A similar attempt has already been introduced by the OECD for microanalyses across countries. Anyway, within the study, the PCR could only be calculated as a static picture covering average values of the last five years. This was due to limitations in business intelligence data available for Central Europe. Therefore, this method should be further developed to achieve a dynamic model. The scrutiny like this could be repeated every two or three years. This is a challenge for research groups or partnerships between researchers and Eurostat set up within the framework of Horizon 2020 or ESPON. The lessons of the study and the proposed research method are believed as a meaningful attempt that can be further developed and utilized by Eurostat. Also, the studies over services

of general interest (ESPON SeGI[3]) could be therefore extended by cost-based analyses. Finally, in further years, the joint effort could enter the yearly statistical agenda supporting EU policies.

[3] For ESPON SeGI project results see for example: SeGI Indicators and perspectives for services of general interest in territorial cohesion and development, ESPON & Royal Institute of Technology, 2012 (www.espon.eu)

1. Studies in public service sector adaptation to changes

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Public sector pays particular attention to the mission rewarded by the state and the actions severed towards its beneficiaries, mainly being the citizens. Thus, it is the people their localities; whatever their size and administrative names are; that lie at the heart of public sector operations. The idea remains unchanged for government and self-government bodies along with co-operating entities. Public sector deals with public goods and intervenes on condition the needs of general interest are unmet[4]. The cost of the service is very often calculated on a non-market basis. Even though, the economists and managers, pay attention to the way the service is financed and run, it may be very often that the policy-makers see to the delivery of add-value to citizens more than the spending itself. And to make things more complex, these days the size of the public service market, its global context and transformation processes have become more influential. Thus, demographic change is questioned as for its meaningfulness to influence the economy and strategic management of service provision. Basically, there are many demographic aspects worth considering. Nevertheless, a potential change of demand for service and supply shifts due to the changes in demographic structure and territorial composition over Central Europe are studied here. So, we formulate a hypothesis that demographic change is significant to the costs of public service. The investigation addresses a broader spectrum, as we believe that various contextual process influence as well, the running and managing of public services. In other words, the demography cannot be seen as a single variable that scales the economy of the public service linearly.

Chapter one offers general theoretical issues behind the economic rules of operations, i.e. the economy and management of public sector. This leads to a formulation of assumptions for studies implemented across Central Europe in order to capture cost-related factors shaping

[4] Or a regulation of market-based actions is for some reason needed. This may include monopolies or specific aims targeted by the state (i.e. energy security).

delivery of key local and regional public services with a special focus on adaptation to demographic change[5].

1.1. The basics of public sector economics

Discussions over local and regional public sector economics start from searching answers to following questions:

- What are the reasons for public intervention in the production and distribution of certain goods and services?
- How do local governments decide how much public goods to provide? (What is the optimum level of local public goods?)
- What is the specificity of different local public goods and services? (Whether operation patterns should seriously vary due to service characteristics?)
- What are the effects of local public services provision, and how to measure the effectiveness of local public goods provision?

There are two fundamental theorems of welfare economics that can help with the dilemma. The first demonstrates that, under certain conditions, there is no better solution than the one generated by competitive markets. It means that any alternative solution that makes someone in the economy better off must also make some else worse off. It is said to be *Pareto optimal*. The second theorem shows that, if certain well-specified conditions are met, the government can shift the economy from one Pareto optimal solution to another by redistributing purchasing power and then allowing people to trade in competitive markets.[6] However, there are some situations in which competition generates unsatisfactory outcomes, which are called market failures. They are often associated with information asymmetries, non-competitive markets, externalities or public goods.

Information asymmetry deals with studying decisions in transactions where one party has more or better information than the other. This creates an imbalance of power in transactions. Imperfect competition is the form of market organization under which good's price is not equal to its marginal costs. The presence of this situation suggests that something has prevented sustained competition among firms. Usually it relates to seller or buyer entry barriers. First cases are monopoly or oligopoly, where one or few firms can dictate terms to its

[5] The issues of demographic change in Central Europe have been studied in parallel in Šimon M., Mikešová R.: A socio-economic background analysis. Demographic Change in Central Europe, ADAPT2DC project, Institute of Sociology of the Academy of Sciences of the Czech Republic, 2013

[6] Leach J.: A Course in Public Economics, Cambridge University Press, Cambridge 2004, p. 4

buyers (for example water supplier), the second cases are monopsony or oligopsony, where single buyer or few buyers can choose from many sellers (for example military industry). Externalities can occur when a person's utility is affected by another person's consumption or by firm's production activities. Externalities only occur when appropriate monetary compensation is not made. If there are external benefits (positive externalities), such as in renovated buildings or well-kept gardens, less of the good may be produced than would be the case if the producer was to receive payment for the external benefits to others. If there are external costs (negative externalities), such as noise or air pollution, the producer may choose to produce more of the product than would be produced if the producer was required to pay all associated environmental costs. Individuals make decisions on the private benefits and costs, not taking into account externalities. Private benefits plus externalities are considered as social benefits, and private costs plus externalities are social costs. Major problems with externalities are the difficulties in measuring and valuing external effects and linking it to producers and consumers. A local public good has two main characteristics. Firstly, it is non-rival in consumption. Secondly, it is non-excludable. Non-rival means that the consumption by one individual doesn't lessen the quality available to others (for any level of production, the cost of providing good to additional individual is zero). Non-exclusion means that it is not possible to prevent people who have not paid for good from having benefits from consumption. Consumers can free-ride by consuming good without paying for it. The third characteristic of local public good are localized benefits.[7,8] Local public goods provide benefits to individuals who are relatively close to the place where good is provided and naturally excludes from consumption individual who are distant.[9] Customers shall bear costs depending on their locations. The cost of local public goods can be one-off payment – for example buying a house near public park – or can occur every time when you take decision on consumption – for example reaching public park by car or public transport.[10] The task of correcting market failures generally falls to the government. The government regulates behaviours of the private sector, for instance using environmental policy or competition policy. The government also involves itself in production and distribution of goods and services, for instance congestible public goods.

[7] O'Sullivan A.: Urban Economics, McGraw-Hill Higher Education, International Edition 2000. p. 458
[8] Polko A.: Urban Public Space – from Economics to Management [in:] Urban Public Spaces – Economics and Management Perspectives, Eds. K. Heffner, A. Polko, Studia Regionalia, Vol. 34, Warsaw 2012, p. 9-21
[9] Choumert J., Salanie J.: Provison of Urban Green Spaces: Some Insights from Economics, Landscape Research, Vol. 33, No. 3, 2008, p. 334
[10] Polko A. (2012)

These observations imply focus on basic issues concerning public choice. Decisions on spending on private goods are taken trough price mechanism, while spending on public goods is determined by political decisions. In the latter we are dealing with collective allocation of resources, which generates two main problems. First problem is identification of preferences regarding the quantity of public goods. Second problem is aggregation of preferences.[11] Democratic system offers a set of voting rules that are used in decision-making process. If the spending level for public good is determined by majority voting, the winning budget is the preferred budget of median voter.[12] If the voting outcome depends only on the median voter's preferences, it can be inefficient because the costs of public goods are divided equally among voters. Alternative approach offered by Erik Lindahl is based on the benefit principle. It means that tax liabilities are based on the benefits received from public goods by citizens. In other words, Lindahl equilibrium happens when the amount of produced and consumed public good is adjusted to the price that individuals are able to pay for the good. The Lindahl equilibrium is Pareto efficient.[13] Anyway, there are some problems with Lindahl approach. Firstly, local governments don't know the shape of marginal-benefits curves of individual citizens, so it is hard to estimate the appropriate tax for them. Secondly, citizens may hide their true preferences to get a free ride. They understate their willingness to pay for local public goods.[14] Finally the Tiebout model can be applied. It assumes that people vote with feet, choosing local government that provides the best combination of taxes and local public goods. This household´s mobility and sorting according to their demands for local public goods may increase efficiency of local governments. There are some critiques of Tiebout model assumptions.[15] Firstly, cost of moving is significant and some households tolerate dissatisfaction of the level and quality of local public goods. Secondly, there are not enough local governments to provide households with the ideal level of public goods, so citizens have to compromise choosing the location with best combination of local public goods, taxes and housing costs. Thirdly, there are externalities associated with local public goods.

All those models and notions can be used to depict processes running in public service sector. Going into possible examples, one may ask of arguments for public provision of water and the sewer system. The first answer is externalities. Namely, the higher the quality of water, the lower the probability of water-related disease. The other answer may relate to water

[11] Stiglitz J.: Ekonomia sektora publicznego, Wydawnictwo Naukowe PWN, Warszawa 2004, p. 191
[12] O'Sullivan A. (2000), p. 483
[13] Stiglitz J. (2004), p. 206
[14] O'Sullivan A. (2000), p. 484
[15] O'Sullivan A. (2000), p. 494

distribution, which is a natural monopoly with a serious lock-in problem.[16] Entry to water and seweage sector needs a huge investment in infrastructure and returns are greater because of economies of scale. These facts caused that new firms would be unwilling to start water pipeline business, thus one and big firm become naturally dominant. This firm has greater bargaining power than customers, who have to pay whatever that distributor charges. Usually, lock-in means difficulties of customers to switch to a different water distributor. But lock-in works both ways.[17] Once private company has made a huge investment in pipes, it cannot relocate them. It has no alternative use in case of reducing demand (for instance because of depopulation).

Another specific can be shown in case of housing. There the most important sources of market failure arise from externalities of three types: direct, interactive and intergenerational.[18] Direct externalities relate to health problems caused by poor living conditions. Interactive externalities (both positive and negative effects) occur wherever the use or upkeep of particular property impacts in the value of another. Intergenerational externalities arise because the social discount rate is lower than the private rate (individual decisions are short-term comparing with society longer-term solutions. Because of immobility, housing environment have public good characteristics and in consequence faces problems of suboptimal provision.[19] If only a few owners undertake the investment, their property value will not increase sufficiently to compensate them if the area as a whole remains undesirable. Owners who invest in property improvement gain less return because many neighbors who do nothing are *free-riders* and enjoy the benefits of an improved environment. In this case property owners have no motivation to undertake repairs, even though all may want it. Solution of this dilemma is based on public intervention such as improvement grants offered for owners located on areas of decline. Alternatively, local government can undertake selective compulsory purchase followed by renovation and eventual sale.[20] There is another reason of public intervention in housing market. Housing is seen as a merit good.[21,22] Merit goods are products or services, that from perspective of society should be consumed by all people regardless of whether they like it or not. Good examples of merit goods are education or vaccination. Lack of housing (homelessness) or

[16] O'Flaherty B., City economics, Harvard University Press, Cambridge, Massachusetts 2005, p. 212
[17] O'Flaherty B. (2005), p. 213
[18] Whitehead C.: The Economics of Social Housing, [in:] Housing Economics & Public Policy, Edited by T. O'Sullivan, K. Gibb, Blackwell Science, Oxford 2003, p. 139
[19] Balchin P., Isaac D., Chen J.: Urban Economics – A Global Perspective, Palgrave, Hampshire 2000. p. 428
[20] Balchin P., ... (2000), p. 428
[21] Whitehead C. (2003), p. 141
[22] Polko A.: Publiczny charakter nieruchomości, Nieruchomość, Nr 2/58, 2006, p. 10-14

insufficient level of housing service consumption (poor standard of living) generate negative externalities, thus public intervention is focused on providing minimum standard of housing services.

Transport services can be used to present another approach. Commuters choose the mode that minimizes the sum of monetary costs (fares) and time costs. Mass transit has a lower monetary costs than autos but higher collection and distribution time costs.[23] There are trade-offs associated with bus service: decrease in the headway or an increase in the frequency of stops decreases collection and distribution costs, but increases line-haul costs. Highly subsidized or even free public transport would be possible if the savings in travelling, congestion and administrative costs exceeded the extra rate of public spending (public costs).

In all (or almost all cases) public bodies struggling with service delivery organization choose out of two policy options. The first one is supply-side, which means in general that the level of good available and accessible is set in a way to balance community needs and regional / local governments' spending possibilities. The second - demand-side - refers to targeting customer (citizen) with dedicated instruments (vouchers, subsidies, fees etc.) that will increase or decrease customer's willingness or accessibility towards the service.

1.2. Public sector and the rationale for its transformation

Dilemmas in public sector economics emerge quite often as crucial issues when ideas get into praxis of public service management. And for this particular reason both approaches, rooted in economics and management, need to be considered while working on public service adaptation to changes of various nature.

The idea behind management, *sensu largo,* has been well structured in literature and dates back to the early works of classics from XIX and XX century; Fayol, Taylor, Adamiecki and others. Waters[24] says that those who produce goods or provide services need to know how to operate the process of making products. This is, thus, the way we see operations management. One of the definitions that provokes interesting questions for any organization, whether it serves for the public or it competes for markets, is the one by Clarke who states that management is *tuning to the environment*[25]. The verb "tune" is brilliant to understand that we speak about pursuit of changes. And of course, we do our best to understand the environment.

[23] O'Sullivan A. (2000), p. 609
[24] Waters D.: Operations management. Producing Goods and Services, Pearson Education Limited, Harlow, 2002, p. 2-27
[25] Clarke L.: The Essence of Change, Prentice Hall International, 1994, p. 1-31

This is far more than a simple requirement for smooth daily-based operations as this is a challenge for strategic change. Here we enter the world of strategic management introduced by Drucker[26], Ansoff[27] and others in 70s. and 80s. of XX century. What makes the difference between the operation and strategic management is the time-span and attitude to decisions. Drucker explains the merits of strategic management by offering a broad spectrum of issues among which long perspective is critical. He says:

> *"…practically every basic management decision is a long-range decision - ten years is a rather short time span these days. Whether concerned with research or with building a new plant, designing a new marketing organization or a new product, every major management decision takes years before it is really effective. And it has to be productive for years thereafter to pay off the investment of men and money. Managers, therefore, need to be skilled in making decisions with long futurity on a systematic basis. Management has no choice but to anticipate the future, to attempt to mold it, and to balance short-range and long-range goals. It is not given to mortals to do well any of these things. But lacking divine guidance, management must make sure that these difficult responsibilities are not overlooked or neglected but taken care of as well as is humanly possible…"*[28].

These days, many authors see the time-perspective rather differently, confirming that even a couple of years is too long for any business decision. This is due to the dynamics of changes, increase of data availability and globalization process. So, all in all, planning for a long time can be misleading and thus management calls for new techniques and tools such as e.g. foresights. However, for Minzberg who pays attention to the dynamics of management, managing has always been action in a turbulence-rich environment. Managers do their best to communicate under time pressure that has increased due to the rise of information exchanged every day. So information revolution, made possible due to the rise of Internet, makes the difference but for managers it is the tools that has changed and not necessarily the time perspective[29]. Nevertheless, planning for actions and setting goals with a perspective of several years ahead needs careful attention at the organization level. These days global communication and flow of information has changed dramatically allowing the clients and competitors to know more and much earlier than it used to be. So, the decisions taken as

[26] Drucker P.: Management. Tasks, Responsibilities, Practices, Truman Talley Books, E.P. Duton, New York, 1986
[27] Ansoff H.: Strategic Management, Macmillan Press, 1979
[28] Drucker P. (1986), p. 89
[29] Minzberg H.: Managing, Berrett-Koehler Publishers, 2009, p. 17-40

managerial ones need more attention targeting strategic changes in the environment and even more visionary actions to create new value to the customer / client. Now, the question that may be particularly important for the public sector organizations is whether the management has changed the same way as for the business world. One should know that the traditional perception of public administration draws back to M. Weber, W. Willson and others who set up the pillars of organizing the production of services to citizens. The bureaucracy, as we call it, has been one of the key structures for public administration. The Weberian model outlines a perfect administrative organization. Its managers are professionals well equipped with knowledge and follow the tasks that encompass only the public interest. In that sense, the unequal decisions were not to be taken. Bureaucracy, with all the regulations and documentation is sometimes seen more as a pejorative process. This is, however not true and should not be confused with another process - making the life enormously bureaucratized. Anyway, what makes the model interesting, regarding the evolution of management in public sector is the distinction between (separation of) the policy and the administration. In other words, the traditional administrative model of public sector operations is characterized by non-political administration, hierarchy and regime of operations, stable structures, institutionalized civil service and internal regulatory environment. The question, one may put forward, is why has the administrative model of public sector service needed to have changed over time?

There have been several key factors that imposed the new “space” for changes in the approach to public service management. Apart from the changes of economic systems and their rationale, global influences changed the meaning of a word local. When it comes to the economy, the ideologies behind the political and economic systems around the world changed in the last decades. With more neoliberal; and these days even more communitarian; doctrine, the administration serving the public no longer performs operations by itself. Reforms by Thatcher and the optimism given to contracting in the 80’s of XX century in the UK are presumably most recognized examples of the shift. But, the doctrines, are not the reason by themselves, to see new public sector in action. It is the cost of public service to the society and to the tax-payers. Namely, the incredible growth of public spending we could see in the 70’s and 80’s of XX century, seems to be one of the reasons to question the amount of resources used by the public sector and to expect even higher performance and service quality. Over the 20 years, in some of the OECD countries, the employment in government

has at least doubled (i.e. in Austria, Belgium, Portugal, Spain).[30] Not only the questions of uneconomical spending or the optimal structure of public sector employment were put forward in the 80's but also the doubts in the debate include the performance, the structure of spending and control over the democratic decisions. On top of that, the new democracies of 90. of the XX. century have been formed in Central and Eastern Europe and took their time to mature the meaning of public service. In the post-socialist countries the transformation period has strengthened pressures for more democratic order. With the most difficult period of the transition behind, Central European countries such as Poland, Czech Republic, Slovakia, Hungary have entered into a stage of even more mature democratic order. Thus, the adoption and implementation of new laws and new democratic values in the best interest of everyone, have led to the revision of a how public sector is seen. Stanilov[31] writes that "the decentralization of power to local governments, further tightening of development regulations, increasing investments in public services and infrastructure, and securing funding for regional and municipal planning activities" is by far advancing with various speeds throughout the Europe. Nevertheless, be it Prague, Budapest, Warsaw or other cities across Central Europe (or even Eastern Europe as pinpointed by Tsenkova[32]), the civic involvement into the process of strategic planning has been deeply reinforced over the last years. More and more voices of local taxpayers are considered for how is service run and managed in longer perspective.

The second reason that is said to have changed the public sector is conditioned by even more global factors. The economic and political crisis of the 70's in XX century was followed by countries recessions. A global stagflation was most probably caused by increased welfare spending and high inflation. The unemployment and prices that went up at that time called for more actions by the states and led to pressures of employees organizations. The global political and economic crisis and the pursuit for upturn in the situation brings us to the third change factor: a crisis in public administration. New research over the traditional approach in public services organization together with an increased interest in the business management tools and techniques provoked reforms of public sector administration. The key themes for public sector modernization are following (tab. 1).

[30] Naschold F., von Otter C.: Public Sector Transformation Rethinking Markets And Hierarchies In Government, John Benjamins Publishing Company Amsterdam/Philadelphia, 1996, p. 4-11

[31] Stanilov K.: Urban development policies in Central and Eastern Europe during the transition period and their impact on urban form [in:] Stanilov K.: The Post-Socialist City Urban Form and Space Transformations in Central and Eastern Europe after Socialism, Springer, Dodrecht, 2007, p. 347 -460

[32] Tsenkova S.: Urban futures: Strategic planning in post-socialist Europe [in:] Stanilov K.: The Post-Socialist City Urban Form and Space Transformations in Central and Eastern Europe after Socialism, Springer, Dodrecht, 2007, p. 447 -471

Tab. 1. Key themes for public sector modernization

KEY THEME OF MODERNISATION	UNDERSTANDING
Separation of the client role from that of provider / contractor	Separation of the programming and specification of services from their production and provision is considered a necessary condition for market development, and at the same time is supposed to overcome the overlapping of interests between client and provider roles which occur in many administrative bodies.
Development of contractual arrangements	The public sector is traditionally characterized by direct, hierarchical control of its activities. The administrative modernization program aims to establish client-supplier relations within the organization by means of internal contracts.
Accountability for results	Internal contracts, devolution of management responsibilities and the creation of agencies with framework agreements all presuppose that each administrative unit is accountable for the results of its activities; this, in turn, presupposes performance evaluation. The introduction of performance indicators and measuring techniques, of external audit commissions and performance comparisons (e.g. by means of success tables) becomes an integral part of administrative modernization
Flexibilization of pay and working conditions	National, highly detailed agreements are the normal means of determining pay and working conditions within the public sector. However, the greater the independence of each administrative unit, and the greater their accountability for their own performance, the stronger the trend towards decentralization and towards the flexibilization of pay and working conditions.
Separation of the political process from the managerial process	This constitutes a further characteristic of modernization within local authorities, the NHS, and in central government. Traditionally, political control is exercised by hierarchies under the responsibility of ministers and committees. The aim is now to split these control structures into two elements: strategic control by political representatives; operative control by a relatively autonomous top management.
Introduction of real or quasi markets	The replacement of the public administration, a single, monolithic supplier, by a large number of (potential) suppliers is intended to bring about real or quasi competition. It is to this end that compulsory competitive tendering (in local authority administrations) and the opportunity of opting out of the public education and health service were introduced.
The public as customer	The increasing emphasis on the individual rights and choices of customer, with little reference to the rights and duties of citizens constitutes a further characteristic of the modernization strategies. The task of the state is seen as guaranteeing rights, and much less as responsibility for providing services
Regulation and own production	A significant trend is the decline in the importance of the public sector as a direct provider of services, and a parallel increase in the emphasis on the regulation of the process of service provision. The creation of regulatory agencies in privatized industries, the setting up of external audit commissions and independent inspectorates in many areas of public services all provide examples of the increase in government regulation in relation to own production.

Source: adapted from Naschold F., von Otter C.: Public Sector Transformation Rethinking Markets And Hierarchies In Government, John Benjamins Publishing Company Amsterdam/Philadelphia, 1996, p. 41-42

As we can see for the public sector this is even more than a reform. It is a change in a culture that acknowledges business and market-driven administrative culture. For practitioners and academics, these paths of changes and reforms in the public sector seem particularly interesting and offer a wide portfolio of in-depth future knowledge. Again, the practitioners and experts gain new potential areas of change implementation and the academics new fields of research to upgrade the theoretical knowledge on public sector development. For example, as we can read from Sager,

> *"… the claim that water is best supplied by the same mechanisms as ordinary economic goods has been used to justify a shift from treating water as a public service to treating it as a good for which users should pay according to the volume consumed. Neo-liberal policies include privatisation, market-simulating decision-making techniques (Bakker, 2002), full cost recovery, reduced state subsidies, avoiding cross-subsidies (Haughton, 2001:67), and tariff structure based on marginal cost pricing. When the network is extended only as long as the marginal revenue from the additional connections exceeds the marginal cost, then significant segments of poor potential customers will remain unconnected.* ***Experience shows that many private water companies have problems balancing stable returns and efficiency against the equity and social profile expected by politicians*** *(Bakker, 2003b).*[33]

Those issues illustrate that public service economy should not be just a subject to quantitative evaluation. It has to be, what needs to be stressed, a mater of qualitative investigation as well, with particular interest into specifics of how the service is managed in short, medium and long term perspectives. For the studies over cost of service and infrastructure, the areas, called in below, even though subjectively provided by authors, confirm an understanding that by no means should, the economy of service provision and the management be separated from its contextuality in the analytical effort (tab. 2). This is not yet a full picture of what makes the public sector complex. Rather that, we take the chance to illustrate the variety of new and interdisciplinary fields that may add up to the understanding of processes and management practices in the public sector on top of the cost-based studies. What may be interesting, in terms of future models, is paradoxically the risk of unknown, on one hand, and at the same time a variety of new opportunities that arise for the performance of public sector in changing demand.

[33] Sager T.: Neo-liberal urban planning policies: A literature survey 1990–2010. Progress in Planning, 2011, p. 168 (bold part highlighted by authors)

Tab 2. Key fields of change in the public sector and their context

CONTEXT	KEY AREA
spatial	- co-operation and participatory actions in planning processes offered by business and civic organisations
organisation and management	- leadership and leaders of success entrepreneurship and competition enabled in governing processes, - multi-sectoral alliances and strategic alliances, - new public services (public service innovation)
economics	- social and economic efficiency of public sectors, - the size of public sector and its spending, - externalities and public goods
institutional	- public sector as a catalyst of changes in the territory, - social networking and business clustering, - glocalisation, - influence of international organisations
policy and politics	- governance vs. government, - local service strategies, - public sector values, - sustainability
social	- participatory actions, - social capital, - enabling the citizen, - democracy and transparency
administrative and legal	- public sector reforms, - tendering procedures, - civil service, - regimes, - good governance

Source: own representation

The picture of changes that public sector faces nowadays is a complex one. For those dealing with administrative procedures, a shift towards more participatory tools in spatial investments' decisions is a vital change. Internet and GIS software has never been so open to the public and easy accessible for knowledge sharing. This is also linked to civic networking and new forms of decision-making support in the process of public space development. The process of strategic management is supported by a plethora of actors who try to find their stakes as close to public values shared by the community as possible. In other words, governance takes after governing and reflects on new ideas and potential increase in transparency of decision-making. The performance, so much favored by managers, becomes a shared responsibility and a task of policy-makers whose goals are precisely set on the parameters reported in balanced score cards or other types of performance management routines. This is a new time of public management and this a challenge to learn how to be quicker than environment.

The recent changes in local public sector are seen as a key element that influences the economics of public sector, its spending and further transformation paths. In other words, for studies on public services and its economics, a picture of how:

- the legislative setting at various levels of political responsibility,
- micro and macroeconomic trends underpinning the monopolies and markets,
- demographic change patterns,
- the reforms of the service management or new philosophies of governance and
- other organizational changes

translate the shifts in up-to-date and future costs of the service held by the sector and its users. Therefore, an investigation of recent and future contexts is absolutely necessary to get to know if the sector economizes its activities in a turbulent time. For more on the analysis see respectively the examples offered in Chapter 3 and the field studies' methodology as provided in Annex.

1.3. The improving public sector

The reforms of public sector introduced several types of change to the service, financing and decision-making processes. Basically, market biased reforms provided more space for competition in local delivery of public goods and service to citizens. A choice of deliverers and operators to be contracted under the terms agreed by public sector to secure the required standards has become one of the key trends in this new philosophy. This applies both to national (state) as well as regional / local levels. The managerial reforms, targeting administrative capacity to build upon knowledge, opened a new chapter in the history of professionalism involving business solutions and techniques widely applied around the corporate world. Standardization of procedures, new IT solutions used for smooth internal communication and process operations in the administrative field should improve the transparency of decisions but also, and even more importantly, move the professionalism of administration staff to a higher level. Managers are expected to be responsible for operations and running in terms of processes and projects instead of simple tasks and routines. The changes, called systemic or programme-based, should be seen even more convincing, as they basically relate to the improvement of public sector's ability to analyse and diagnose the efficiency of public service. In other words, the reforms applied to public systems call for techniques and instruments to be incorporated in the public policy implementation. This is for

instance the general idea of benchmarking and performance based management. Finally, the devolution and deregulation have become buzz words of the public sector reforms. For both cases, the state is no longer the operator of some services and the role for local and regional administration is much stronger in terms of delivery and choice of operator. Even for financing, the shift – possibly not immediately and just for some service fields – can be seen, especially with regards to those government systems that are open for local structures and the shift of political power.[34] For example, in majority of communities in Italy and Germany, management of public services is made by the use private-law form of firms (e.g. joint stock companies). Nevertheless, the local governments are still the main owners.[35]

The variety of control delivered to sub-national public systems over Europe makes the picture of public sector even more complex and vivid. Thus, we may assume that it should be even more challenging to describe the public sector management. Hill and Lynn try to deal with the definition by means of describing public manager. In that respect, they claim that public managers are formed by rules and laws and become creatures of their environments. Nevertheless, at the same time they are the creators of the roles for themselves as well as organizational capacity and certain priority. Also, for them public managers may be involved in networks or micro-networks that work within and across organizational boundaries. This lightens the process of responsibility over the allocation of resources and achievement of (policy) goals rather than the technical service delivery[36]. And here comes the core of public management logic. In that sense the public manager becomes much more open for policymaking and politics as well as leadership.

There are three substantial dimensions of public service improvement. First, the structure – with all the authorized delegation of responsibilities that allow taking care of actions to fulfill policy objectives. This implies budgets, orders, laws as well as the processes of decision making, communication and creating administrative structures. On top of that, we may look for practical examples of several offices set up towards working together in order to cut on costs and coordinate activities, i.e. Secondly, the culture – with all the institutional values. For the management literature, institutionalization means more or less, a process of

[34] For example John [John P.: Local governance in Western Europe, SAGE Publications Ltd., London, 2001, p. 36] described local government systems in Western Europe to indicate the variety of sub-national systems that exist in public sector. The functions allocated to those sub-national systems vary from country to country and basically so does the financing. This imposes the "autonomy" of public service management and may truly override differences in the standards offered locally.

[35] Calabro A.: Governance Structures and Mechanisms in Public Service Organizations. Theories, Evidence and Future Directions, Springer-Verlag Berlin Heidelberg, 2011, p. 40-45

[36] Hill C.J., Lynn L.E. Jr.: Public Management. A Three-Dimensional Approach, CQ Press, Washington, 2009, p. 8-10

unifying of a meanings that go beyond the organizational tasks. For individuals, it means the norms and standards that are over the written regulation in a given organization. It can be the pride of an organization or a reputation of success that positively affect the performance of the staff. A spirit of success in an organization can be the backbone of performance success. Of course, the culture can affect the performance in both positive and negative way. Finally, public management is created by means of craft – a capacity to influence government performance through personal efforts, skills, and expertise of people. In other words, the managers of public service largely influence policy implementation through the decisions they make and actions they perform directly[37].

So, where is the improvement and how does the managerial way takes over the administrative effort for the potentially demography-driven demand changes? There are basically, five theoretical perspectives on service improvement including: resources, regulation, market structure, organization and management. The typology given by Boyne[38] serves well to understand the changes applied to public service performance, among which the management logic plays vital role. Considering resources as a first perspective on service improvement Boyne outlines that the service efficiency will deteriorate with the increase of public budgets. This belief is supported by the views, already mentioned on the crisis that led to the need for cuts in public spending. The extra resources may simply "evaporate" in the administrative structures serving the operations. For regulation, the argument provided is that, on top of general significance of regulation as a positive factor for service performance, there might be even more harmful impacts due to conflicting pressures from several / multiple regulators. In other words, the increasing number of regulatory instruments may be followed by a reduction of returns. Of course, the state or a local agency (policy) as a regulator can in general bring positive effects to regulated field. The issue here is not to allow different expectations and restrictions from various regulatory bodies. The third idea behind the service improvement is that of market structures injecting greater competition into service. With the assumption that competition promotes efficiency, entrepreneurial activities and greater responsibility under the threat of losing the competitive position, the concepts plays key role in the service improvement. However, the critiques of the idea put forward to opposing arguments. Namely, one may be suffering from the loss of equity and secondly, according to the theory of transaction cost, the less the suppliers and the lower the information costs, the

[37] Hill C.J., Lynn L.E. Jr. (2009), p. 46-58
[38] Boyne G.A.: Sources of Public Services Improvement. A Critical Review and Research Agenda, Journal of Public Administration Research and Theory, 13(3), 2003, p. 367-394

better for the provision of the service to be arranged by means of the hierarchy. Regardless the critique, the positive change in the public service is believed to be widely available with the marketisation of public services. The next perspective, seems to have gained special place in the rhetoric of public management reforms. With the common understanding of the upturn, basically seen in the organizational changes. Redesigning of public service provision has a symbolic meaning as it can be perceived as a signal to expect new performance and new outputs, also in terms of policy and political goals. The winning parties often use this rhetoric to pinpoint the necessity of reorganization and to support the positive changes shortly to be available due to the changes. Moreover, the two contrasting ideas of: fragmentation leading to more responsiveness in local and micro scale service and consolidation leading to the effects of scale and benefits of knowledgeable environments; seem to give as many prospects for sound change as they provoke debates of those in the mood to reform the public sector. Also, a change in the internal and external source of organizational powers is interesting here and brings even more contradictory views. The long debate on contracting out and the effects and successes of mobilizing more skills external to the contracting organization are opposed to a experience of a single organization performing temporarily poorly. For the four perspectives, neither pros nor cons can be objectively measured and decisions whether they are promising or not generalized. The fifth perspective is somehow most promising and as the empirical investigation by Boyne suggests it proves most significant as it is for the resources perspective. So what is the management perspective? For public management, the leadership style and expertise plays pivotal role. The argument here is that for any change taking place in the service performance, it is the elites who are responsible for them. Also, the organizational culture provides extra sources of improvement on condition, the results are taken into account instead of procedures. The same goes for human resource and the upgrading of motivation to changes and directly leading to better organizational performance. Finally, public management is a process linked to strategic processes of planning. There is evidence that for private companies strategic planning provides better performance and so is believed for public ones. The concept of strategic processes is followed by strategic content that is basically related to how the public sector sees its role – to lead the service world or to defend its service "space" and consequently how the public sector performs in terms of changing markets, products and procedures on the basis of current and future needs.

Summing up, we may assume that the more changes we describe and the more concepts we identify, the more complex the issue of public sector management becomes. There is, however a reason to give such a detailed description over the perspectives and dimensions of

public service improvement. We believe that being aware of the arguments favoring the changes and getting to know the critique is needed prior to investigating the models of public management that have evolved over the recent years in Central Europe. Cost-based performance analysis of services and infrastructure is therefore a challenge that may neither statistically nor descriptively provide simple answers. Chapters 2 and 3 consequently offer these two perspectives (quantitative and qualitative) and can be seen as a complementary approach towards the cross-country study of costs against the performance of service provision under different legislative, technological, demographic and economic conditions.

1.4. The evolving contexts and models of public service management

The evolution of modernized governments in the sub-national scales can be described as a consequence of changes in the logic of service provision and reforms of public sector management.

The first typology is built purely around the service provision logic of local / regional governments. There are three models of arranging the services: the self-supportive model, the model of market-driven service provision and a mixed model[39]. The self-supportive model has been probably the most common in the past when the "production" of community service was assumed a single task of public governments. That, as a consequence, allows the governments to favor the public sector who becomes the only operator of the service. Also, that means, the policy-makers can manage the operating bodies and enlarge their productive potential and technical base. The complete control over the process of financing, producing and delivering of the services belongs to the government and its public sector bodies. The bureaucratic structures needed for the administration of the process are pretty big to secure the operation. This logic makes the choice of service basically attached to the government and its public territorial agencies. Nevertheless, the security of service delivery is guaranteed by the state. The second model – a market one, describes the government as a guard of strategic and regulative character instead of all-in-one solution. That means, government and public sector are open for competition in service "production" and delivery while the control on the offer and paying for it remains its key competence. It is not excluded from being the operational partner and provider of service. Market mechanisms are supported by the government. It means that competition becomes a fact, and introduction of new businesses to the market or

[39] For more on the models see: Wojciechowski E.: Zarządzanie w samorządzie terytorialnym, Difin, Warszawa, 2003; Kuźnik F., Polityka rozwoju i zarządzanie usługami publicznymi w strukturach samorządowych, Polska Akademia Nauk Komitet Przestrzennego Zagospodarowania Kraju, Warszawa 2012, Studia, Tom CXLIII

new products allow a better external (market driven) control over the supply. The demand is verified by and with the users of the services. A mixed model takes the form of coexisting solutions from either traditional self-governing model or the market one. Seen in this perspective, it offers combinations of market and administrative types of arrangements tailored according to the history of the service, the political regime/context, territorial conditions, technical developments or social trends.

Over the last 20+ years, at least four models of public sector change have gained a considerable scientific and practical attention. First of all, new public management is said to be the most influential concept that is most broadly introduced by leaders of public sector reforms. The key features of new public management include:

- the strive for productivity of public sector who tries to make decisions on maximization of quantity of the services delivered to citizens with a hope to reduction in spending,
- service orientation of the public sector who identifies its role not as a provider but also as a listener who needs better knowledge on the requirements paved by citizens,
- public policy that is better executed by the administration,
- marketisation of services replacing the traditional public service production,
- accountability for results that can only be part of administration on condition it improves the ability to deliver the truly expected services, and
- decentralization as a general rule of highest level of service responsibility at the lowest level of the governmental bodies[40].

The global popularity of new public management movement, so much associated with the book by Osborne and Gaebler[41], can be also described by two underpinnings. Managerial approach and market are the two founding pillars for the new management. G. Larbi describes this two pillars as a transfer of new managerial techniques to administration and the pressure to introduce market regime to public service provision. The reasoning here is basically made over the assumption that with no change, neither traditional public service provider can maintain the required level of efficiency in its performance, nor can the citizens be left over

[40] Kettl D.F.: The Global Public Management Revolution: a report on the transformation of governance, Washington, 2000

[41] Osborne D, Gaebler T: Reinventing Government. How the Entrepreneurial Spirit is Transforming the Public Sector, Reading, 1992

with little interest in their consumer needs[42]. We believe that Central European countries has already introduced some of the ideas and mechanisms mainly due to the reforms of its political regimes[43]. However, as Campbell and Coulson note, the main differences to the Western countries are based on the time span of introduction of the two pillars of governance. Namely, for Central European countries, the legislation and its power to legitimize actions on public service has been introduced nearly in parallel to managerial efforts and reforms at various levels of self-government. In the Western countries, the regulations introduced long before the managerial turn so they could easily get matured for stable system. Also, the issue of discrepancy between democratization of public services and efficiency in their delivery has been widely discussed in the Central European countries. For instance, for Austria and Poland, the deregulation of monopolies and the "powering" of citizens to vote by their feet has been introduced. The same goes for Hungary and its marketisation of services held in the 1990s.[44] In 2003, Illner describes the Czech system of governing as much more resistant to market-based actions and more bureaucratic-biased one. Even though, as he mentiones, various forms of contracting-out and join-ventures can be observed, a more traditional pattern is more common for the communities in the country[45].So one of the counclusions may be that the Central European countries do not follow the same speed of managerial reforms, even though the spirit of changes is pretty much visible.

Public governance is the second model of public management (*sensu largo*) that has been widely discussed in practice and gained interdisciplinary research interest. The idea of governance, despite its obvious meaning in the English-speaking countries[46], has been introduced to put focus on the extended engagement of various actors involved in the

[42] Larbi G.: The New Public Management Approach and Crisis States, UNRISD Discussion Paper No. 112, Geneva, 1999

[43] An interesting investigation on the Central Europe and the redevelopment of public sector system can be found in: Coulson A., Campbell A.: Local Government in Central and Eastern Europe: The Rebirth of Local Democracy, Routledge, New York, 2008

[44] Kersting N., Vetter A. (eds.): Reforming Local Government in Europe. Closing the Gap between Democracy and Efficiency, Springer Fachmedien Wiesbaden, 2003

[45] Illner M.: Thirteen years of reforming sub-national government in the Czech Republic [in:] Kersting N., Vetter A. (eds.): Reforming Local Government in Europe. Closing the Gap between Democracy and Efficiency, Springer Fachmedien Wiesbaden, 2003, p. 261-282

[46] For the English speaking nations, apart from the enriched meaning we refer to as a model, governing as well as governance may have a very common understanding of dealing with policy at national/sub-national level and thus it makes enormous problems in non-English countries to find a sound translation for the term. The approach to formulate 1) the general public framework in the territory, 2) the policy or 3) to manage the execution of the service in a joint (whatever the partner originates from) manner, seem to be the most concise meaning of governance.

provision of services[47] and in the wider sense, the process of public consultation, policy-making and its implementation. The governance is very often characterized by[48]:

- strategic approach to development at any scale of public sector intervention, and especially introduced by performance of sub-national governments cooperating with the citizens,
- a longer perspective of planning (strategic planning),
- efficiency and effectiveness built around the performance of public sector who pursuits the opportunities and resources outside its stock,
- joint responsibility of all the actors involved in the processes of service delivery,
- responsiveness seen in the engagement of administration to react to the needs of citizens,
- transparency of public actions due to open access to information on public activities, as well as
- enabling the citizen to take part in decision-making process by democratic bodies and further representation of individuals/groups.

The potential uptake of control by many actors may provoke a question on the risk of blurring the responsibility under the framework of governance process. Nevertheless, the interdependency of those involved in the process and the particular interest of the final user to secure his/her service needs may be the driving force to gain knowledge on ways to achieve best performance in a situation where hardly any public institution can handle alone the turbulent environment and its changes impacting the financing and standard of public sector services.

The two latest concepts, namely – new public service and open public services seem to call for more human-centered approach to what/how the service is offered to the citizen. J.V. Denhart and R.B. Denhardt[49] who are in particular associated with the new public service introduce even more citizen-centered model that builds upon the following principles:

[47] Stoker G.: Governance as theory: five propositions. International Social Science Journal, 50. (155), 1998, p. 17-28

[48] For more on the application of the governance concept, see i.e.: Montanheiro L., Kuźnik F., Ochojski A. (eds.): Public and private sector partnerships : sustainable success, Sheffield Hallam University, Sheffield, 2003; Barczyk S., Ochojski A. (eds.): Entrepreneurship, governance, local and regional development, Wydawnictwo AE Katowice, 2005; Barczyk S., Ochojski A.: E-teams Method. Handbook on Co-operation Towards Effective Policy Making, Wydawnictwo AE Katowice, 2007; Baron M., Ochojski A.: Joint action plan: methodology and praxis, GAPP, Katowice, 2011

[49] Denhardt J.V., Denhardt R.B.: The New Public Service: Serving Rather than Steering, Public Administration Review, November/December 2000. Vol. 60. No. 6, p. 549-559

- strategic action requires democratic reaction and background, so the collective and partnering effort is a vital condition of achieving governmental policies,
- citizens and not customers should be served, to stress that business and customers have different relationship formed on the market basis and basically other than public sector service provider and citizen where trust is a keyword for shared public interest,
- performance and productivity should not be valued more than people, thus an inclusion of citizens is necessary,
- public service entrepreneurship is by no means necessary if that does not bring meaningful contributions to citizens, and
- serve rather than steer when offering service to citizens i.e. pay attention to meet shared interest and not necessarily to steer the new directions.

The very citizen-oriented, and to some extent risk-free biased concept has been challenged against the economy of globalised world. Nevertheless, the lesson to be taken home on refraining from market-based operations and managerial support to running the services offered, is more about to remind us that behind economy there is democracy and all the new "birds" introduced by the reforms of so called old public administration should simply not loose public values from the horizon.

The other concept, i.e. open public service was introduced by the British Government as a starting point for the movement initiated by the new management reforms. With the need to respond to fiscal pressures and broadly understood demographic changes, new demand for public service arises. The expectations change and more personalized services are preferred by citizens. Thus, the basic assumptions of open public services include:

- open environment by means of new freedoms in neighborhoods and communities and putting power to people's hands instead of pure state control,
- accountability aiming at enlarging the scope and incentive to be imaginative and effective by the providers of the service as well as result-based payment in services driving better outcomes and value-for-money,
- choice and decisions made by individuals that are followed by funds,
- better access to information that allows true understanding of diversity of provision and maintaining the competition to raise standards across public services,

As it is still a recent political declaration under execution, the open public services, should be seen rather as a "living concept" with strong reformative aims. What makes the reform interesting is the definition of governing in the new era where

> *"…governments at all levels become increasingly funders, regulators and commissioners whose task it is to secure quality and guarantee fair access. Both central and local government are adapting to develop new capabilities to make the most of the new opportunities and stimulate more openness and innovation in public services"*[50].

As we can see, recent years bring a common belief that mature democracies has decreased the decisive and implementative role of key actors of public sector as the only ones who are able to influence economic and social change in territories[51]. At the same time, additional supply of public goods (i.e. network infrastructure, social services) is created as a consequence of urbanisation and industrialisation. Moreover, as we can read after C. Boix, there is a constant increase in the "demand" for public spending "translated" as a consequence of developing industry as well as demographic changes (the ageing of society, depopulation – especially with regards to the change in preferences of public spending)[52]. What does it mean in practice? Basically, the consequences should be seen in much higher involvement of public and private organisations delivering the services. At the same time, it is the public sector who interestingly overtakes the mission of the business sector. Therefore, it shows clear signals abort the necessity to create new and competitive products, enlargement of consumer markets, pursuit of the image in the international arena. Still, there is a difference in these organisations' mission (logic/aims)[53] as well as axiological foundations of their activities and their consequent changes[54]. M. van Wart discusses the questions on public sector values, such as: to what extent should it keep its stability and where the limits of its elasticity are[55]. With all the turbulence in public sector settings, a question comes back if it should be more of a

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[50] ---------, Open Public Services 2013, HM Government, 2013 downloaded at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200077/Open_Public_Services_2013_full_report.pdf

[51] Peters B. G., Pierre J.: Governance Without Government? Rethinking Public Administration, Journal of Public Administration Theory, vol. 8, no. 2, 1998, p. 223-243

[52] Boix C.: Democracy, Development and the Public Sector, American Journal of Political Science, vol. 45, no. 1, 2001, p. 1-17

[53] Alexandrou A. and Colpus C.M.: Public Sector Values: The Impact of Public Private Partnerships [in:] Montanheiro L., Spiering M. (Eds.), Public and Private Sector Partnerships: The Enterprise Governance, Sheffield Hallam University Press, 2001, str. 17-30

[54] Box R.C.: Running Government like A Businestr. Implications for Public Administration Theory and Practice, American Review of Public Administration, Vol. 29, No. 1, March, 1999, p. 19-43; Van Wart M.: 'Reinventing' in the Public Sector: The Critical Role of Value Restructuring, Public Administration Quarterly, 19, 4, 1996, str. 456-478; Van Wart M.: Changing Public Sector Values, New York and London: Garland, 1998

[55] Van Wart M.: 'Reinventing' in the Public Sector… (1996)

monopoly or rather it should be open to the competition? In mature democracies, a widely observed shift between public and private sector can be seen[56]; even if the control over the activities and service delivered is held by the policy-makers, the process of production and service delivery is very often transferred to the private operator. The management of public services is arranged with the use of techniques and methods specific to the business and so is the promotion of competition in public sector[57]. Public sector takes over the techno-economic rationality that has always been a part of the business sector. On the other hand, there is much more civic involvement accepted and performed in "soft services" basically linked to the public sector (i.e. education, culture, social care). The civic and voluntary sector is also active in the filed of socio-economic regeneration of cities[58]. For the territories that see opportunities in a more pro-active and entrepreneurial approach to local development, the changing path of public sector management practices seems to be ideal, especially in terms of spatial planning. It means that public and private sector (both business and voluntary) become co-authors of development processes and the public sector is no longer the body with a unique status of allocator and regulator[59].

Finally, due to all the new factors that arise to overtake a common rigidity of bureaucratic structures, the public sector is pushed to changes both at intra-organisaitonal and inter-organisational level. Thus, policy-makers, public managers in municipalities/regions focus on new roles, being more of a social networkers and business partners in various networks[60]. It is very common that public sector local organizations become partners or even co-founders of clusters, industrial districts or local productive systems[61]. The experience of cooperation in the non-traditional administrative roles, i.e. external contacts and relations built between teams actively involved into networks that stimulate new organisational alignments, enforce much more performance-oriented organizational structures and ease the work under the scheme of projects/task forces. Definitely, it is not common everywhere to form an ad-hoc team ready to challenge a sudden situation and freely built relations across the organisation.

[56] Flynn N.: Public Sector Management, Prentice Hall, 2002

[57] Kooiman J.: Research and theory about new public services management. Review and agenda for the future, International Journal of Public Sector Management, Vol. 9 No. 5/6, 1996, str.7-22; Alford J.: Towards a New Public Management Models. Beyond „managerialism" and its critics. in: Public Management. Critical Perspectives. [in:] Osborne S.P.(Ed.) Routledge, London, 2002, p. 292-312

[58] Lloyd G., McCarthy J., Fernie K.: From Cause To Effect? A new agenda for urban regeneration in Scotland, Local Economy, vol. 16, no. 3, 2001, p. 221–235

[59] Healey P., Khakee A., Motte A., Needham B.: European Developments in Strategic Spatial Planning, European Planning Studies, vol. 7, no. 3, 1999, p. 339-355

[60] Cooke P., Morgan K.: The Associational Economy, Oxford, Oxford University Press, 1998

[61] For a broader description of networks and recent cooperation patterns see for instance.: McNaughton R.B., Green M.B (Eds.) (2002): Global Competition and Local Networks, Ashgate, or Cooke P., Morgan K. (2000): The Associational Economy. Firms, Regions, and Innovation. Oxford University Press

Nevertheless, we can observe a rather promising and quite popular practice called in scientific debates resilience[62]. And it eagerly enters the public sector logic. Going even further, the growing ability to manage so called wicked situations[63]; that are complex and twisted in their nature; brings new expectations regarding internal organisation of work and tasks in municipal and regional structures. Simply speaking, there is a strong change in the process of governance from policy and change management to a new logic of co-generation of knowledge and consequent formation of new methodical approaches.[64] The key issue here is that it can easily add up to or replace a traditional form of self-governing. Especially, this is true for enacting various actors of change into the managerial process of top managers, whose knowledge on drivers of success in operations / strategic actions may be a vital source of better performance and success of change control. Last but not least, a new understanding of control is believed to enter the public sector rationality. The traditional *control over resources* approach that allows to completely steer the processes of service provision, because the public sector has been appointed to do so, is replaced by a *knowledge on* approach. Knowledgeable public sector offers more to individuals while still preserving the general accessibility to public goods. It also intends to be more efficient in its arrangements by means of private (business, civic, network) contributions to knowledge on how to deliver more public value[65].

1.5 The basics of demography-driven changes in public service economy and management

Demography and cost of public service are interrelated within the supply-demand logic of public service delivery. To decompose the variables that play role, the supply-side issues of economics of public service and political & management impacts over the territorial system needs to be well known. The same applies to the demand-side characteristics and its

[62] Christopherson S., Michie J., Tyler P., Regional resilience: theoretical and empirical perspectives, Cambridge Journal of Regions, Economy and Society 2010. 3, p. 3–10. Shaw, K. and Maythorne, L.: Managing for local resilience: towards a strategic approach, Public Policy and Administration, 28 (1), 2013, p. 43-65

[63] H. Rittel H., Weber M.: Dilemmas in a General Theory of Planning, Policy Sciences, 4, 1973, p. 155-169; Huggins M., Hilvert Ch., Tackling wicked problems takes resident engagement, Public Management, August 2013, icma.org/pm, p. 7-11

[64] Barczyk S., Ochojski A.: Nowe ujęcie modelu governance. Od polityki i zarządzania w miastach do współdziałania w perspektywie kompleksowych wyzwań rozwoju lokalnego [w:] Praca zbiorowa pod red. Brandenburg H., Projekty lokalne i regionalne - najlepsze praktyki, Uniwersytet Ekonomiczny w Katowicach, 2013 (w druku) [*Eng. title* A new model of governance. From policy and management in cities to local governance in the perspective of wicked problems]

[65] Heartley J.: Innovation in Governance and Public Services: Past and Present, Public Money and Management, 2005, p. 27-34

demographic parameters. Nevertheless, the linkages are not linear and provoke many research questions.

Local decisions of political and managerial nature may highly influence the economic context of delivery in terms of supply size, quality and costs. The economics of public service offers well conceptual background to public decisions on allocation of resources for the benefit of public service users. It is so, as the optimum of local public goods provision and welfare belong to the public sector economics. Nevertheless, political doctrines and respectively the management of public services are extremely influential when it comes to the amounts and quality of infrastructure and service offered. On top of that, political or managerial decisions imply and regulate the delivery process to make it either market, quasi-market or non-market based. Substitutive or competitive goods may also impact the overall supply of a given service in a locality. Therefore, for cost-based studies, there are two issues that may be somehow critical to identify the possible variation on the supply-side. Namely, this is the understanding of national legislation and its differences as well as overall knowledge on the reforms of management and public service delivery trends. National legislation makes difference across countries. It may be very generous to service provision takers as it enhances the availability of goods and service or it may imply several limitations of social or economic nature. It also regulates the institutions (rules and roles) of the delivery opening the competition on the market or imposing a protected environment. On the other hand, there are numerous standards of services that vary from country to country or even from county to county. The management of public services has evolved as a competence extending the pure administrative routine of the administration. The reasons of change are more or less the same everywhere – to make the service standardized – up to the standards of the supplied product, to make it available if the goods are not well supplied and to reduce the cost for the general public. Thus, with knowledge on the globally discussed challenges of economic nature, we may further expect a general pressure on local public service operators, be it a public or a private-based organization, to make use of available resources in a more efficient and effective way in a longer perspective[66].

On the other hand, there comes the demand for the service of public nature. There are numerous factors that influence the demand of individual or collective customer of public services. The wealth of citizens can be meaningful for the choice of service provider. Whereas public services can be either guaranteed or simply pre-secured, the size of the market makes

[66] A sound example of radical efficiency practices is described in NESTA, Radical Efficiency. Different, better, lower cost public services, London, 2010

differs for both cases. For the network services, the size of the market may change significantly with the decisions made individually. The transactions here are often made freely by the consumers and there is more choice among them based on their purchasing potential and individual preferences. One can chose either to use his car or to use public transportation. For social services, the supply is often regulated by legislation and thus its demand size may change rather by individual decisions within the limits or privileges established nationally or locally. Social care, may be demanded as a privately owned day-care that is financed 100% by the user. For public housing, it is usually offered to specific groups and the market is highly regulated here. The decisions on services under health care can also be very much of individual nature within the legislation that guarantees a system of secure and common delivery, either through public, private or mixed schemes. With all the factors that make difference to the demand side, the volume and the structure of the consumers may be even more serious issue for the for public service economics, and the cost calculation respectively. As we can read from Kuckshinrichs:

> *"…demographic change will be accompanied by a decline and a change in the demand for infrastructure services. An ageing population will need different services and it will use infrastructures in a different way, thus putting pressure on the system."*[67]

For the studies on demographic change, there are at least five variables that make picture complete. Namely these are: fertility, mortality, immigration and emigration, as well as, the population structure itself[68]. For the fertility rate, it is not only the factor that enlarges the volume of population but it changes the amount of specific goods (including the public delivered) consumed by the population. There are numerous fertility-based theories that link in-depth the economics and fertility[69] including the income-fertility relation and other factors. For the mortality, the entry to the health system, that is believed to be more available in urbanized areas, is a primal factor conditioning the reduction of population. However, other factors, such as life-style and genetic issues may be of significance for population size under and its mortality factor. Nevertheless, the demographic change made based on the mortality is said to have generally fallen down within the last century. Again, migration is a part of a broader spectrum of a general issue present nowadays, i.e. movement of people. By no means,

[67] Kronenberg T. and Kuckshinrichs W.: Demography and Infrastructure. National and Regional Aspects of Demographic Change, Springer Dordrecht Heidelberg London New York, 2011, p. 2

[68] As the book does not aspire for the extensive demography-based theoretical study text, the identified factors are described in order to provide general knowledge on the components of demographic change rather than complete investigation on demography issues. The main effort is to understand the processes and relations in-between demographic change and public service provision.

[69] L. Weber gives a substantial overview. For more see: Weber L.: Demographic Change and Economic Growth. Simulations on Growth Models, Springer-Verlag, Berlin Heidelberg, 2010, p. 25 and following

should it be made equal but one should recognize that with greater movement opportunities, made possible due to rise of transportation technologies as well as the free flow of capital globally, the movement and consequently migrations become one of the most influential aspects of territorial socio-economics changes. With labour markets changes and agglomeration effects the economies of urbanized places become different and require different service in terms of volume and quality. Also, more issue arise with need for compensation of external effects and free-ride effects in most-urbanised (metropolitan) areas. Finally, the population structure makes difference to what is expected as public service and infrastructure. On one hand it is the working structure described by the three population generations (children, parents and grandparents generation) and on the other hand it is the population pyramids. The amount of population falling into each of the generations conditions the demand on the and the level of particular service consumed. In a very simplified manner, we can also see the working population as those whose engagement into work (real employment factor) allows tax based flows that enable the local governments to make the spending affordable to users. The pyramids of population make sense in a similar way to potentially describe the demand. Nevertheless, they offer a gender structure that may be in some circumstances a clue on how the demand for services may be growing. This holds true for health care particular services that are more linked to sex and age structure, for instance.

The changes of population, and more importantly the knowledge on population structure and natural growth factor become one of the key issues for the service providers to deal with the economics of public infrastructure provision. It is so as we may expect that with life-time expansion, the savings of people become higher due to less consumption needs. As explained by Modigliani in 50s and 60s of XX century, the Nobel Prize winner, aging may affect saving rates. Of course, we may see it the other way round, with age people may tend to spend less on basic goods and more on exclusive goods that deliver more value. So, what may be of greater significance for public service economies, is definitely the coexistence of shrinking workforce with declining population. Due to reduced demand for commercial and public goods, the production and therefore the labor demand to consumer needs may decrease over time. The decline in general labor demand may further result in unemployment as well as greater assistance needed from the public sector on social care, health care or even public housing. We may assume that the higher the depopulation over time is, the greater the risk of additional public spending is needed[70]. On the other hand, some experts refer to extended

[70] In that respect, definitely, strong global linkages of local economy may be influential here preserving some radical problems with resilient businesses and stable economic conditions. Anyway, the endogenous sector may

need for education to meet requirements of the demand on the labor market[71]. So for the public service economics, it is not just a matter of demography seen in terms of linear function of population equaling the demand but it makes the relation more age and "competence" specific[72]. The need for more help from the public service and especially in social and health care is believed to increase with the age. Nevertheless this hypothesis is not very firm and we should not forget that health status of individual or a group is the key factor behind healthcare spending and not necessarily the age. Health societies regardless the age may not really ask for more health care or social care deliveries. Again, as an average, the older the people, the consumption of healthcare increases faster than for the younger ones. So with the studies made by Reinhardt[73] we may conclude that general growth spending to heath care is observed because it increases through technological progress and relates to health services of any age group. Also he mentions that aging is rather minor factor for healthcare costs because it affects any age group. When it comes to public transportation, costs of mobility and technological factors including the new pressures determine the changes in transportation and road infrastructure. Even though, the degree of mobility for older people is said to be lower it may increase over time. What is more important it is that shrinking population leads to a decline in transportation demand[74]. But, here it is the spatial aspect (population density) that makes difference for the cost and delivery of transport infrastructure.

The cost issue, whatever the reasons of impact are, is two-fold. On one hand it is the fixed cost that does not change over time per definition and the longer the time of covering the higher the general cost of reduced demand for the service. Secondly, the calculation of variable costs matters in the average cost of the service. Some researchers call for fit-to-the market size service provision and forecasting the market. As for the idea of fit-to-demand infrastructure services, lower fixed costs must result in higher variable costs in the first period. They average cost then can be reduced with a market decrease. Nevertheless, not all the infrastructures can be adapted easily and over time to such optimal infrastructure structures. This may hold true with some limitations for future scenarios and future service

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be more vulnerable to this pattern than the exogenous sector of economic base that is basically dependant on non-local demand.

[71] Weber L.: Demographic Change and Economic Growth. Simulations on Growth Models, Springer-Verlag, Berlin Heidelberg, 2010, p. 72

[72] Kronenberg T. and Kuckshinrichs W.: Demography and Infrastructure. National and Regional Aspects of Demographic Change, Springer Dordrecht Heidelberg London New York, 2011, p. 46 and folowing

[73] Reinhardt U.: Health care for the ageing baby boomers: How serious is the problem? [in:] Siebert H.: Economic policy for ageing societies, Springer, Berlin, 2002, p. 232-262

[74] Just T.: Demographic developments will not spare the public infrastructure. Deutsche Bank Research., 2004

and infrastructure offers[75]. For the already made costs of service provision in areas suffering depopulation, we believe that basically it turns high due to high fixed costs and can only be:

- reduced by either internal restructuring or market-based enlargement to the optimal demand or
- covered by beneficiaries if not subsidized.

In other words, lack of agreement to downsize the future infrastructure that is for sure backed-up by the political pressure of givers rather than takers and/or civic resistance may result in further cost-burning effects with a hope that moderate fixed costs may be somehow reduced by a potential increase of service takers paying less with decreasing variable costs.

To conclude, demographic trends impact on the provision of public infrastructure in four fields. (1) Apart from many other growth-significant factors of the territorial development[76], the declining and active population in the labour market reduces the revenue side of public budgets that in turns affects income-related tax takes. (2) The size of the users grouped according to the service demand influences overall economic performance of the providers of public services, regardless their ownership. Public housing or social service may be good examples here. (3) The ageing is widely believed to make changes to the structure of demand for public goods, even though it is not a simple change in consumption of for example health care service. (4) Cost-efficiency is deep-rooted in fixed costs of infrastructure that once reduced may result in average gaining (less costly infrastructure of depopulating areas with temporarily higher variable costs). However, what makes the issue even more challenging is that despite general knowledge on possible future major shifts in the social and economic environment of public organizations including the demographic change it is still very likely to affect the performance of public service providers[77]. The decision-making process does not ideally deal with the changes and often tries to adapt to the change instead of dealing with it in advance. On top of that, the issue of demand-based cost is not often related to a proper focus that shifts new infrastructure costs to system maintenance.

Based on the above-discussion, we assume that costs are highly related to the volumes consumed, the standards delivered and territorial aspects of delivery (i.e. effects of agglomeration, spatio-environmental issues, etc.). Therefore studying costs in such a complex

[75] A sound example is explained by Just T.: Demographic developments will not spare the public infrastructure. Deutsche Bank Research., 2004

[76] Such as for example: technology, R&D, knowledgeable institutions and governance structures.

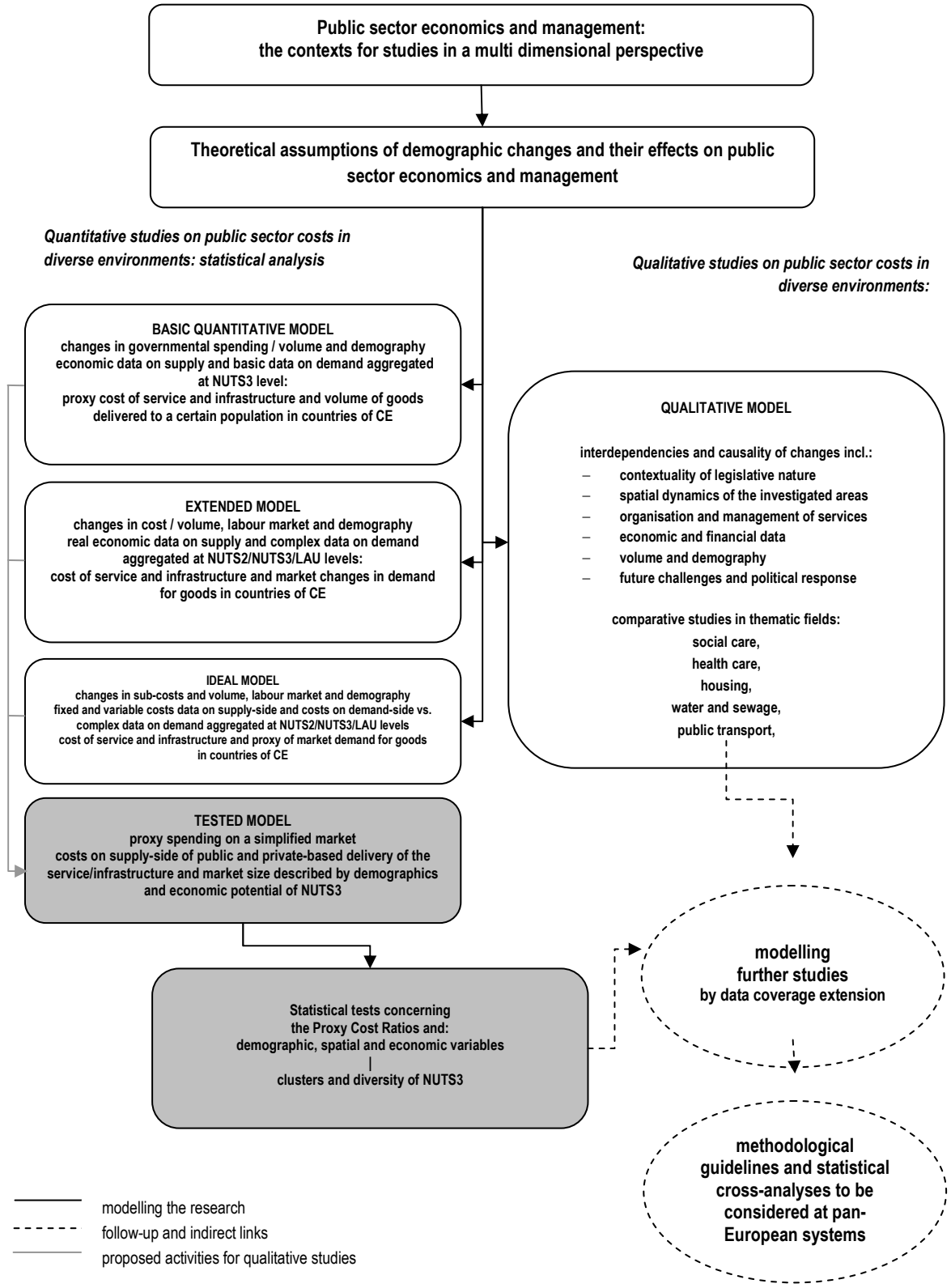
[77] Ashworth R., Boyne G. and Entwistle T.: Public Service Improvement. Theories and Evidence. Oxford University Press, Oxford New York, 2010

environment is a challenge within national borders. It gets even more challenging for a cross-country analysis. There are numerous factors that need to be identified for such a study, including the national legislative framework, size of the market, local context of territorial development, practices of service management and finally policy targets.

The multi dimensional perspective provokes for qualitative studies in order to better indentify the contexts and recognize the in-depth conditions for setting up the prices and more importantly: generating costs to users and fixed and current costs carried out by providers of services. Fig. 1.X offers a description of the model for researching public sector service costs where the integrated model of qualitative cost analysis should be offered in line with the quantitative models of cost analysis.

The modeling of research departs with clear intension to integrate public sector economics and management analysis supposition with specific theoretical and practical assumptions for demographic change. Why is it then so intriguing for a research on costs of the services? Demographic change described here involves changes in population size and age-structure of the population as they can be interestingly differentiating market size and preferred service quality. Also, it deals with changes of population density. So, with the goal of the research to identify the costs and their variations in the cross-country perspective, the main hypothesis orientates the research over the two issues: (1) the cost of local public services is significantly correlated to population change and (2) volume and demography are not the exclusive change factors behind the cost shifts of public service in Central European countries. Therefore, a mixed approach towards the hypotheses is provided by means of quantitative and qualitative research models. The application of the tested model (marked in grey), as described in chapter 1.6, differs from the initial research perspective and reveals that the applied models often are a compromise of what we need to know and what can be measured in a reliable way with data availability limitations. Further lessons can be drawn from the next chapter that describes how the study has been finally structured and what has been accomplished as investigated and tested model.

Fig. 1.X. Modeling the research on demography-related public service costs



Source: own representation

The quantitative model of studies on public sector costs in diverse environments might be tested in the very basic form of standardized information on spending of governments at certain levels of administrative responsibility (a sum of NUTS3 spending as a representation of LAU1 and LAU2 tasks) and checked against the volume consumed. In that sense, proxy cost of the service can be identified[78] for further cross-country analysis[79]. This is, however, more a picture representing the supply-side of the services as the volume is often measured according to the total offer and not the exact demand. The amount of water used may be different to the amount of water delivered as it may leak or be used for technical processes, for instance. The deviations may not be the most significant bottleneck. The volume of the service does not reflect the number of consumers yet. The demand side can be represented by basic data on total population and age structure, for example. So the correlation analysis needs to be introduced between the changes in spending on service per volume[80] and demography changes to see any links between the spending on particular service and changes in population. This basic model has some limitations on top of which is the missing part of information on the funding of public services made with non-public funds. Non-for-profit organizations and private organizations may not necessarily represented in local/regional government budgets.

The extended model, therefore calls for exact cost data by volumes and is reflected by a real cost-based statistics of bodies dealing with public service whose budgets are transparent by nature. In other words, changes in aggregated data on costs by fields of services under public budgets and costs in financial records of companies delivering the service should be tested against various levels of demographic change including natural growth, migration processes, total change in population as well as labour market changes[81]. What makes the model even more complex is the idea of making the analysis at different levels of statistical

[78] Spread by the types of services such as networked services and social services or investigated in details including specifics of the public fields of: transportation, roads, water, sewage, housing, social care, health care and others.

[79] This type of analysis has been made under the EEA at the national level covering some of the European countries. Nevertheless, this study did not offer any idea on the links to demographic change. See: European Environment Agency: Assessment of cost recovery through water pricing, Technical report 13/2013; also it can be seen as a survey exercise made by BDEW German Association of Energy and Water Industries. See: VEWA Comparison of European Water and Wastewater Prices, 2010 (https://www.bdew.de/internet.nsf/id/DE_VEWA-Survey_summery_Comparison_of_European_Water_and_Wastewater_Prices/$file/_12_seiter_vewa_studie_bdew_ENGL_V2.pdf)

[80] The Proxy cost of the service should be introduced here as the alternative to public spending.

[81] As described in the classical economic base models.

territorial units so as to exclude the effects of small NUTS3 regions or other potentially significant statistical deviations.

Finally, the ideal model, that most probably takes on the full spectrum of research interest in the studied area recognizes fixed and variable costs buried by operators of specific public service, no matter their ownership and additionally looking for total costs covered by the users of the given service/stream of services[82]. This is probably the most complex idea of studying the costs to compare them in a cross-territorial review. The study has obvious limitation as it calls for enormous amount of data gathered in two different perspectives[83]. On the side of the interest, there is the demographics of the territories including all the variables and detailed representation of the demand and its components.

Lessons learnt from studies on public sector[84] confirm that neither a simple quantitative nor a single qualitative investigation makes sense in describing the economics of the service. The complexity of contextual factors makes it truly challenging to dig into any detailed statistical analysis if not accompanied by a substantial knowledge on various change factors among which can be found the following:

- legislation,
- spatial dynamics of the investigated areas,
- organisation and management of services,
- economic and financial data
- volume and demography
- future challenges and political response.

As one can see, the investigation and its consequence – any justification of the decisions taken by governments or business is a relative issue rather than a direct hint to be translated into strategies of public service operators and funders.

[82] Including such a dilemma of how much it costs me to get to the place of service provision in remote areas as a part of the general cost of the service.
[83] The user-based costs perspective is a subject of questions on how to make the standard of such calculation.
[84] For example: recent studies on public service efficiency that has been published as a monography that deals with education, roads and e-government. Barczyk S., Baron M., Biniecki J., Kuźnik F., Ochojski A., Szczupak B.: Efektywne świadczenie miejskich usług publicznych. Analiza - zarządzanie - polityka. Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, Katowice 2013

1.6. Methodology of the study

Further descriptions in this chapter become an entry point for empirical studies presented in the book. All the works done have been set up and implemented under an umbrella of the ADAPT2DC project[85]. ADAPT2DC was established as a strategic project of the Central Europe programme[86] in order to help tackling issues of governance and management of infrastructures and services in regions and cities affected by demographic change.[87] Throughout the whole project the studies presented here emerged very challenging as they required conceptualization of new analytical models and acquirement and compilation of data that have not been present at cross-country level. Conceptually they have been well placed in ADAPT2DC structure with assumptions like

> *Main objective of activities is to provide knowledge base about the demographic change in Central Europe area and its consequences for the development of the regions and cities. The special focus is put on analysis of changes in infrastructure (transport, road, water, housing) and service (social, health care) costs that are related to the process of population shrinkage. Such knowledge base will then be used in work packages that concentrate on development and implementation of new governance solutions by which problems of shrinking regions and cities could be innovatively tackled."*[88]

Nevertheless with every step taken new pitfalls concerning data availability and comparability occurred across the countries. A methodological approach to dealing with these issues is presented in this chapter.

Having in mind the previously described assumptions on public service sector economics and management, the studies have been mainstreamed into works concerning public service effectiveness (efficiency). Within this context a sound classification by Herrala et al.[89] was used to start up method development. Citing Herrala efficiency can be used in following dimensions:

- allocative efficiency: refers to the responsiveness of service to public preferences [by Leibenstein, 1966],

[85] Grant Agreement number 3sCE414P4: New innovative solutions to adapt governance and management of public infrastructures to demographic change, co-financed by the European Regional Development Fund.
[86] See www.central2013.eu for further information on this programme supported by the European Union.
[87] The issues of demographic change have been thoroughly studied within the ADAPT2DC project in a socio-economic background analysis: Šimon M., Mikešová R. (2013)
[88] ADAPT2DC Application Form.
[89] Herrala M.E., Huotari H., Haapasalo H.J.O.: Governance of Finnish waterworks – A DEA comparison of selected models, Utilities Policy 20. (2012), p. 64-70

- technical efficiency: measures a firm's success in producing maximum output from a given set of inputs [by Farrell, 1957 and Leibenstein, 1966],
- price efficiency: measures a firm's success in choosing an optimal set of inputs [by Farrell, 1957],
- cost efficiency: refers to the least amount of inputs used to produce a fixed level of output(s) at minimum possible cost [by Coelli et al., 2002],
- scale efficiency: defines the optimal size and scale of operations of an entity under efficiency analysis [by Cubbin and Tzanidakis,1998 and Coelli et al., 2005].

In parallel the approach enclosed the supply and demand sides. It was planned so to achieve an effect of observing the same issues from both service provider (producer) and citizen (customer) perspectives. Moreover this refers to an assumption that in adaptation processes public sector may not only decide upon the supply of service, but can also actively manage the demand. According to the OECD, successful demand management can include: providing effective service outcomes to meet identified community needs; assessing if the need is changing; continually improving the services provided to the community and the way that the operator delivers them; responding appropriately and within the available resources, and driving demand to preferred channels. Thanks to this kind of approach a package of benefits for the community may emerge, encompassing: better services and awareness for the community, reduced complexity, improved access, increasing confidence and greater consistency in services.[90]

Anyway, obviously, the traditional approach via the supply side also plays a vital role. Especially when it comes to the issues of scale. For Central Europe this is quite a challenging issue as multiple areas face at least one of the two factors: oversized infrastructure (planned for a bigger demand related to resource-intensive industry and growing usage in households) and population shrinkage. Distinctive studies show that utility managers accustomed to expanding their physical networks to meet an ever-growing demand for water in some areas were forced to confront an unfamiliar and unwelcome phenomenon: over-capacity in parts - or even across all - of their infrastructure network. Moss, who reviewed numerous research reports from Central and Eastern Europe, claim that in serious cases the drop in consumption

[90] Managing Service Demand: A Practical Guide to Help Revenue Bodies Better Meet Taxpayers' Service Expectations, OECD Publishing, 2013, p. 12-14

is so great that it is causing major problems for the technical functioning and economic feasibility of infrastructure systems.[91]

Finally a dimension related to level of urbanisation and / or population density was taken into consideration in order to distinguish territories of different spatial patterns. It is important as the specifics of service delivery strongly differ in urbanized and rural areas. Of course, there is, again, no consensus as to the most suitable variable for capturing density, the extent of space over which density should be characterized and the scale at which density should be measured.[92] Nevertheless we believe that even basic indicators or urban-rural types of classifications, used for example by Eurostat or ESPON, are of significant value. Especially though there are several studies that depict some kinds of correlation between land use patterns and service provision costs. In a relevant work by Solé-Ollé and Hortas Rico local spendings on: community facilities, basic infrastructures and transportation, housing and community development, local police, culture and sports, and general administration were scrutinized against urban development patterns across Spain. The results indicated that low-density developments led to greater provision costs in all the spending categories considered, with the exception of housing. The impact on total costs accelerated at very low and very high levels of sprawl. The results suggested that in municipalities with a spatially expansive urban development pattern, the provision costs of public services increase initially and then, if the urban sprawl advances further, costs continue to rise.[93] On the other hand there are serious opponents to that kind of approach. Mainly one can easily prove that even though many public services are somehow standardized across countries the quality may differ and as such the delivery cost may vary. Thus, to identify the cost impact of agglomeration, control for differences in the level of public services provided should be applied. And typically, the level of public services cannot be observed directly. This is due to the very nature of public goods: they are not traded on a market.[94] A complex study over Germany allowed separate estimation for about 40 government functions. While the results differed across functions, the aggregated effect of agglomeration on the budget was insignificant. This implied that, in the aggregate, per capita cost of public services is constant, i.e. there is no cost disadvantage for highly

[91] Moss T.: 'Cold spots' of Urban Infrastructure: 'Shrinking' Processes in Eastern Germany and the Modern Infrastructural Ideal, International Journal of Urban and Regional Research, Volume 32.2, June 2008, p. 436-51

[92] Solé-Ollé A., Hortas Rico M.: Does urban sprawl increase the costs of providing local public services? Evidence from spanish municipalities, Document de treball 2008/6, Institut d'Economia de Barcelona

[93] Solé-Ollé A., Hortas Rico M. (2008)

[94] Büttner T., Schwager R., Stegarescu D.: Agglomeration, Population Size, and the Cost of Providing Public Services. An Empirical Analysis for German States, Discussion Paper No. 04-18, Zentrum fur Europäische Wirtschaftsforschung GmbH

urbanized nor for sparsely populated regions.[95] Different findings in this matter may even lead to open arguments like it was in case of Cox and Utt vs. Litman with the latter writing "Cox and Utt analyzed various government expenditures by more than 700 municipalities in 2000. Based on the analysis results they conclude that density and growth rates do not significantly affect per capita local government expenditures, so smart growth provides no significant development or service cost savings. Their analysis contains several critical errors."[96] Even though there is a feeling that the radically different results of cited studies may origin from applied methodologies, this should be commented not in terms of better and worse methods, but rather as another signal showing that approaching cost-based indicators in public sector in relation to some other parameters is not a simple task. There is no single method, neither a standard solution.

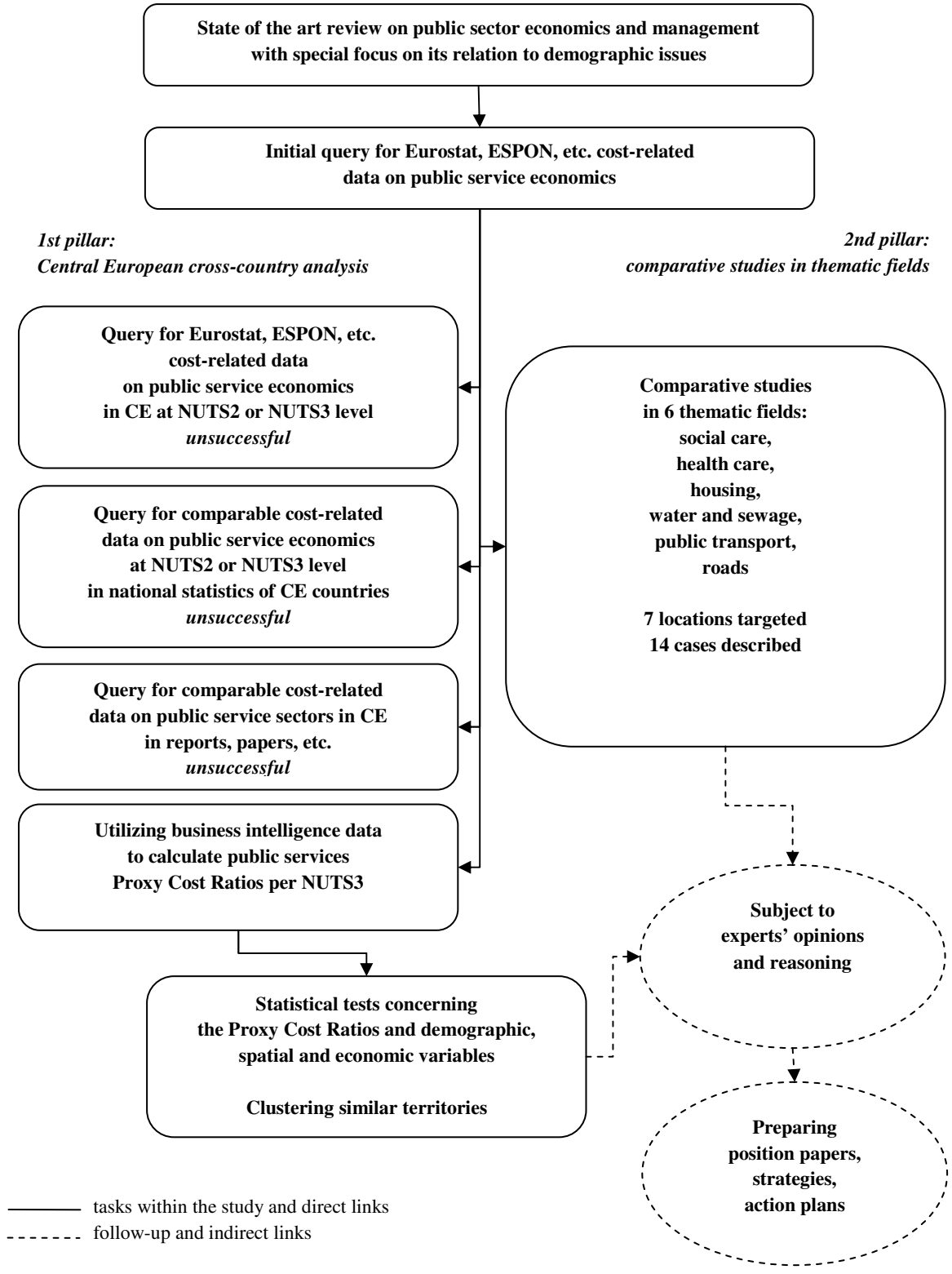
Also the other existing studies allowed preassumptions concerning various methodological challenges that are going to make "analysis of changes in infrastructure (transport, road, water, housing) and service (social, health care) costs that are related to the process of population shrinkage" across Central Europe difficult. For example in water sector many of known studies concern a limited area and - probably due to state-related contextual issues - a single country.[97] This leads either to choosing the case study descriptions that are hardly relevant for a cross-cutting reasoning or to applying statistical, econometric and operations management methods, even knowing that not all processes can be properly represented. Quite equal observations have been noted for waste management, which is not within the scope of ADAPT2DC but is similar in characteristics.[98]

The original research plan for the ADAPT2DC study concerning analysis of changes in infrastructure (transport, road, water, housing) and service (social, health care) costs that are related to the process of population shrinkage was developed by the task force of: Institute of Sociology of the Academy of Sciences of the Czech Republic, Leibniz Institute for Regional Geography, University of Economics in Katowice and Thuringian Ministry for Building, Regional Development and Infrastructure. The initial concept was based upon accessing Eurostat data and national statistics in order to match them and combine into a Central

[95] Büttner T., ...
[96] Litman T.: Smart Growth Savings. What We Know About Public Infrastructure and Service Cost Savings. And How They are Misrepresented By Critics, Victoria Transport Policy Institute, 25 April 2013
[97] Abbott M., Cohen B., Chun Wang W.: The performance of the urban water and wastewater sectors in Australia, Utilities Policy 20 (2012), p. 52-63
[98] Bel G., Fageda X.: Empirical analysis of solid management waste costs: Some evidence from Galicia, Spain, Resources, Conservation and Recycling 54 (2010), p. 187–193

European database for NUTS 3 regions, to be followed by reasoning and policy recommendations.

Fig. 1.X. Analyzing local public service costs in Central Europe: the approach



Source: own representation

Nevertheless this approach proved that there is almost no extent comparable data on public service economics gathered across Europe that could be supportive in policy making. Therefore the alternative methods have been applied by the ADAPT2DC partnership[99]. An overview of the whole study and its follow-up is presented on figure 1.X.

1st pillar: Central European cross-country analysis

The official European statistics and indicators can be found in Eurostat website[100]. As already pinpointed, the pan-European data were of a first choice for this research with expectancy of acquiring at least basic comparative information needed. Data availability has been investigated in December 2011 and January 2012 with regards to usefulness in terms of data depth (NUTS levels) and in particular targeting:

- usefulness in terms of contexts analysis (economic and social data: drivers and outcomes of shrinking regions) and
- usefulness in terms of project key words (infrastructure and services; costs) and
- potential usefulness in terms of project outcomes (improvement of governance structures based on direct change in service cost and indirect change – i.e. improvement of service and infrastructure effectiveness / quality / availability / attractiveness / etc.).

Nevertheless, the results of the query showed that within the thematic scope of the research data availability on the level of NUTS3 was limited to regional macroeconomic and demographic statistics. Also data specific with regards to project key words was limited to NUTS0-NUTS2 levels, anyway most of the data was rather related to the technical parameters not economic side. Some interesting data concerning costs of services and infrastructure could be available, but only presented cumulatively at countries level in general categories of expenditure[101]. For economic indicators that would be of importance – if delivered for at least NUTS2 or NUTS3 level – see table 1.X.

[99] Thuringian Ministry for Building, Regional Development and Infrastructure (DE), Leibniz Institute for Regional Geography (DE), Institute of Sociology of the Academy of Sciences of the Czech Republic (CZ), Regional Authority of Usti Region (CZ), Észak-alföld Regional Development Agency Non-profit Limited Company (HU), National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation (IT), University of Economics in Katowice (PL), Regional Authority of Małopolska Region (PL), Urban Planning Institute of the Republic of Slovenia (SI), Office for National Economic Planning (HU)

[100] http://epp.eurostat.ec.europa.eu

[101] As mentioned, a parallel empirical investigation on demographic change in Central Europe has been run by ADAPT2DC partners (see: Šimon M., Mikešová R.: A socio-economic background analysis. Demographic Change in Central Europe, ADAPT2DC project, Institute of Sociology of the Academy of Sciences of the Czech

Tab 1.X. Availability of potentially relevant Eurostat indicators and data sets

NUTS LEVEL	INDICATOR
NUTS3	none
NUTS2	none
NUTS1/0	- Expenditure of selected health care functions by providers of health care, per inhabitant (hlth_sha1h) - Expenditure of selected health care functions by financing agents in health care, per inhabitant (hlth_sha2h) - Expenditure of providers of health care by financing agents in health care, per inhabitant (hlth_sha3h) - Expenditure on education in current prices (educ_fiabs) - Expenditure on education in constant prices (educ_fiexpc) - Expenditure on education as % of GDP or public expenditure (educ_figdp) - Expenditure on public educational institutions (educ_fipubin) - Expenditure on public and private educational institutions (educ_fitotin) - Total public expenditure on education (tps00158) - Education: Spending on Human Resources (tsiir010) - Private expenditure on education (tps00068) - Public expenditure on education (tsdsc510) - Annual expenditure on public and private educational institutions per pupil/student (tps00067) - Annual expenditure on public and private educational institutions compared to GDP per capita (tps00069) - Social protection: Expenditure - Tables by functions, aggregated benefits and grouped schemes, in currency (spr_exp_cur) - Social protection: Tables by functions, aggregated benefits and grouped schemes - in MIO of national currency (spr_exp_nac) - Social protection: Tables by functions, aggregated benefits and grouped schemes - in MIO of EUR (spr_exp_eur) - Social protection: Tables by functions, aggregated benefits and grouped schemes - in MIO of PPS (spr_exp_pps) - Social protection: Tables by functions, aggregated benefits and grouped schemes - in PPS per head (spr_exp_ppsh) - Social protection: Tables by functions, aggregated benefits and grouped schemes - in % of the GDP (spr_exp_gdp) - Social protection: Tables by benefits - sickness/health care function (spr_exp_fsi) - Social protection: Tables by benefits - disability function (spr_exp_fdi) - Social protection: Tables by benefits - old age function (spr_exp_fol) - Social protection: Tables by benefits - survivors function (spr_exp_fsu) - Social protection: Tables by benefits - family/children function (spr_exp_ffa) - Social protection: Tables by benefits - unemployment function (spr_exp_fun) - Social protection: Tables by benefits - housing function (spr_exp_fho) - Social protection: Tables by benefits - social exclusion n.e.c. function (spr_exp_fex) - Social protection: Tables by benefits - all functions (spr_exp_fto)

In that extent available data was relevant for the fields of: social protection services, education, health and was spanned across the late 1980s and 2010 with different available time periods in case of various data sets. Because interesting information is aggregated mainly at state level there was no possibility to use Eurostat data for analysing local public services delivery, management nor governance. It seems to be quite a challenging issue in case the

Republic, 2013). Hereby, a disproportion can be observed with regards to demographic versus economic data availability.

European communities really push on tackling structural changes in local public services, as there is simply no sound economic database that could support this process. Our observation, thus, resembles the latest OECD statements:

> *However, while countries have started to make use of the various sources to produce and analyse data at different geographic levels, significant methodological constraints still exist, making it a challenge to produce sound, internationally comparable statistics linked to a location. These constraints include both the varying availability of public data across OECD countries and the different standards used by National Statistical Offices in defining certain variables.*[102]

Especially an issue of difficulties in encompassing local / subregional flows that cover areas not defined as single administrative nor statistical units is of an utmost importance.

> *Although the OECD has taken important first steps in defining functional regions and urban areas and in establishing a methodology for reliable cross-country comparisons, there remains much to be done and many possible directions for future work. These include examining: the various kinds of interactions that cause functional areas to develop and the way these interactions are governed; the development of well-being metrics linked to where people live and how policies are implemented; and a common framework to connect socio-economic statistics to geographical information at different scales.*[103]

This kind of methodological disadvantage must be clearly marked, as numerous public services have not "pure location" (limited to administrative borders of a certain local government), but they usually spread over the territory. Especially network services like public transportation or water and sewage treatment are of this character. Anyway, commuting or e.g. accessing health care in neighbouring municipalities also blur the picture.

Since Eurostat data specific with regards to the need of the study is limited to countries levels, the availability of NUTS3 level data was cross-checked by the ADAPT2DC partners in national statistic offices, ministerial and regional repositories. The cross-check of availability and comparability of national data concerning costs of local public services delivery has been set up across the partnership as a possible way out of the situation in which Eurostat queries proved unsuccessful. All partners have been involved and requested to browse national statistic offices' databases as well as governmental and regional repositories. The partnership reviewed situation in the Czech Republic, Germany, Hungary, Italy, Poland, and Slovenia.

[102] OECD Regions at a Glance 2013, OECD Publishing, 2013, p. 16
[103] OECD Regions at a Glance 2013, p. 20

NUTS3 were considered as basic statistical units for data collection check. Timeframe requested included 2000-2010 perspective plus a year 1995. Infrastructure and service data described in national and sector specific statistics were investigated against cost-related parameters (cost, expenditure, demand, supply and bound external factors) during a period of March 2012 – May 2012. The results, presented in details in annex XX, showed that:

- some data concerning costs of services and infrastructure were available in national statistics on various levels including LAUs;
- national approaches to the collection of data concerning costs of services and infrastructure were different, on average similar datasets could be obtained maximum for 2-3 countries;
- timeframes of available data were not always equal;
- national methodologies of gathering and aggregating some data might differ even though the dataset name was matching.

In consequence there was no background national data that could become basic for a database covering all Central Europe countries. Even the simplest approach of comparing general local government expenditure on certain services was impossible. It was due to different delivery systems (especially organizing and financing services at different levels) as well as due to unavailability of data in some countries.

Following this statement the ADAPT2DC project partners agreed to review sector-related reports, newsletters, position papers, etc. in their national languages to browse for possible expertise and data on local public services that could be used on a partnership level and matched with source materials from the other countries if their scopes were similar. This procedure helped to obtain some interesting sector / case / place-specific information but of no value for the project in terms of establishing the Central European database.

Having in mind all above mentioned problems and pitfalls an alternative method was proposed based upon obtaining access to commercial business intelligence database and tracking corporate financial statements plus extracting information needed to offer a horizontal information on mechanisms and factors shaping the microeconomics of local public service delivery across Central Europe. This approach is very much alike to the problem and solution described by the OECD:

> *Official statistics produced by national statistical offices (NSOs) have traditionally focused on macro-based statistics and indicators, particularly in an international context. But as the world economy becomes more global, complex and diverse,*

comprehensive and good quality of micro-data has become an important tool for evidence-based decision making on complex issues. At the same time, rapid advances in computational capabilities have allowed for the processing of large databases of micro-data. [...] The creation and maintenance of databases gathering firm-level information across a wide range of countries has attracted a lot of attention in recent years; commercial firm-level databases (like ORBIS, AMADEUS, BANKSCOPE, etc.) are largely used within the business community and, more recently, by academic scholars.[104]

Therefore an access to business intelligence data (Amadeus by Bureau van Dijk[105]) was obtained by the University of Economics in Katowice. The database contains information collected at national official public bodies in charge of recording the annual accounts in a given country. In some cases, there might be information provided based on the direct contacts with the organisations. Nevertheless, the data represent the official, filed and audited account. Cross-national standardisation of the balance sheets as well as profit and loss accounts is a competence of the database provider. The exchange rates used for conversion of national currencies, are based on the International Monetary Fund publication and refer to the closing date of the statement. The organisations that are represented in the database cover:

- companies whose capital is divided into shares which can be offered to the general public and whose members are only liable for its debts to the extent of any amount unpaid on their shares;
- companies whose capital is divided into shares which cannot be offered to the general public. The liability of its members is limited to the amount of their shares. In some rare case, Limited Liability companies can be publicly quoted, and
- other legal forms: including companies where at least one partner is liable for the firm's debts or companies where there is only one shareholder.

Information on shareholders is also provided by the database. They include: corporations, private individuals, government bodies or collectively described entities (such as the "public" for listed companies).

Anyway it must be pinpointed that even though the financial reporting to state registers is obligatory, it is widely known that some businesses refrain from making their financial data publicly available. Moreover even though Amadeus operator and its contractors declare to

[104] Ribeiro S.P., Menghinello S., Backer K.D.: The OECD ORBIS Database Responding to the Need for Firm-Level Micro-Data in the OECD, OECD Statistics Working Papers 2010/01, 2010. p. 6
[105] https://amadeus.bvdinfo.com

make every possible effort to offer a complete data set, this is for sure that they cannot be able to provide a perfect match. Therefore the authors clearly state that calculations could only be based upon the best available data set extracted from Amadeus. We expect that the levels of possible bugs are similar across countries and thematic fields and as such they are considered a common constraint that have not seriously affected reasoning. Aggregated data for further studies – presented in Chapter 2 – were calculated out of precisely selected corporate records in Amadeus. The accompanying NUTS3 data has been derived from ESPON. The business activity NACE classification has been used for the purpose of the study. The primary NACE code was used to filter Amadeus records and obtain raw data on corporate performance in ADAPT2DC areas of interest. For detailed information consult table 1.X.

Tab 1.X. Dataset selection criteria

ADAPT2DC THEMATIC FIELD	RELEVANT NACE CODES	NUMBER OF AMADEUS RECORDS IN CENTRAL EUROPE PROGRAMME COUNTRIES* (AUTUMN 2013)	NUMBER OF AMADEUS RECORDS IN CENTRAL EUROPE USED FOR FURTHER CALCULATIONS
Water and sewage	3600 - Water collection, treatment and supply 3700 - Sewerage	5,788	3,178
Roads	4211 - Construction of roads and motorways	12,409	0**
Public transport	4931 - Urban and suburban passenger land transport 4939 - Other passenger land transport	14,706	5,418
Social care	8710 - Residential nursing care activities 8720 - Residential care activities for mental retardation, mental health and substance abuse 8730 - Residential care activities for the elderly and disabled, 8790 - Other residential care activities 8810 - Social work activities without accommodation for the elderly and disabled 8891 - Child day-care activities 8899 - Other social work activities without accommodation	23,843	3,178***
Health care	8610 - Hospital activities 8621 - General medical practice activities 8622 - Specialist medical practice activities	46,808	19,454
Housing	6820 - Renting and operating of own or leased real estate 6832 - Management of real estate on a fee or contract basis	215,973	754****

* Austria, the Czech Republic, Germany, Hungary, Italy, Poland, Slovakia, Slovenia
** No further analysis in the field due to misleading data
*** Further analysis limited to: Austria, Hungary, Germany and Italy
**** Further analysis limited to entities owned by public sector in Germany and Poland

Nevertheless the records could not be used in a full scope:

- the roads group was not selected for further analyses as companies' activities in a sector can hardly be territorialized and moreover the amount of missing or misleading data could result in irrelevant findings;
- the study over housing was limited to entities owned by public sector in Germany and Poland due to fact that the relevant NACE codes encompass much wider group (e.g. renting and operating business / industry premises) and apart from Germany and Poland there was no way to select relevant samples;
- further analyses in social care were limited to: Austria, Hungary, Germany and Italy because the entities in other countries provide very limited and misleading data upon their performance.

The main idea behind using the business intelligence database was to find a proxy or proxies that could exemplify the general ADAPT2DC idea of comparable approach to costs levels in service delivery. Even though it is possible to build upon several parameters related to revenues and profits as well as upon commonly used ratios, e.g. EBIT (earnings before interests and taxes) margin, ROE (return on equity), ROA (return on assets) – this is methodologically not applicable in the scrutinized system. The reason has been clearly discovered in project works described in Chapter 3. that showed how many different state / regional-based contextual factors impact service delivery; its management and economics. The values to be used must be us much independent of the existing contexts as possible. To ensure this, two parameters have been selected for further investigation. These are sales and costs of goods sold. Both of them are simple, clear and comparable proxies of demand-side costs (costs for beneficiary of public service paid either by a beneficiary or via public budgets) or supply-side costs (costs that service operators need to cover in direct link to service delivery). Unfortunately the aspect of costs of goods sold is not gathered through corporate reporting in all targeted countries. Based on this the sales value in defined NACE classes was selected as a key proxy of costs in further analyses. The method proposed for data aggregation was based upon the average sales referred to population. NUTS3 was a territorial level of analyses. Demographic change data, urbanisation profile and GDP per capita were

introduced as context data to enable analyses in territorial classes. The Proxy Cost Ratio applied in the study is presented in box 1.X.

Box 1.X. Proxy Cost Ratio concept

Sales value in defined NACE classes was selected as a key proxy of costs. The user Proxy Cost Ratio is calculated as follows:

$$PCR = \frac{\sum_{i=1}^{n} \overline{S}}{\overline{P}}$$

where:

PCR	is a Proxy Cost Ratio in NUTS [EUR/person]
n	is a number of business entity records in relevant NACE class registered in NUTS
$\overline{S}$	is an average annual sales value of a business entity in 2007-2011 [EUR]
$\overline{P}$	is an average annual population in NUTS in years 2007-2011 [persons]

In other words:

the PCR shows average sales of specific services per inhabitant of territory

The consequent methodological steps were undertaken in order to calculate the PCR out of the existing Amadeus data sets. They included:

- preparing the database divided into thematic fields (i.e. records filtering and extraction, records review, removing records containing missing data or removing misleading groups of records);
- inflation adjustment for annual sales values (all values were converted into 2007 prices);
- calculation of sales averages per business entity (done in order to minimize the risk of utilizing the unspecific observation of one year, the period of 2007-2011 was used as it allowed the widest possible coverage according to data provided by Amadeus);
- aggregation on ZIP-code level (to obtain average sales values per ZIP areas);
- ZIP-code-based sales values reclassification towards NUTS3 level (to obtain average sales values per NUTS3 areas);

- linking NUTS3 sales database to population database including average population (the period of 2007-2011 was used in accordance with data provided by Amadeus);
- PCRs calculation and integrity cross-check;
- applying Eurostat's Price Level Index to PCRs (to enable better reasoning upon the results of the cross-analyses of local public service costs in Central Europe, the PCR_PLI ratios were calculated to allow cross-country comparisons).

Software used was Microsoft Excel and ArcGIS 10. Euro exchange rates, supporting conversion from national currencies, were provided internally as an Amadeus functionality. Finally the following part of the study – summarized in Chapter 2 – included application of Microsoft Excel, IBM SPSS Statistics 21 and ArcGIS 10.

The pinpointed following part of the study contains statistical insight into the nature of PCRs and PCR_PLIs relations with demographic change, spatial and economic indicators. PCRs were used for state levels while PCR_PLIs were used for Central European level. Spearman's rank correlation coefficient was applied to test the dependence between PCRs and the other variables. It was selected as an alternative to Pearson's correlation coefficient, as it allows better description of relationship between two variables in a situation of many anomalies (outlying observations). The variables used for testing are presented in table 1.XX.

Tab 1.X. Variables used for r-Spearman correlation tests with PCRs / PCR_PLIs

ABBREVIATION	NAME	NATURE
POPCH_11_91	Long term population change (2011/1991)	Presents the demographic performance of a territory. Population in 2011 divided by population in 1991.
POPCH_10_00	Population change (2010/2000)	Presents the demographic performance of a territory. Population in 2010 divided by population in 2000.
AVCBD_10_00	Average rate of natural increase (2000-2010)	Presents the demographic performance of a territory. Average of crude birth rate minus the crude death rate of a population.
OADR_08	Elderly to active population ratio (2008)	Presents the demographic performance of a territory. Population aged 64 or over divided by population in working age (15-64 years).
DENS_08	Population density (2008)	Presents the spatial characteristic of a territory. Total population in a territory divided by its area.
GDP_08	GDP per capita in PPS (2008)	Presents the economic performance of a territory.

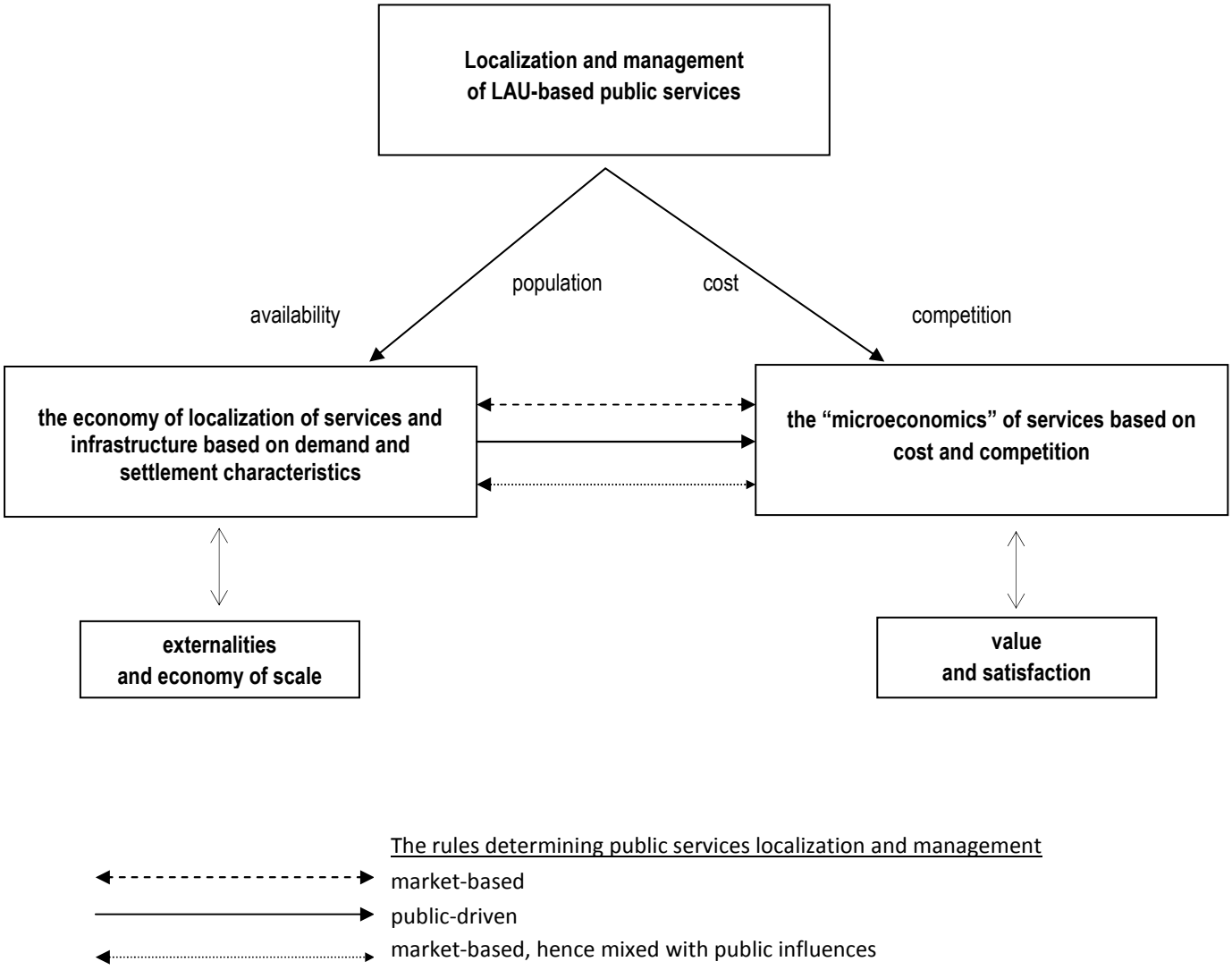
These indicators have been selected as the most reliable group of parameters due to fact that NUTS3 territorial split had been significantly changed for Germany and Italy which has not been fully followed by recalculations in statistical data. The most convenient to depict as many information as possible was to use NUTS3 rev. 2006 classification and therefore relevant ESPON data. Consequently the elderly to active population ratio and GDP per capita for 2008 were used in order to: enable full data coverage in NUTS3 split, fit in the analyzed period and prevent from applying the possibly misleading data of a crisis period.

The final step was meant to enable a better future transfer of solutions and best practices among Central European regions. Having assumed that this kinds of processes work best if applied to territories that share resembling characteristics, identification of clusters of similar territories regarding tested variables was applied. The taxonomy has been based upon Ward's method and k-means algorithm.

2nd pillar: comparative studies in thematic fields

In parallel to approaches concerning achievement of comparative data across Central Europe area a complementary method has been applied to provide case-based testing of public service adaptation to changing demographic situation in terms of public sector economics and policy making. The results are presented in Chapter 3. The so called thematic fields studies were methodologically based upon an assumption that four key factors for local / regional public service delivery must be encompassed, i.e.: population, availability, competition and costs. There is a difference in how privately and publicly-delivered / managed services are imposed by at least two of the factors. Cost (and thus price to end-user) can be calculated either based on market rules or it can be calculated differently with a condition that it should be available to as many users as possible. Competition can be limited or intentionally created by means of specific policy or national regime. Management of public services is therefore considered as the act of public choice / regulatory issues over cost and competition where decisions are made based on planning, policy and regulation. The decision however should is made strictly by careful understanding and focus on demand and character of settlement. In other words population and availability are among the key factors "externally" influencing localization and management of local public services (figure 1.X).

Fig. 1.X. Factors impacting local public services management patterns



Source: own representation

The field studies have been set-up in order to enable better understanding of particular determinants of changes in infrastructure and service costs; especially those related to demographic changes. The activity was meant as a microeconomic analysis of sample cases in infrastructure and service provision in shrinking areas, comparative in groups of two-three LAU1 and / or LAU2 cases. The comparisons have been done referring to trends and tendencies with wide context analysis. Direct price / cost comparisons were not taken into consideration as they might have resulted in misleading estimations and conclusions.

Six field studies have been arranged according to methodological guidelines (detailed descriptive questionnaire and spreadsheet file for quantitative data) elaborated by the

University of Economics in Katowice. They provided knowledge on service and infrastructure regarding: public transport, roads, water and sewage, social care, health care, housing. The ADAPT2DC partnership selected seven territories where detailed studies were held, i.e.: Vejprty (CZ), Saale-Orla-Kreis (DE), Ljubljana (SI), municipalities of Po Valley (IT), Katowice (PL), Jászárokszállás (HU) and Kozłów (PL). In 2012-2013 partners were requested to provide data and description regarding selected area. The study was arranged according to four interlinked parts. Part I dealt with public service overview. It pinpointed national and local contexts of service organisation and delivery, necessary to understand the economics of public services in scrutiny. Part II reviewed main economic data and indicators. Part III focused on quality of services and its political, social, technological and spatial determinants. It provided an enhanced picture of the economy of service in scrutiny. Finally, part IV brought conclusions on service provision towards policy making. As already mentioned, Chapter 3 reports the results and concise summaries per thematic field.

2. Cross-analyses of local public service costs in Central Europe

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A comparative approach to understanding spatial differences of public service costs in Central Europe is at the heart of the study. Within, it becomes especially challenging to identify the linkages to demographic, economic and other territorial aspects. The chapter provides an implemented model of investigation on service costs. It aims at overcoming technical and methodological bottlenecks of data availability in European and national statistics[106]. The research is offered as a conceptual and empirical solution especially targeted at statistical agencies supporting the policy-making processes. Business intelligence data has been obtained in pursuit of reliable estimations. Financial records of public service providers in Central Europe have been analyzed allowing the NUTS3 aggregation of micro-data unavailable elsewhere. The analysis is based upon the calculation of proxy cost ratios (PCRs) for: social services and infrastructure (social care, health care and public housing) and network services and infrastructure (public transportation, roads as well as water and sewage)[107]. In the chapter they are referred to as:

- PCR_SOC, i.e. PCR in social care,
- PCR_HEA, i.e. PCR in health care,
- PCR_HOU, i.e. PCR in housing,
- PCR_TRA, i.e. PCR in public transport,
- PCR_WAT, i.e. PCR in water and sewage.

The results provided in the investigation may be of significance at various territorial levels of policy-making processes. The identified interrelations together with the suggested taxonomy create an opportunity for policy actors and service operators to better understand similar

[106] For complete investigation path see chapter 1.
[107] The proxy cost indicators have been calculated for as many Central European NUTS3 areas as possible. Services related to roads have not been further investigated as the data set could not be considered as reliable for the scope of the study.

territories and their challenges and consequently share relevant knowledge and best practices in order to adapt to demographic change.

Please note, anyway, that the cornerstone of the study, i.e. the calculation of PCRs is of a unique nature and has been applied for the first time ever. Therefore it may occur that some observations on PCRs in NUTS3 areas may contain minor bugs. This is due to fact that there is no mechanism that could support full availability of needed data and their relevant classification. The possible misleading information share the same origin as numerous other studies utilizing big data, including studies done by statistical offices. They key negative factors that need to be pinpointed are allowing (not prosecuting) incomplete financial reporting in national register systems and using primary NACE codes as a sole criterion to categorize companies. The authors made every possible effort to utilize the best available data set – based upon business intelligence data in Amadeus by Bureau van Dijk – and minimize possible mistakes. Anyway the readers should understand that the following analyses refer to PCRs that are representative but not backed up by the complete data sets. So some individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.1. Local public service cost levels in CE countries

2.1.1. Central Europe level: cost ratios of local public services

To enable better reasoning upon the results of the cross-analyses of local public service costs in Central Europe, the PCR_PLI ratio has been proposed for the purpose of cross-country comparisons. The PCR_PLI is a PCR re-calculated with accordance to Eurostat's Price Level Index [PLI]. PLI is a part of purchasing power parities estimations that show how many currency units a given quantity of goods and services costs in different countries. Thus the effect of price level differences across countries is eliminated in comparative studies. The used PLI expresses the price level of a given country relative to a group of the Member States. The applied PLI aggregation is ESA95-based and refers to goods and services provided by government units (incl. e.g. medical products, appliances and equipment: outpatient services, hospital services, public health services; pre-primary and primary education: secondary education, post-secondary non-tertiary education, tertiary education; sickness and disability: old age, survivors, family and children, unemployment, housing, social exclusion).

The PCR_PLI levels for Central Europe are illustrated on maps 2.1.-2.5. The maps cover all countries for which reliable data aggregation could be done, i.e.:

- for Austria PCRs and PCR_PLIs were calculated for: health care, social care, water and sewage, public transport;
- for The Czech Republic PCRs and PCR_PLIs were calculated for: health care, water and sewage, public transport;
- for Germany PCRs and PCR_PLIs were calculated for: health care, social care, housing, water and sewage, public transport;
- for Hungary PCRs and PCR_PLIs were calculated for: health care, social care, water and sewage, public transport;
- for Italy PCRs and PCR_PLIs were calculated for: health care, social care, water and sewage, public transport;
- for Poland PCRs and PCR_PLIs were calculated for: health care, housing, water and sewage, public transport;
- for Slovakia PCRs and PCR_PLIs were calculated for: health care, water and sewage, public transport;
- for Slovenia PCRs and PCR_PLIs were calculated for: health care, water and sewage, public transport.

Anyway, while analyzing the maps the readers must be aware that service delivery systems vary throughout the countries. The detailed studies upon this are presented in chapter 3. For this particular reason final conclusions should always encompass contextual, legal, economic and spatial factors that may specifically affect PCRs in every country. The Jenks natural breaks classification is used for all maps presented in this study, due to the nature of compiled data sets.

For health care (map 2.1.), PCR_PLI for HEA presents average costs of health care service per inhabitant. Values of ratio are approximate due to incomplete data. The greatest spatial variation of ratio was recorded in Germany, while Italy, Slovenia and Hungary are countries with the smallest spatial variation of ratio. PCR_PLI for HEA shows some regularity. The highest values in most countries are usually in large urban areas: Bratislava, Kosice (SK), Graz (AT), Budapest (HU), Kraków, Poznań (PL). The maximum value of PCR_PLI for HEA was reported in Rhön-Grabfeld, Bavaria (DE). In this region several spa-towns are located. In Bad Neustadt, there is a headquarter of The Rhön Klinikum AG, which is leading private hospital group in Germany.

A limited study in housing (map 2.2.) has been provided. PCR_PLI for HOU presents average costs of housing service per inhabitant. Because of incomplete data, values of ratio

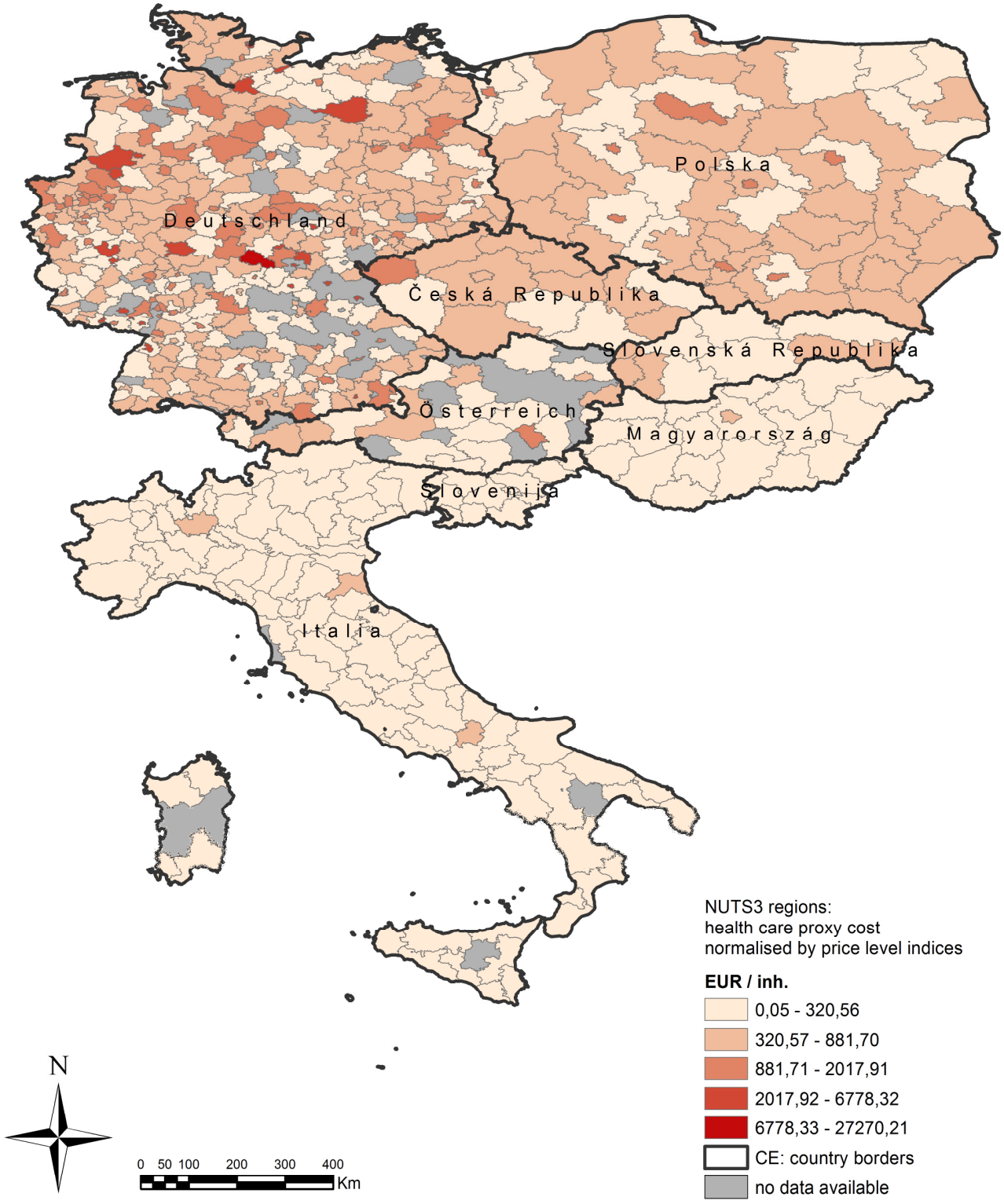
were compute for most regions in Poland and some parts of Germany. In case of Poland average value is approx. 16 EUR per inhabitant. The values of ratio are higher (about 40-80 EUR per inhabitant) only in some large urban areas, such as: Gdańsk, Warszawa, Katowice, Wrocław, Szczecin. In Germany PCR_PLI for HOU are more spatially diverse. The highest value are in Frankfurt am Main and Frankenthal (Pfalz). It is probably caused by location of large firms, which supply houses and housing facilities.

PCR_PLI levels in social care (map 2.3.) represent a limited picture of service costs. It presents average costs of social care services per inhabitant. The most diverse level of ratio can be observed in Germany. It is hard to explain the highest value of PCR_PLI for SOC in Steinfurt region. There are pretty much social care organizations like hospital, house care, and Caritas. In comparison with other regions, costs data from Steinfert is fairly complete (there are few firms with no data). In case of Austria, Hungary and Italy PCR_PLI for SOC are in the first numerical interval (between approx. 1 EUR and 200 EUR per inhabitant), However, analyzing the average values for countries we can see the differences between Austria, Italy where the average value is 78-75 EURO per inhabitant, and Hungary where the average values stands at only 3 EURO per inhabitant.

In case of water and sewage (map 2.4.) PCR_PLI for WAT presents average cost of water and sewage services per inhabitant. Levels of ratio are quite diverse in Central European countries. The maximum value of PCR_PLI for WAT was observed in Bologna (IT). It was caused mainly by location of HERA (Holding Energia Risorse Ambiente). HERA operates in the distribution of gas, water, energy, waste disposal the provinces of Bologna, Ferrara, Forlì-Cesena, Modena, Ravenna, Rimini, Pesaro and Urbino, and in some municipalities of Florence and Ancona. There is the same reason of the highest values in Germany. Location of large firm headquarter, which supply products also to another regions makes the highest values. For example Energie- und Wasserversorgung Mittleres Ruhrgebiet located in Bochum. This kind of firms operates on several markets. Both water supply and energy resources.

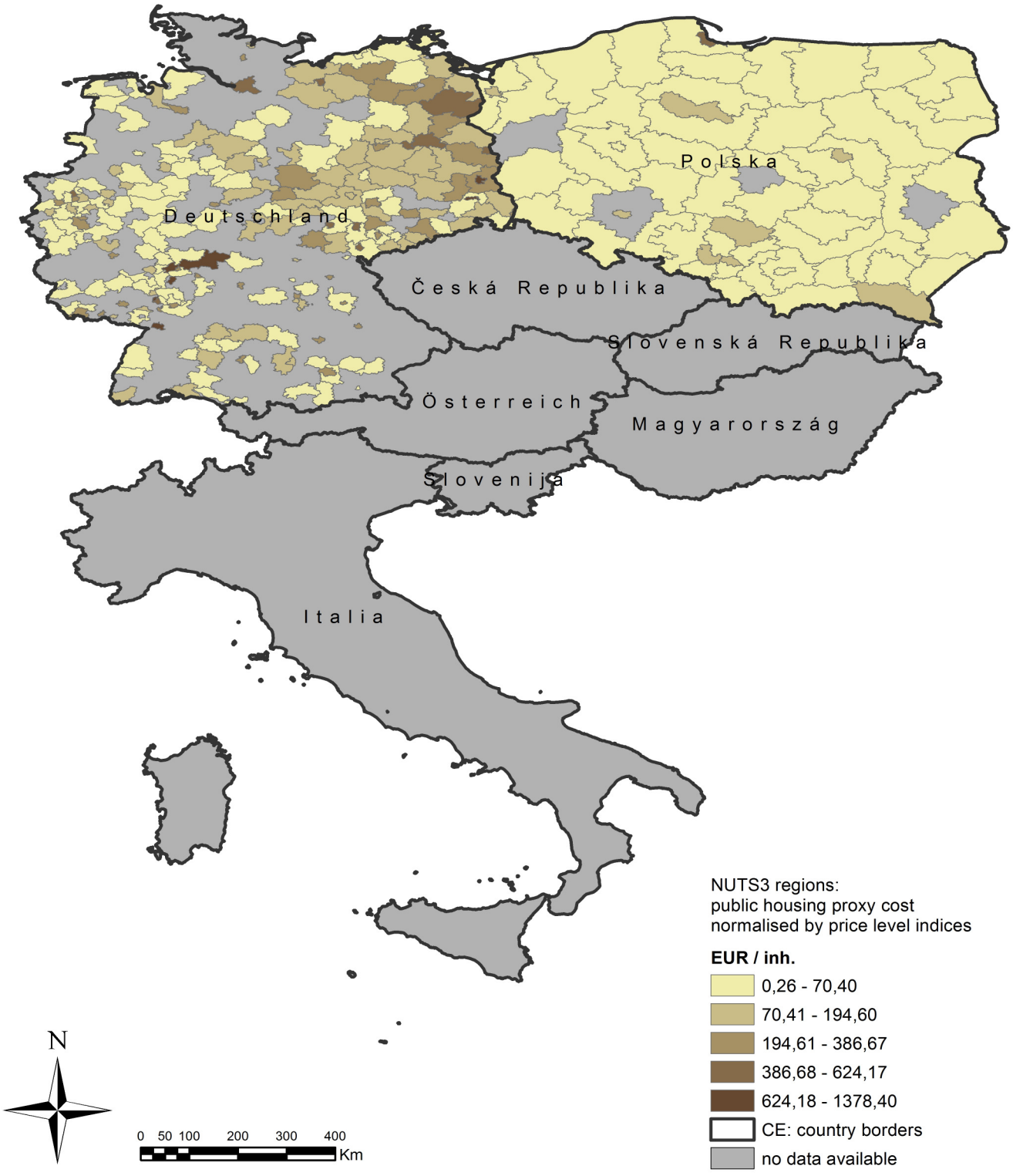
Finally, PCR_PLIs concerning public transport (map 2.5.) presents average costs of transport services per inhabitant. The highest value of ratio can be observed in western parts of Austria and some regions in Germany. The highest values of PCR_PLI for TRA is caused by location of large firms, which operate on different sectors (transport and others). For example in Frankfurt it is DB Energie GmbH. In this case large diversification of business activity makes results distorted. In other countries average values of ratio are pretty similar and are at the level 48 EUR per inhabitants in Slovakia to 88 EUR per inhabitant in Slovenia.

Map. 2.1. PCR_PLI_HEA levels in Central Europe



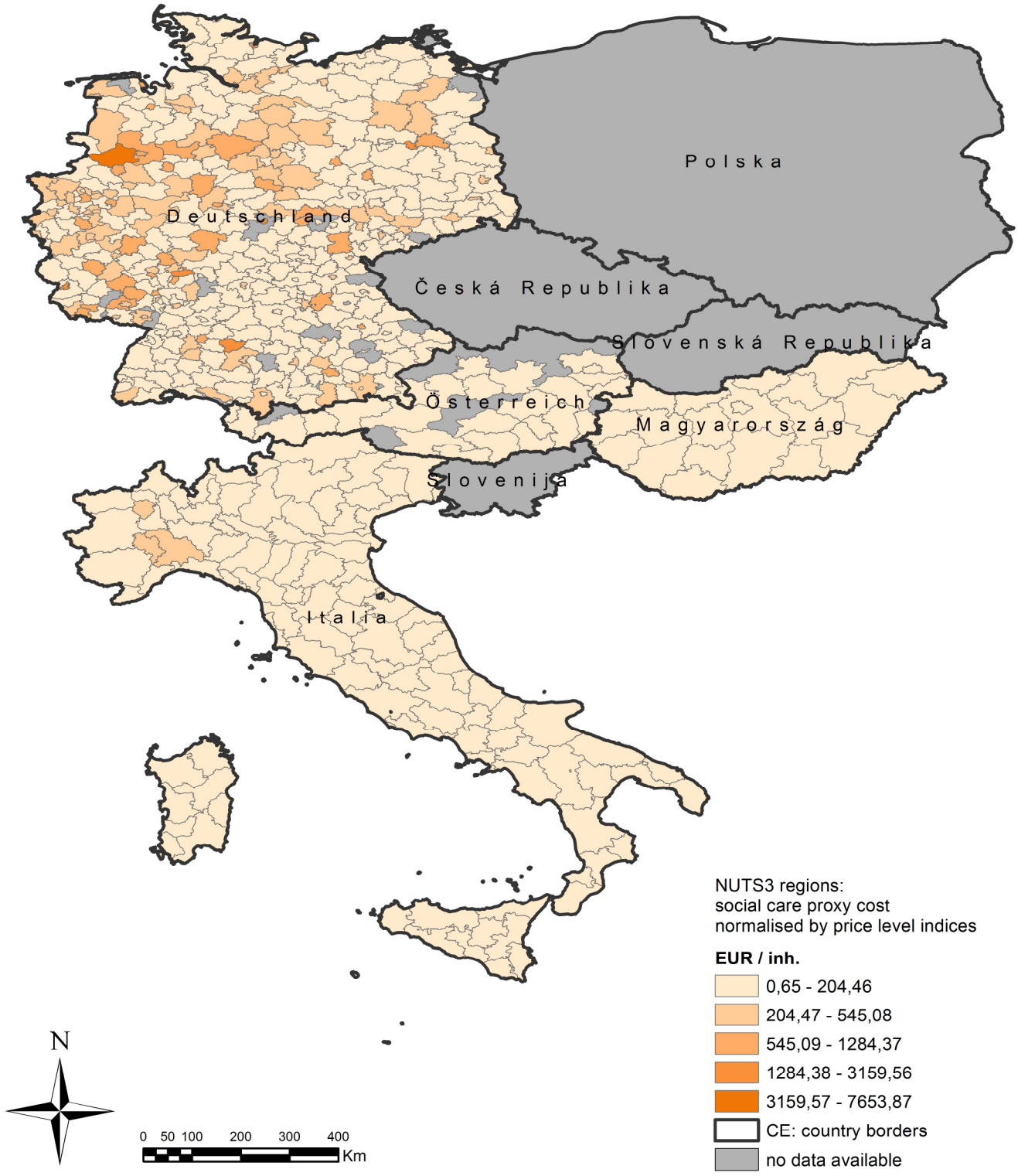
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. 2.2. PCR_PLI_HOU levels in Central Europe



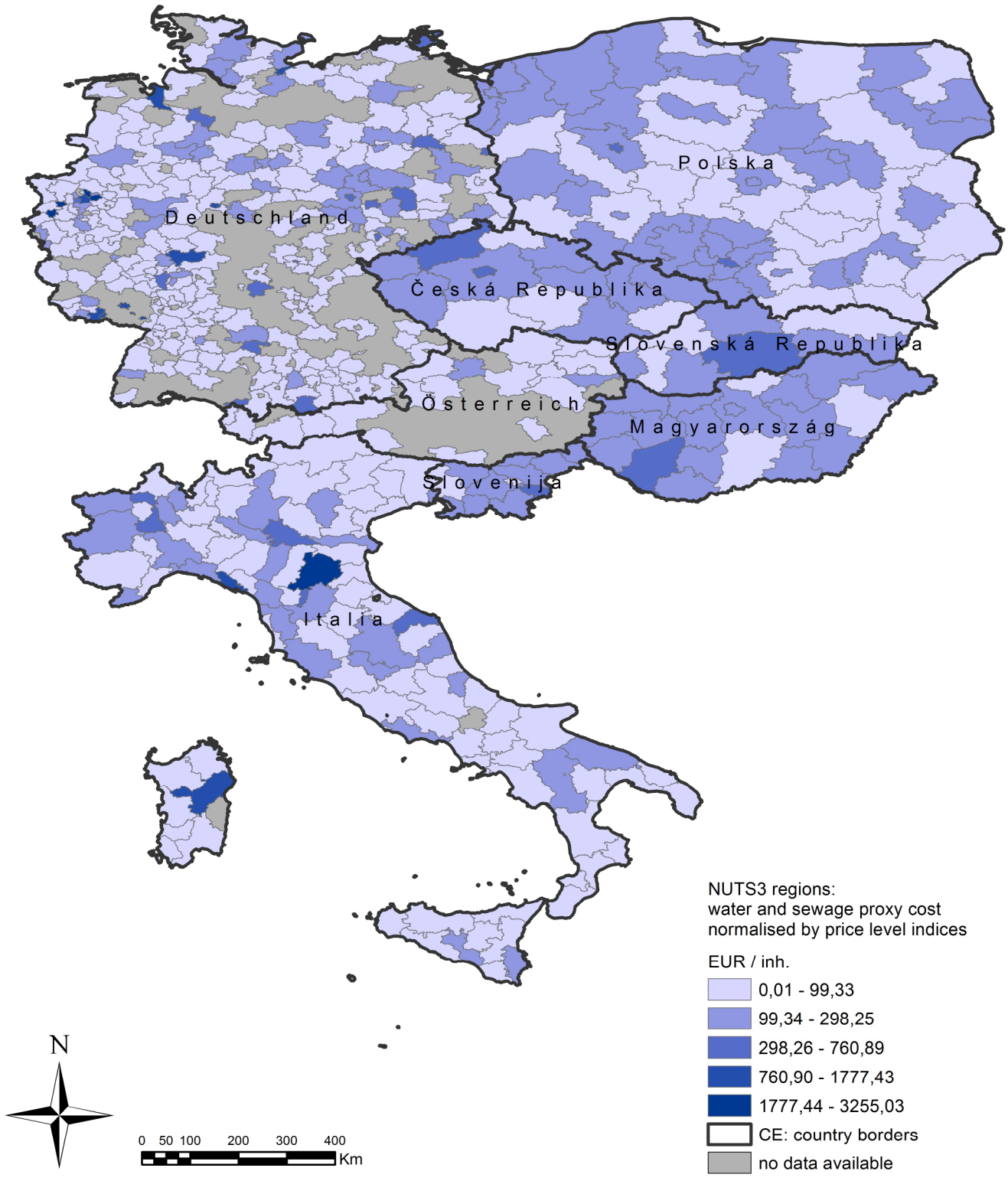
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. 2.3. PCR_PLI_SOC levels in Central Europe



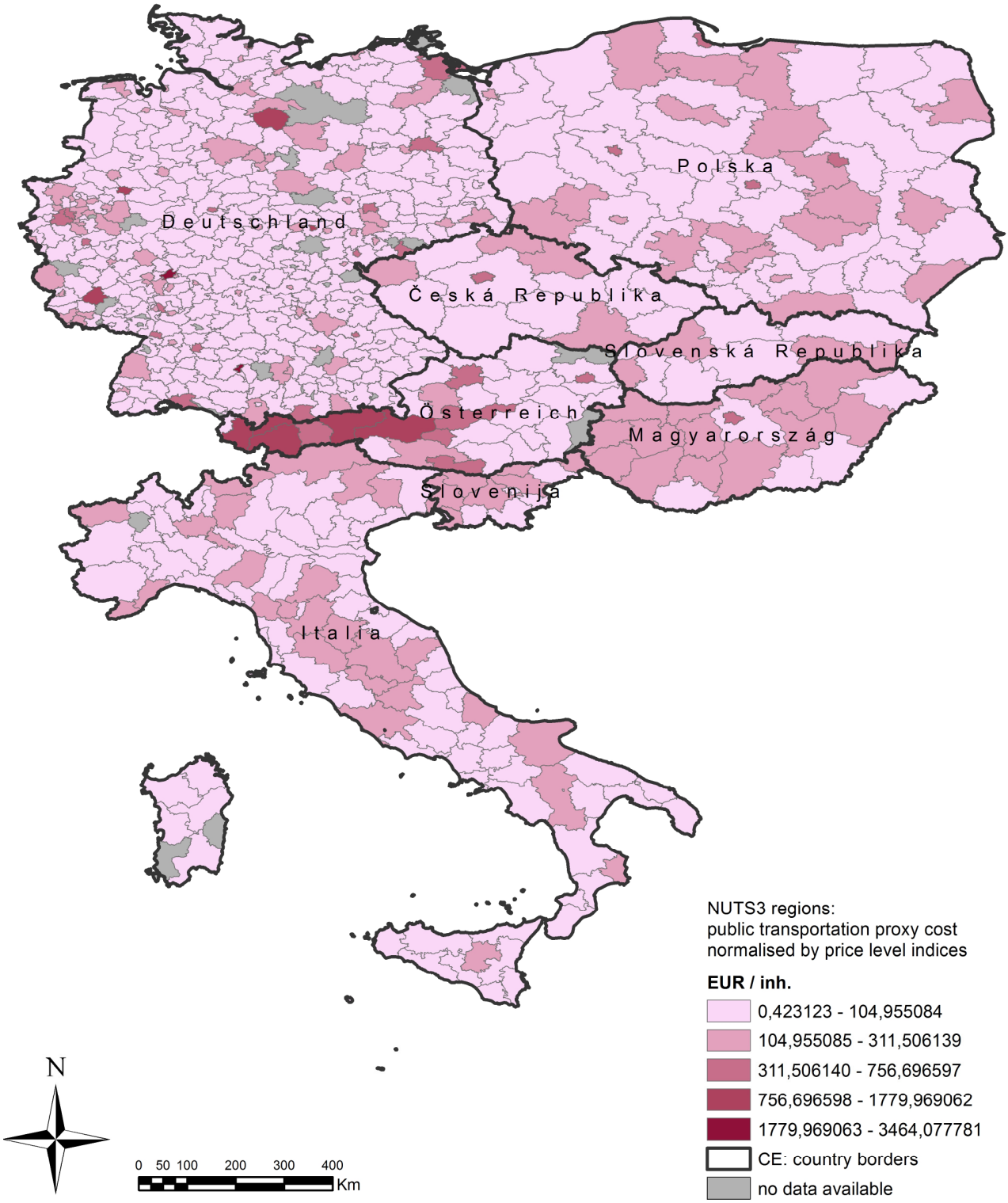
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. 2.4. PCR_PLI_WAT levels in Central Europe



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. 2.5. PCR_PLI_TRA levels in Central Europe



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

The statistical analyses over PCR_PLIs and:

- long term population change (2011/1991) - POPCH_11_91,
- population change (2010/2000) - POPCH_10_00.
- average rate of natural increase (2000-2010) - AVCBD_10_00.
- population density (2008) - DENS_08,
- elderly to active population ratio (2008) - OADR_08
- and GDP per capita in PPS (2008) - GDP_08

are offered to identify correlations with demographic change in a spatial and economic perspective. The source data has been acquired from ESPON. These indicators have been selected as the most reliable group of parameters due to fact that NUTS3 territorial split had been significantly changed for Germany and Italy which has not been fully followed by recalculations in statistical data[108]. The most convenient to depict as many information as possible was to use NUTS3 rev. 2006 classification and therefore relevant ESPON data. Consequently the population density, Elderly to active population ratio and GDP per capita for 2008 were used in order to: enable full data coverage in NUTS3 split, fit in the period covered by PCRs and prevent from applying the possibly misleading data of a crisis period.

The analysis for all available PCR_PLI observations in Central Europe (tab. 2.1.) show that PCR_PLIs are for all cases negatively correlated with POPCH_11_91 (not significantly for social care) and positively correlated with DENS_08 (not significantly for water and sewage). PCR_PLI_HOU is significantly correlated with all variables. PCR_PLI_HEA is significantly correlated with all variables but OADR_08.

[108] Amadeus data has to be territirialised according to LAU1 zip-codes and that has been basically not well represented in correspondence tables for NUTS3 ver. 2010 classification. Thus, NUTS3 ver. 2006 has been used as the most reliable EUROSTAT based data at the time.

Tab. 2.1. r-Spearman correlation test:
CE countries, PCR_PLIs, socio-economic variables

VARIABLE	PCR_PLI_HEA	PCR_PLI_HOU	PCR_PLI_SOC	PCR_PLI_WAT	PCR_PLI_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.161**	-0.251**	-0.051	-0.260**	-0.176**
POPCH_10_00 Population change (2010/2000)	-0.222**	-0.165**	-0.066	-0.142**	0.009
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.102*	-0.334**	-0.088*	-0.144**	0.024
DENS_08 Population density (2008)	0.385**	0.281**	0.388**	0.036	0.121**
OADR_08 Elderly to active ratio (2008)	0.056	0.314**	0.196**	-0.081	-0.170**
GDP_08 GDP per capita PPS (2008)	0.223**	0.317**	0.266**	-0.128**	0.114**
N	*623*	*291*	*563*	*527*	*655*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In the used data set concerning Central Europe all PCR_PLIs, but PCR_PLI_WAT, are significantly correlated with population density. Moreover numerous contextual and qualitative premises pinpoint that public service provision relies much upon the spatial characteristics of the territory. For this reason focused mapping and statistical tests have been done with reference to: predominantly urban regions, intermediate regions and predominantly rural regions, according to the classification provided by Eurostat.[109] For a more detailed overview see maps in annex X.

The r-Spearman correlation test for predominantly urban territories (tab. 2.2.) shows that again all PCR_PLIs are negatively correlated with POPCH_11_91 but in case of housing the correlation is not significant. In all cases but water and sewage PCR_PLIs are rather strongly,

[109] The typology is achieved throughout three main steps: 1. It creates clusters of urban grid cells with a minimum population density of 300 inhabitants per km² and a minimum population of 5 000. All the cells outside these urban clusters are considered as rural. 2. It groups NUTS 3 regions of less than 500 km² with one or more of its neighbours solely for classification purposes, i.e. all the NUTS 3 regions in a grouping are classified in the same way. 3. It classifies NUTS 3 regions based on the share of population in rural grid cells. More than 50 % of the total population in rural grid cells = predominantly rural, between 20 % and 50 % in rural grid cells = intermediate (6) and less than 20 % = predominantly urban. For details see: Urban-rural typology at EC Eurostat: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Urban-rural_typology

significantly and positively correlated with DENS_08. There are no significant correlations of PCR_PLIs with AVCBD_10_00 and OADR_08.

Tab. 2.2. r-Spearman correlation test:
CE countries - predominantly urban regions, PCR_PLIs, socio-economic variables

VARIABLE	PCR_PLI_HEA	PCR_PLI_HOU	PCR_PLI_SOC	PCR_PLI_WAT	PCR_PLI_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.382**	-0.092	-0.298**	-0.298*	-0.301**
POPCH_10_00 Population change (2010/2000)	-0.330**	0.142	-0.214*	-0.180*	-0.026
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.163	-0.073	-0.143	-0.151	0.019
DENS_08 Population density (2008)	0.545**	0.558**	0.360**	-0.003	0.426**
OADR_08 Elderly to active ratio (2008)	-0.039	0.068	0.099	-0.097	-0.150
GDP_08 GDP per capita PPS (2008)	0.249**	0.394**	0.228*	-0.175	0.374**
N	*134*	*81*	*120*	*125*	*140*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Also in case of intermediate territories (tab. 2.3.) all PCR_PLIs show negative relations to POPCH_11_91. Anyway, for this category the PCR_PLI_SOC is not significantly correlated. PCR_PLI_HOU is significantly correlated with all variables, while PCR_PLI_HEA is significantly correlated with all variables but OADR_08. AVCBD_10_00 shows significant negative correlation with all PCR_PLIs excluding the case of public transport.

Tab. 2.3. r-Spearman correlation test:
CE countries - intermediate regions, PCR_PLIs, socio-economic variables

VARIABLE	PCR_PLI_HEA	PCR_PLI_HOU	PCR_PLI_SOC	PCR_PLI_WAT	PCR_PLI_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.157**	-0.313**	-0.070	-0.302**	-0.187**
POPCH_10_00 Population change (2010/2000)	-0.232**	-0.253**	-0.103	-0.169**	-0.001
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.149*	-0.389**	-0.165**	-0.173**	-0.025
DENS_08 Population density (2008)	0.303**	0.268**	0.260**	0.078	0.114
OADR_08 Elderly to active ratio (2008)	0.035	0.306**	0.171**	0.028	-0.145*
GDP_08 GDP per capita PPS (2008)	0.200**	0.290**	0.249**	-0.057	0.137*
N	*280*	*141*	*262*	*233*	*288*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

For predominantly rural territories (tab. 2.4.) PCR_PLI in general show limited number of significant correlations. PCR_PLI_HOU is significantly correlated with all analysed variables but DENS_08. All PCR_PLIs except the case of health care are significantly correlated with OADR_08 and GDP_08. PCR_PLI_HEA, PCR_PLI_HOU and PCR_PLI_WAT show significant negative correlations with POPCH_11_91.

Tab. 2.4. r-Spearman correlation test:
CE countries - predominantly rural regions, PCR_PLIs, socio-economic variables

VARIABLE	PCR_PLI_HEA	PCR_PLI_HOU	PCR_PLI_SOC	PCR_PLI_WAT	PCR_PLI_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.140*	-0.467**	0.033	-0.213**	-0.122
POPCH_10_00 Population change (2010/2000)	-0.297**	-0.515**	-0.065	-0.104	-0.005
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.078	-0.521**	0.092	-0.131	0.064
DENS_08 Population density (2008)	0.211**	-0.077	0.188*	-0.142	-0.269**
OADR_08 Elderly to active ratio (2008)	0.080	0.443**	0.339**	-0.226*	-0.248**
GDP_08 GDP per capita PPS (2008)	0.026	0.237*	0.160*	-0.317**	-0.193**
N	*209*	*69*	*181*	*169*	*227*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.1.2. Local public service costs: regional typology across Central European countries

It has been already pinpointed here that public service cost comparison across the Central European countries should not be done in any kind of direct way. Throughout the whole chapters 2 and 3 the reader should not by any chance draw conclusions that lower PCR levels are better than higher or the other way. By our understanding the PCR proposed here is rather "neutral" in a meaning that it shows **certain comparable value** of service delivered to citizens. It means that NUTS3 regions can be described by a value of service sold in any of the investigated fields. It is not the price of the service but it shows sales of specific services per inhabitant of territory. While the efficiency issue is also conditioned by e.g.: organisational settings, legal schemes, spatial characteristics, technical standards and novelty. Taking them into consideration in qualitative studies allow much better picture and proper insight into the issues of public service economics.

Consequently one should be aware that the possible notion of best practices that can be easily transferred to the other territory may be totally misleading. In order to minimize the

risks of one-fit-all solutions a regional classification is proposed here. The core of the idea is to cluster similar regions and in this groups search for solutions; being enrooted in positive economy convey the findings into normative. The key methods used for clustering are Ward's general agglomerative hierarchical clustering procedure and k-means algorithm.[110] The clustering results for Central Europe and all analysed PCR_PLIs are presented in tab. 2.5.-2.9 and visualized on maps 2.6.-2.10. All clusters have been identified by joint computation of a specific PCR_PLI as well as POPCH_11_91 [Long term population change (2011/1991)], AVCBD_10_00 [Average rate of natural increase (2000-2010)], DENS_08 [Population density (2008)], OADR_08 [Elderly to active ratio (2008)], GDP_08 [GDP per capita PPS (2008)]. POPCH_10_00 [Population change (2010/2000)] was not used for clustering due to its small variability.

In case of health care DENS_08, OADR_08 and AVCBD_10_00 emerged as the main criteria to decide upon the grouping presented in table 2.5 and map 2.6.

[110] W pracy w celu wyodrębnienia grup obiektów podobnych pod względem badanych zmiennych zastosowano jedną z hierarchicznych metod grupowania, tj. metodę Warda (jest ona uznawana za skuteczną metodę grupowania obiektów, ale mającą tendencję do tworzenia skupień o małej wielkości) oraz metodę niehierarchiczną – metodę k-średnich (jako jedną z najczęściej wykorzystywaną w praktyce taksonomiczną metodą grupowania). Standaryzację zmiennych dokonano stosując metodę unitaryzacji zerowej. Ponadto w badaniach wykorzystano metodę średnich arytmetycznych – która odpowiada na pytanie, które z wybranych cech zdecydowały o wydzieleniu poszczególnych klas i jakie cechy są w poszczególnych klasach dominujące.

Tab. 2.5. Clusters of similar regions in Central Europe:

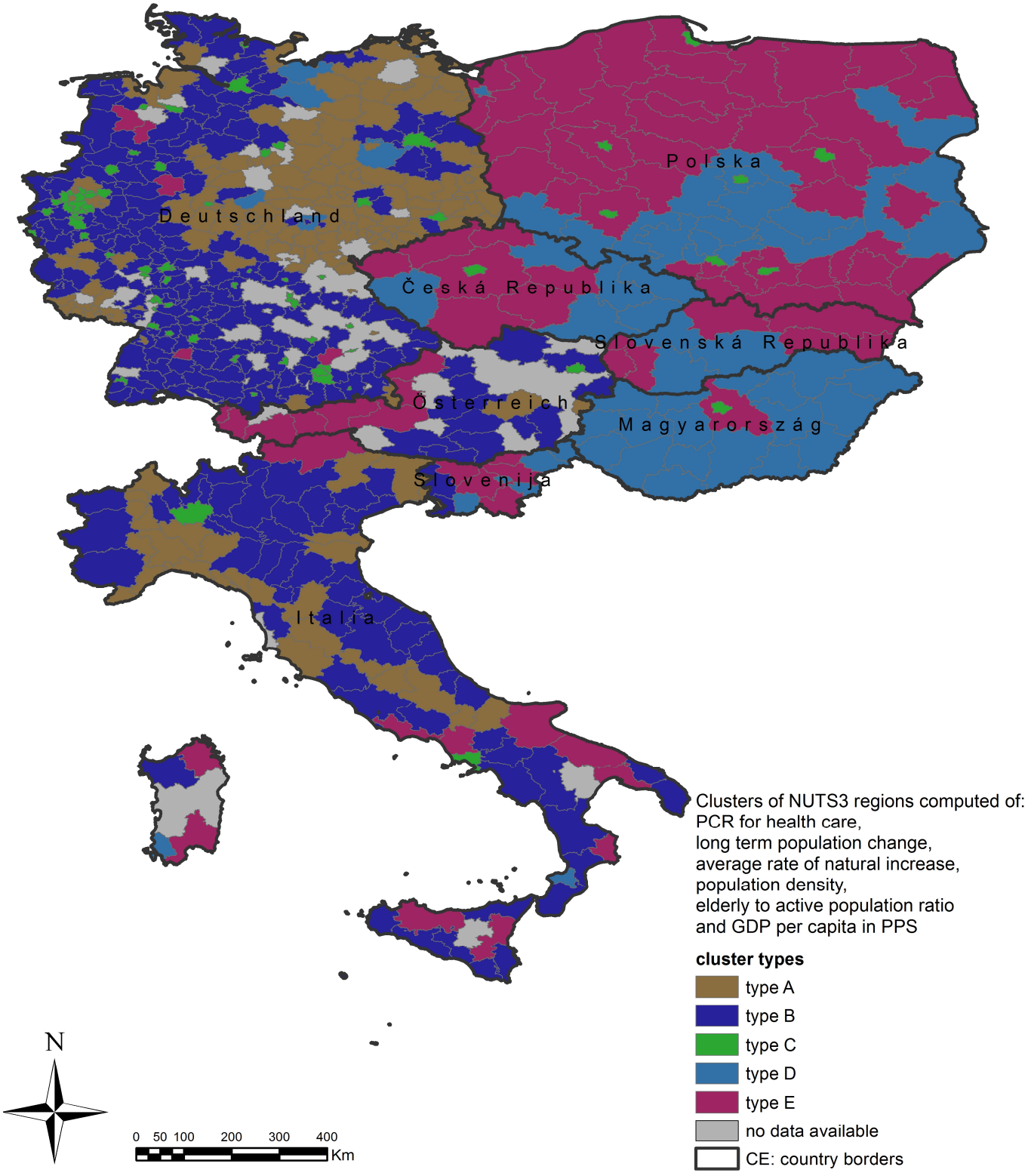
PCR_PLI_HEA, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
HEA_1 TYPE A	AT111; AT223; DE121; DE215; DE21D; DE223; DE233; DE249; DE24A; DE24C; DE24D; DE265; DE272; DE411; DE415; DE416; DE417; DE418; DE421; DE422; DE425; DE427; DE429; DE502; DE725; DE733; DE734; DE735; DE736; DE737; DE802; DE803; DE804; DE806; DE809; DE80B; DE80C; DE80D; DE80F; DE80G; DE80H; DE80I; DE912; DE918; DE91B; DE923; DE925; DE926;; DE928; DE932; DE93A; DE945; DE94A; DE94G; DEA31; DEA36; DEA53; DEA56; DEB12; DEB15; DEB16; DEB1A; DEB24; DEB36; DEB37; DEB3A; DEB3G; DEB3K; DEC01; DEC02; DEC03; DEC04; DEC05; DED11; DED13; DED14; DED15; DED16; DED18; DED19; DED1A; DED1B; DED1C; DED22; DED23; DED24; DED25; DED26; DED27; DED28; DED29; DED2A; DED2B; DED34; DED35; DED36; DEE01; DEE02; DEE03; DEE04; DEE05; DEE06; DEE07; DEE08; DEE09; DEE0A; DEE0B; DEE0C; DEE0D; DEE0E; DEF03; DEF04; DEF05; DEF08; DEG02; DEG04; DEG07; DEG09; DEG0A; DEG0B; DEG0C; DEG0E; DEG0F; DEG0H; DEG0I; DEG0J; DEG0K; DEG0L; DEG0M; DEG0N; DEG0P; ITC12; ITC13; ITC14; ITC17; ITC18;ITC31; ITC32; ITC33; ITC34; ITC48; ITD33; ITD37; ITD42; ITD43; ITD44; ITD51; ITD56; ITE11; ITE12; ITE14; ITE19; ITE1A; ITE22; ITE42; ITF11; ITF21; ITF22	Spatial characteristics: - 19 predominantly urban regions, - 77 intermediate regions, - 62 predominantly rural regions. Statistical characteristics: clustered territories present OADR_08 much higher than average and low values of AVCBD_10_00 and POPCH_11_91.
HEA_2 TYPE B	AT112; AT124; AT126; AT211; AT212; AT213; AT221; AT222; AT224; AT226; AT312; AT314; DE112; DE113; DE114; DE115; DE116; DE118; DE119; DE11A; DE11B; DE11C; DE123; DE124; DE127; DE128; DE12A; DE12B; DE12C DE132; DE134; DE135; DE136; DE137; DE138 DE139; DE13A; DE141; DE143; DE145; DE146 DE147; DE148; DE149; DE214; DE216; DE217; DE218; DE21C; DE21E; DE21F; DE21G; DE21I; DE21J; DE21K; DE21L; DE21M; DE21N; DE225; DE226; DE228; DE229; DE22A; DE22C; DE234; DE235; DE239; DE245; DE248; DE255; DE256; DE259; DE25B; DE266; DE267; DE269; DE26A; DE26B DE26C; DE276; DE277; DE279; DE27A; DE27B; DE27C; DE27D; DE27E; DE412; DE413; DE414; DE423; DE424; DE426; DE428; DE42A; DE715; DE716; DE717; DE718; DE719; DE71A; DE71B; DE71C; DE71D; DE71E; DE721; DE722; DE723; DE724; DE732; DE807; DE914; DE915; DE922; DE927; DE929; DE931; DE933; DE935; DE937; DE938; DE939; DE93B; DE941; DE942; DE946; DE947; DE949; DE94B; DE94C; DE94E; DE94H; DEA1B; DEA1D; DEA1E; DEA1F; DEA25; DEA26; DEA27; DEA28; DEA29; DEA2A; DEA2B; DEA2C; DEA34; DEA35; DEA37; DEA38; DEA42; DEA43; DEA44; DEA45; DEA46; DEA54; DEA57; DEA58; DEA59; DEA5A; DEA5B; DEA5C; DEB13; DEB14; DEB17; DEB18; DEB19; DEB1B; DEB21; DEB22; DEB23; DEB25; DEB32; DEB33; DEB39; DEB3B; DEB3C; DEB3H; DED2A; DED32; DED35; DEF06; DEF07; DEF09; DEF0A; DEF0B; DEF0C; DEF0D; DEF0F; DEG01; DEG03; DEG05; ITC11; ITC15; ITC16; ITC20; ITC41; ITC42; ITC43; ITC44; ITC46; ITC47; ITC49; ITC4A; ITC4B; ITD20; ITD31; ITD32 ITD34; ITD35; ITD36; ITD41; ITD52; ITD53; ITD54; ITD55; ITD57; ITD58; ITD59; ITE13; ITE15; ITE17; ITE18; ITE21; ITE31; ITE32; ITE33; ITE34; ITE41; ITE43; ITE45; ITF12; ITF13; ITF14; ITF32; ITF34; ITF35; ITF44; ITF45;	Spatial characteristics: - 46 predominantly urban regions, - 131 intermediate regions, - 72 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of POPCH_11_91.

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
	ITF51; ITF61; ITF63; ITF65; ITG11; ITG13; ITG14; ITG15; ITG18; ITG19; ITG25; SI023; SI024	
HEA_3 TYPE C	AT130; CZ010; DE111; DE117; DE122; DE125; DE126; DE129; DE131; DE144; DE211; DE212; DE213; DE21H; DE221; DE232; DE241; DE242; DE252; DE253; DE254; DE262; DE263; DE271; DE273; DE300; DE501; DE600; DE711; DE712; DE713; DE714; DE731; DE801 DE911; DE913; DE943; DE944; DEA11; DEA12; DEA13; DEA14; DEA15; DEA17; DEA18; DEA19; DEA1A; DEA1C; DEA21; DEA22; DEA23; DEA24; DEA32; DEA33; DEA41; DEA51; DEA52; DEA55; DEB11; DEB34; DEB35; DEB38; DED21; DED31; DEF01; DEF02; HU101; ITC45; ITF33; PL113; PL127; PL213; PL22A; PL415; PL514; PL633	Spatial characteristics: - 52 predominantly urban regions, - 21 intermediate regions, - 3 predominantly rural regions. Statistical characteristics: clustered territories present the highest PCR_PLI_HEA, DENS_08 (much above the average) and high GDP_08 values.
HEA_4 TYPE D	CZ032; CZ052; CZ064; CZ071; CZ072; CZ080; DE428; DE801; DE80A; DE80E; DEG06; DEG0G; HU211; HU212; HU213; HU221; HU222; HU223; HU231; HU232; HU233; HU311; HU312; HU313; HU321; HU322; HU323; HU331; HU332; HU333; ITF64; ITG2C; PL114; PL115; PL116; PL117; PL224; PL228; PL229; PL22B; PL311; PL312; PL315; PL331; PL332; PL344; PL424; PL515; PL517; PL521; PL522; SI011; SI012; SI015; SI016; SI018; SK022; SK023; SK032	Spatial characteristics: - 4 predominantly urban regions, - 19 intermediate regions, - 36 predominantly rural regions. Statistical characteristics: clustered territories present the lowest PCR_PLI_HEA and.GDP_08 and AVCBD_10_00 values.
HEA_5 TYPE E	AT311; AT322; AT323; AT332; AT334; AT335; AT341; AT342; CZ020; CZ031; CZ041; CZ042; CZ051; CZ053; CZ063; DE142; DE21B; DE948; DE94F; DEA47; HU102ITD10; ITE44; ITF31; ITF41; ITF42; ITF43; ITF62; ITG12; ITG17; ITG27; ITG27; ITG29; PL121; PL122; PL128; PL129; PL12A; PL214; PL215; PL216; PL217; PL225; PL227; PL22C; PL314; PL315; PL323; PL324; PL325; PL326; PL331; PL332; PL343; PL345; PL411; PL414; PL416; PL417; PL418; PL422; PL423; PL425; PL431; PL432; PL516; PL518; PL613; PL614; PL615; PL621; PL622; PL623; PL631; PL634; PL635; SI013; SI014; SI017; SI021; SI022; SK010; SK021; SK031; SK041; SK042	Spatial characteristics: - 13 predominantly urban regions, - 32 intermediate regions, - 37 predominantly rural regions. Statistical characteristics: clustered territories present the lowest values of OADR_08 and DENS_08 as well as the highest AVCBD_10_00.

Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map 2.6. Clusters of similar regions in Central Europe:
PCR_PLI_HEA, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In case of heath care sector, we can observe clear division of Central European countries on group in which clusters type E and D are dominant, and group with clusters type A and B. The first group consists of Poland, Slovakia, Czech Republic and Hungary. The second group consist of Germany, Italy. However in this counties there are some regions of different types. Austria and Slovenia are most diverse countries taking into account clusters types.

In case of housing OADR_08 and AVCBD_10_00 emerged as the main criteria to decide upon the grouping presented in table 2.6. and map 2.7.

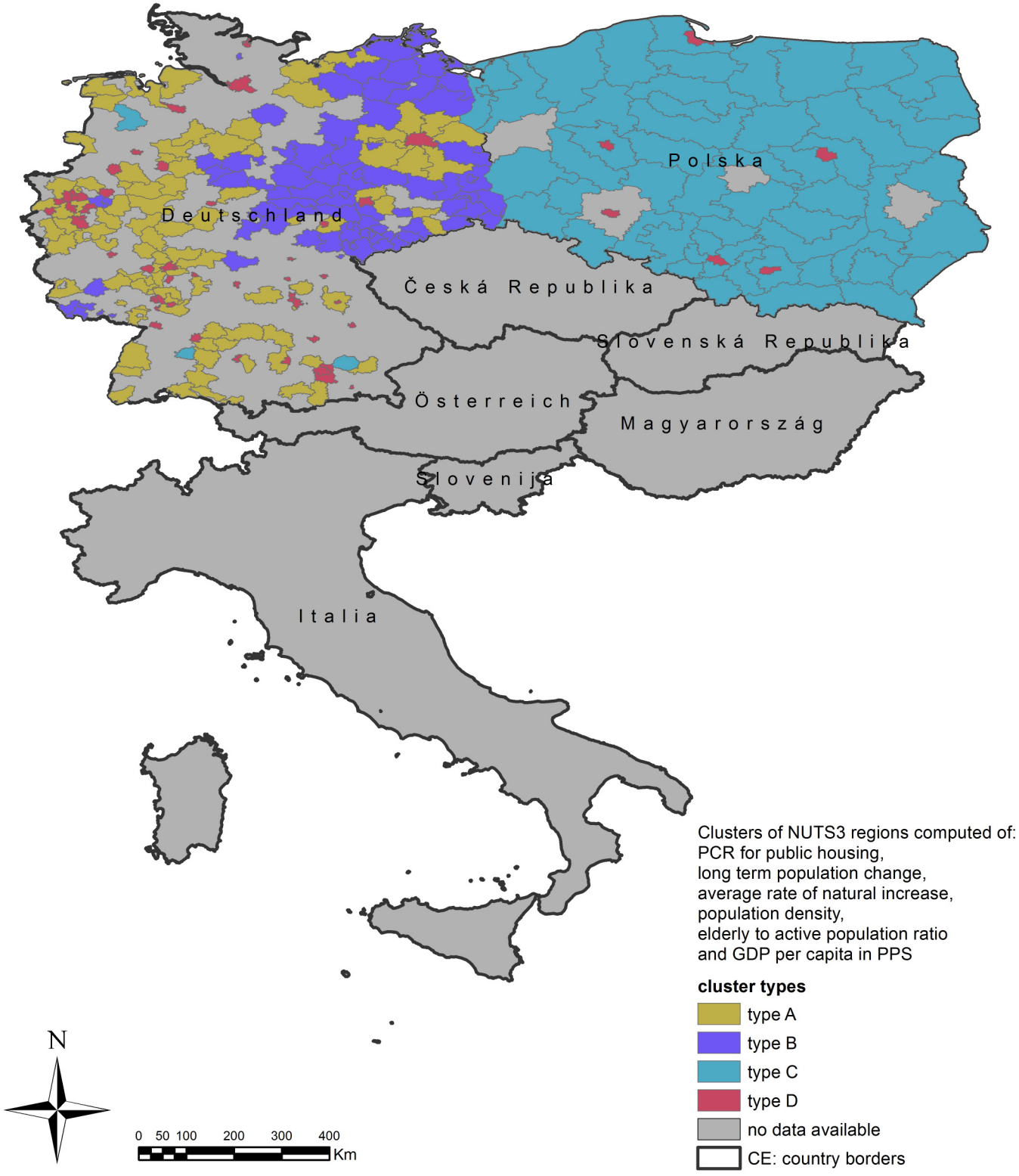
Tab. 2.6. Clusters of similar regions in Central Europe: PCR_PLI_HOU, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
HOU_1 TYPE A	DE113; DE114; DE116; DE11D; DE128; DE133; DE134; DE138; DE139; DE141; DE147; DE149; DE216; DE217; DE21G; DE21N; DE234; DE248; DE255; DE25A; DE269; DE276; DE279; DE27A; DE27D; DE412; DE413; DE414; DE423; DE424; DE426; DE428; DE42A; DE715; DE717; DE719; DE71A; DE71C; DE71E; DE722; DE723; DE724; DE735; DE807; DE80A; DE80E; DE915; DE91A; DE927; DE929; DE931; DE932; DE942; DE947; DE94A; DE94G; DE94B; DE94C; DEA1C; DEA1D; DEA1E; DEA1F; DEA26; DEA27; DEA28; DEA2A; DEA2C; DEA31; DEA36; DEA38; DEA43; DEA45; DEA46; DEA47; DEA54; DEA57; DEA58; DEA5A; DEA5B; DEB14; DEB18; DEB25; DEB32; DEB36; DEB39; DEB3B; DEB3H; DEB3J	Spatial characteristics: - 28 predominantly urban regions, - 55 intermediate regions, - 12 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of POPCH_11_91 and values of PCR_PLI_HOU, DENS_08 above the average.
HOU_2 TYPE B	DE244; DE265; DE411; DE415; DE416; DE418; DE421; DE422; DE425; DE427; DE429; DE803; DE804; DE808; DE809; DE80B; DE80C; DE80D; DE80F; DE80G; DE80H; DE80I; DE912; DE917; DE918; DE919; DE923; DE925; DE926; DE93A; DEA53; DEA56; DEB15; DEB37; DEB3A; DEC01; DEC03; DEC04; DED12; DED13; DED14; DED15; DED16; DED17; DED18; DED1A; DED1B; DED1C; DED22; DED23; DED24; DED26 DED28; DED29; DED2B; DED33 DED34; DEE01; DEE02; DEE03; DEE05; DEE06; DEE07; DEE08; DEE09; DEE0A; DEE0B; DEE0C; DEE0D; DEE0E; DEF04; DEG02; DEG07; DEG09; DEG0A; DEG0C; DEG0D; DEG0I; DEG0K; DEG0L; DEG0M; DEG0P	Spatial characteristics: - 7 predominantly urban regions, - 49 intermediate regions, - 26 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of OADR_08 and the lowest values of POPCH_11_91 and AVCBD_10_00.
HOU_3 TYPE C	DE142; DE21A; DE948; PL115; PL116; PL117; PL121; PL122; PL128; PL129; PL12A; PL214; PL215; PL216; PL217; PL224; PL225; PL227; PL228; PL229; PL22B; PL22C; PL311; PL312; PL315; PL323; PL324; PL325; PL326; PL331; PL332; PL343; PL344; PL345; PL411; PL414; PL416; PL417; PL418; PL422; PL423; PL424; PL425; PL432; PL515; PL516; PL517; PL521; PL522; PL613; PL614; PL615; PL621; PL622; PL623; PL631; PL634; PL635 - skupienie to tworzą: 8 obiekty	Spatial characteristics: - 8 predominantly urban regions, - 20 intermediate regions, - 30 predominantly rural regions.

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
	miejskie; 20 wiejsko-miejskie; 30 wiejskie	Statistical characteristics: clustered territories present the lowest values of: PCR_PLI_HOU, GDP_08, OADR_08, DENS_08 as well as the highest AVCBD_10_00.
HOU_4 TYPE D	DE111; DE122; DE125; DE126; DE144; DE211; DE212; DE213; DE21H; DE231; DE232; DE241; DE242; DE243; DE252; DE253; DE254; DE261; DE263; DE271; DE300; DE501; DE600; DE711; DE712; DE713; DE714; DE731; DE944; DEA11; DEA12; DEA13; DEA14; DEA15; DEA16; DEA17; DEA19; DEA1A; DEA23; DEA24; DEA33; DEA41; DEA52; DEB11; DEB31; DEB34; DEB38; DED31; DEF02; DEG03; PL127; PL213; PL22A; PL415; PL514; PL633	Spatial characteristics: - 38 predominantly urban regions, - 17 intermediate regions, - 1 predominantly rural region. Statistical characteristics: clustered territories present the highest values of: PCR_PLI_HOU, GDP_08 and DENS_08.

Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map 2.7. Clusters of similar regions in Central Europe:
PCR_PLI_HOU, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Taking into account clusters regions according to housing services variables, we can observed some spatial regularities. In Poland clusters of type C dominate, accept some large urban areas. Eastern part of Germany mainly represents clusters of type B, however Berlin and surrounding regions are different type. Western part of Germany are pretty diverse.

In case of social care AVCBD_10_00. OADR_08 and POPCH_11_91 emerged as the main criteria to decide upon the grouping presented in table 2.7. and map 2.8.

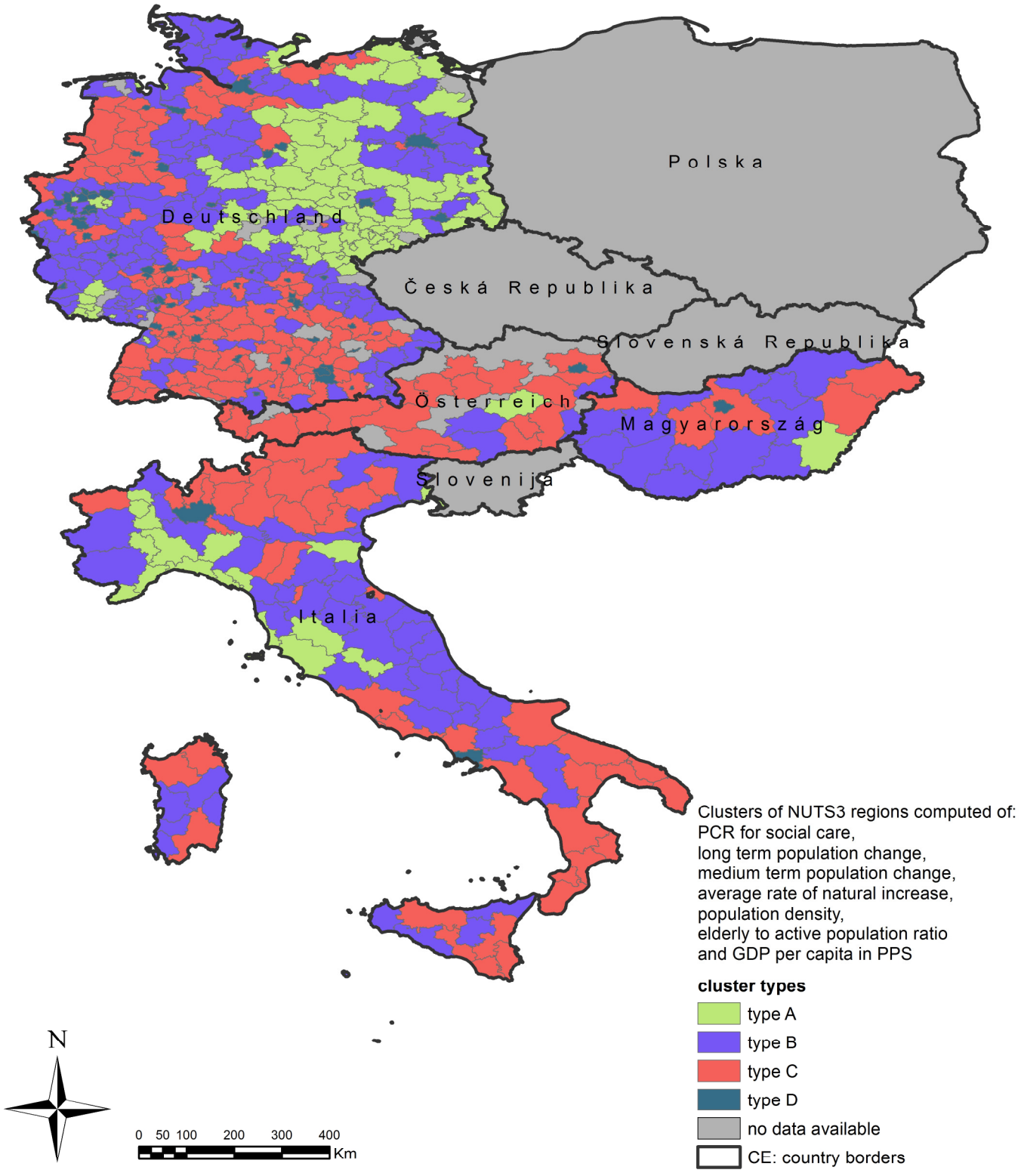
Tab. 2.7. Clusters of similar regions in Central Europe:
PCR_PLI_SOC, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
SOC_1 TYPE A	AT223; DE121; DE243; DE244; DE249; DE24A; DE24D; DE411; DE416; DE417; DE418; DE421; DE425; DE427; DE429; DE501; DE502; DE725; DE733; DE737; DE804; DE805; DE806; DE808; DE809; DE80D; DE80F; DE912; DE916; DE917; DE918; DE919; DE923; DE926; DE934; DE93A; DE945; DEA16; DEA53; DEA56; DEB15; DEB37; DEC01; DEC03; DEC05; DEC06; DED11; DED12; DED13; DED14; DED15; DED16; DED17; DED19; DED1A; DED1B; DED1C; DED22; DED23; DED24; DED26; DED27; DED28; DED29; DED33; DED34; DED36; DEE01; DEE02; DEE03; DEE04; DEE05; DEE06; DEE07; DEE08; DEE09; DEE0A; DEE0B; DEE0C; DEE0D; DEE0E; DEF03; DEF08; DEG02; DEG04; DEG07; DEG09; DEG0A; DEG0B; DEG0F; DEG0H; DEG0I; DEG0K; DEG0L; DEG0M; DEG0N; HU332; ITC12; ITC13; ITC17; ITC18; ITC31; ITC32; ITC33; ITC34; ITD43; ITD44; ITD51; ITD56; ITE11; ITE16; ITE19; ITE1A; ITE22	Spatial characteristics: - 14 predominantly urban regions, - 58 intermediate regions, - 41 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of: OADR_08 and the lowest values of AVCBD_10_00 and POPCH_11_91.
SOC_2 TYPE B	AT112; AT113; AT213; AT226; DE114; DE11B; DE11C; DE124; DE127; DE135; DE136; DE143; DE214; DE215; DE21D; DE21F; DE21G; DE21M; DE223; DE225; DE228; DE22A; DE233; DE234; DE235; DE237; DE239; DE246; DE247; DE24B; DE24C; DE251; DE259; DE25A; DE25C; DE265; DE266; DE267; DE268; DE26A; DE26B; DE272; DE27A; DE27E; DE412; DE413; DE414; DE415; DE422; DE424; DE426; DE428; DE42A; DE715; DE718; DE719; DE71B; DE71D; DE722; DE723; DE734; DE735; DE736; DE801; DE802; DE803; DE80A; DE80B; DE80C; DE80G; DE915; DE91A; DE91B; DE922; DE925; DE927; DE928; DE929; DE931; DE932; DE936; DE938; DE941; DE942; DE947; DE94A; DE94G; DEA1C; DEA1D; DEA1E; DEA1F; DEA25; DEA26; DEA28; DEA2A; DEA2B; DEA31; DEA36; DEA43 DEA44; DEA45; DEA46; DEA54; DEA57; DEA58; DEA5A; DEA5B; DEA5C; DEB12; DEB13; DEB14; DEB16; DEB17; DEB18; DEB19; DEB1A; DEB1B; DEB22; DEB23; DEB24; DEB25; DEB31; DEB32; DEB39; DEB3C; DEB3D; DEB3F; DEB3H; DEB3I; DEB3K; DEC02; DEC04; DED25; DED2A; DED2B; DED32; DED35; DEF04; DEF05; DEF06; DEF07; DEF09; DEF0A; DEF0B; DEF0C; DEF0E; DEF0F; DEG01; DEG05; DEG06; DEG0C; DEG0D; DEG0E; DEG0J; HU212; HU213; HU222; HU223; HU231; HU232; HU233; HU311; HU312; HU313; HU322; HU331; HU333; ITC11; ITC14; ITC15; ITC16; ITC48; ITC4A; ITC4B; ITD33; ITD35;	Spatial characteristics: - 31 predominantly urban regions, - 96 intermediate regions, - 86 predominantly rural regions. Statistical characteristics: clustered territories present the lowest values of: PCR_PLI_SOC, and GDP_08; the other variables are close to the average.

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
	ITD37; ITD42; ITD52; ITD55; ITD57; ITD58; ITE12; ITE13; ITE14; ITE17; ITE18; ITE21; ITE31; ITE32; ITE33; ITE34; ITE41; ITE42; ITE45; ITF11; ITF12; ITF13; ITF14; ITF21; ITF22; ITF32; ITF34; ITF51; ITG11; ITG13; ITG14; ITG16; ITG26; ITG28; ITG2A; ITG2B; ITG2C	
SOC_3 TYPE C	AT121; AT122; AT126; AT127; AT211; AT212; AT221; AT224; AT225; AT312; AT314; AT315; AT322; AT323; AT332; AT334; AT335; AT341; AT342; DE112; DE113; DE115; DE116; DE118; DE119; DE11A; DE11D; DE123; DE128; DE12A; DE12B; DE12C; DE131; DE132; DE133; DE134; DE137; DE138; DE139; DE13A; DE141; DE142; DE145; DE146; DE147; DE148; DE149; DE216; DE217; DE218; DE21A; DE21B; DE21C; DE21E; DE21I; DE21J; DE21K; DE21L; DE21N; DE224; DE226; DE22B; DE22C; DE236; DE238; DE245; DE248; DE256; DE257; DE258; DE25B; DE264;DE26C; DE275; DE276; DE277; DE279; DE27B; DE27C; DE27D; DE423; DE716; DE717; DE71A; DE71C; DE71E; DE721; DE724; DE732; DE807; DE80E; DE914; DE933; DE935; DE937; DE939; DE93B; DE946; DE948; DE949; DE94B; DE94C; DE94D; DE94E; DE94F; DEA1B; DEA27; DEA29; DEA2C; DEA33; DEA34; DEA35; DEA37; DEA38; DEA42; DEA47; DEA59; DEB3J; DEF0D; DEG03; HU102; HU211; HU221; HU321; HU323; ITC20; ITC41; ITC42; ITC43; ITC44; ITC46; ITC47; ITC49; ITD10; ITD20; ITD31; ITD32; ITD34; ITD36; ITD41; ITD53; ITD54; ITD59; ITE15; ITE43; ITE44; ITF31; ITF35; ITF41; ITF42; ITF43; ITF44; ITF45; ITF52; ITF61; ITF62; ITF63; ITF64; ITF65; ITG12; ITG15; ITG17; ITG18; ITG19; ITG25; ITG27; ITG29	Spatial characteristics: - 31 predominantly urban regions, - 88 intermediate regions, - 50 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of: AVCBD_10_00 and POPCH_11_91 and the lowest values of OADR_08.
SOC_4 TYPE D	AT130; DE111; DE117; DE122; DE125; DE126; DE129; DE144; DE211; DE212; DE213; DE21H; DE221; DE222; DE232; DE241; DE242; DE252; DE253; DE254; DE261; DE262; DE263; DE271; DE273; DE274; DE300; DE501; DE600; DE711; DE712; DE713; DE714; DE731; DE911; DE913; DE943; DE944; DEA11; DEA12; DEA13 DEA14; DEA15; DEA17; DEA18; DEA19; DEA1A; DEA21; DEA22; DEA23; DEA24; DEA32; DEA41; DEA51; DEA52; DEA55 DEB11; DEB21; DEB34; DEB35; DEB38; DED21; DED31; DEF01; DEF02; HU101; ITC45; ITF33	Spatial characteristics: - 44 predominantly urban regions, - 20 intermediate regions, - 3 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of: PCR_PLI_SOC, GDP_08 and DENS_08.

Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map 2.8. Clusters of similar regions in Central Europe:
PCR_PLI_SOC, POPCH_11_91, AVCBD_10_00, DENS_08, OADR_08, GDP_08



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In case of social services we can observe large difference of clusters types in each Central European countries. Type C dominate in north part of Italy, south Germany and western Austria, while central Italy and south Hungary are regions type B.

In case of water and sewage OADR_08 emerged as the main criterion to decide upon the grouping presented in table 2.8. and map 2.9.

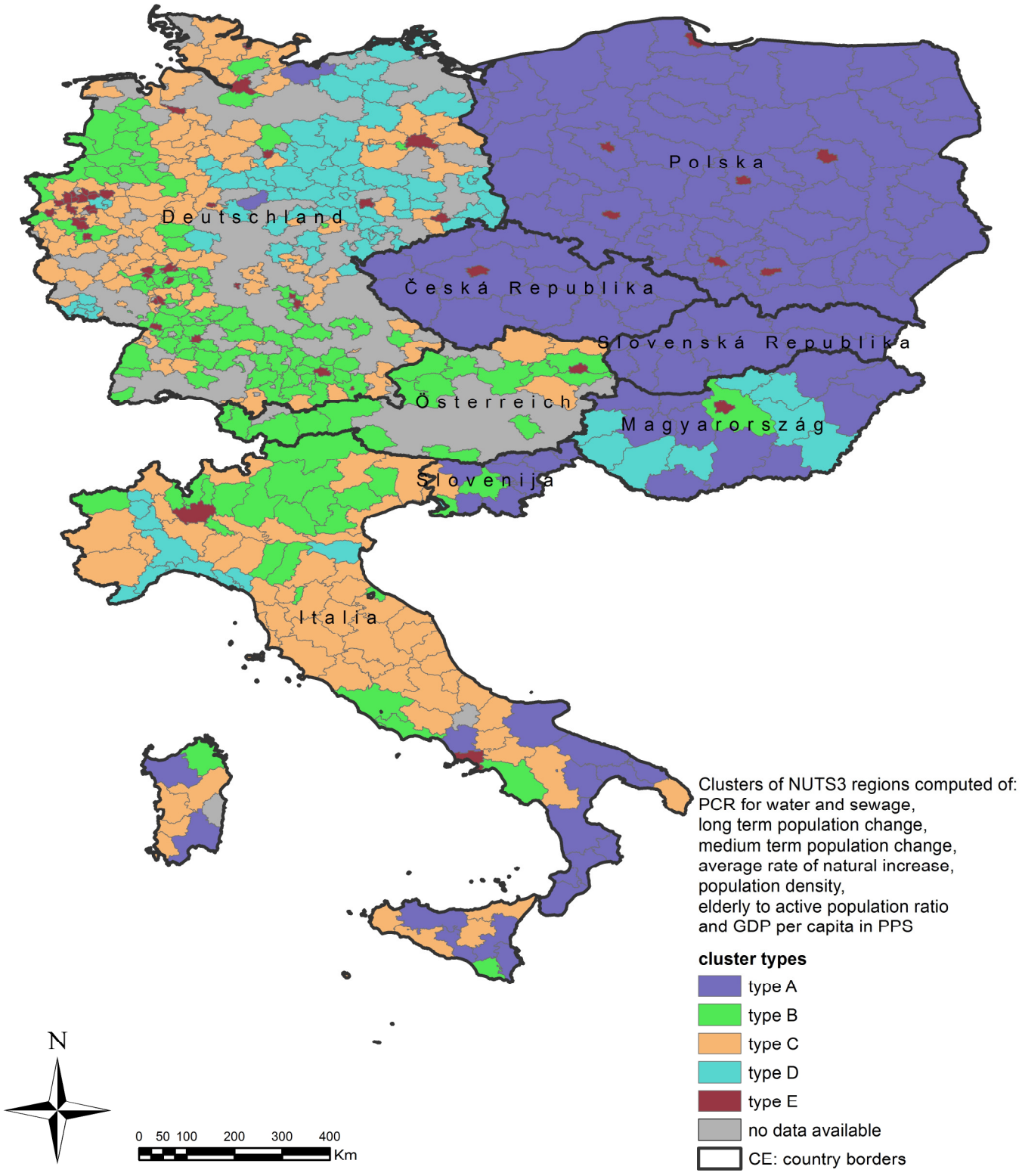
Tab. 2.8. Clusters of similar regions in Central Europe: PCR_PLI_WAT, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
WAT_1 TYPE A	CZ020 ;CZ031 ;CZ032 ;CZ041 ;CZ042 ;CZ051 ;CZ052 ;CZ053 ;CZ063 ;CZ064 ;CZ071 ;CZ072 ;CZ080 ;DE801; DE80E; DEG06; HU211 ;HU212 ;HU213 ;HU221 ;HU311 ;HU321 ;HU323 ;HU331; HU333; ITF31 ;ITF41 ;ITF42 ;ITF43 ;ITF44; ITF52; ITF61; ITF62 ; ITF63; ITF64 ; ITF65; ITG12 ; ITG15; ITG17 ;ITG19 ; ITG25; ITG27 ;PL114 ;PL115 ;PL116 ;PL117 ;PL121 ;PL122 ;PL128 ;PL129 ;PL12A ;PL214 ;PL215 ;PL216 ;PL217 ;PL224 ;PL225 ;PL227 ;PL228 ;PL229 ;PL22B ;PL22C ;PL311 ;PL312 ;PL314 ;PL315 ;PL323 ;PL324 ;PL325 ;PL326 ;PL331 ;PL332 ;PL343 ;PL344 ;PL345 ;PL411 ;PL414 ;PL416 ;PL417 ;PL418 ;PL422 ;PL423 ;PL424 ;PL425 ;PL431 ;PL432 ;PL515 ;PL516 ;PL517 ;PL518 ;PL521 ;PL522 ;PL613 ;PL614 ;PL615 ;PL621 ;PL622 ;PL623 ;PL631 ;PL634 ;PL635 ;SI011 ;SI012 ;SI013 ;SI014 ;SI015 ;SI016 ;SI017 ;SI018 ;SI022 ;SK010; SK021 ;SK022 ;SK023 ;SK031 ;SK032 ;SK041 ;SK042	Spatial characteristics: - 14 predominantly urban regions, - 46 intermediate regions, - 59 predominantly rural regions. Statistical characteristics: clustered territories present the lowest values of: GDP_08, OADR_08 and DENS_08.
WAT_2 TYPE B	AT121 ; AT123 ;AT126 ;AT127 ;AT211 ;AT221 ;AT311 ;AT312 ;AT315 ;AT323 ;AT332 ;AT333 AT334 ; AT335 ;AT341 ;AT342 ; DE112 ;DE113 ;DE115 ;DE118 ;DE119 ;DE11A ; DE11D ;DE123 ; DE128 ;DE12A ;DE12B ;DE133 ;DE134 ; DE139 ;DE141 ;DE142 ;DE145 ;DE149 ; DE216 ;DE217 ;DE218 ;DE219 ;DE21A ;DE21B ;DE21C ;DE21E ; DE21H ;DE21K ;DE21L ; DE21N ;DE224 ;DE238 ;DE257 ;DE258 ; DE25B ;DE264 ; DE269 ; DE275 ;DE276 ;DE278 ; DE27B ;DE27C ;DE27D ; DE423 ; DE716 ;DE717 ; DE71A ;DE71C DE721 ; DE724 ; DE914 ; DE933 ; DE946 ; DE948 ;DE949 ;DE94B ;DE94E ;DE94F ; DEA27 ; DEA29 ; DEA2C ;DEA33 ;DEA34 ;DEA35 ;DEA37 ;DEA38 ;DEA42 ; DEA47 ; DEB33 ; DEB3B ;DEB3E ; DEB3J ; DEF0D ;DEG03 ;HU102; ITC20 ;ITC41 ;ITC42 ;ITC43 ; ITC46 ;ITC47 ;ITC49 ; ITD10 ;ITD20 ;ITD31 ;ITD32 ;ITD34 ; ITD36 ;ITD41 ; ITD53 ;ITD54 ; ITD59 ; ITE15 ; ITE43 ;ITE44 ; ITF35 ; ITG18 ; ITG29 ;SI021 ; SI024	Spatial characteristics: - 29 predominantly urban regions, - 63 intermediate regions, - 25 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of AVCBD_10_00 and POPCH_11_91 as well as the lowest PCR_PLI_WAT..
WAT_3 TYPEC	AT122; AT124 ;AT125 ;DE11C; DE124; DE127; DE135; DE143; DE214; DE21D ;DE21F; DE21M; DE221; DE228; DE229 ; DE246 ;DE247 ; DE24C ; DE259; DE268; DE26B; DE27A; DE27E; DE412; DE413; DE414; DE424; DE426 ; DE428 ; DE715; DE718; DE719; DE71B ; DE71D; DE71E; DE722; DE723 ;DE734 ;DE736 ; DE91B ;DE922; DE927 ;DE928 ;DE929; DE931 ;DE932 ; DE93B; DE947; DE94G ;DEA1C ;DEA1D; DEA1E DEA1F; DEA25; DEA26; DEA28; DEA2A; DEA2B; DEA36 ;DEA43 ;DEA45 ;DEA46 ;DEA57 ;DEA58 ;DEA5A ;DEA5B; DEB11 ;DEB12 ;DEB13 ;DEB14 ;DEB18; DEB1A ;DEB22 ;DEB23 ;DEB32 ;DEB39; DEB3A	Spatial characteristics: - 26 predominantly urban regions, - 76 intermediate regions, - 50 predominantly rural regions. Statistical characteristics: clustered territories present the

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
	;DEB3I ;DEC02 ; DED25 ; DED2A ; DED35 ; DEF03 ;DEF04 ;DEF05 ;DEF06; DEF08 ; DEF09; DEF0A; DEF0B; DEF0C; DEF0E ;DEG01 ; DEG0J ; HU232 ; ITC11;ITC14 ; ITC15; ITC16; ITC17 ;ITC44; ITC4A; ITC4B; ITC48 ;ITD33 ;ITD35; ITD37 ;ITD42 ;ITD43 ; ITD51 ;ITD52; ITD55 ; ITD57 ;ITD58; ITE12 ;ITE13; ITE14 ;ITE16 ;ITE17; ITE18; ITE19 ;ITE1A ;ITE21; ITE22 ;ITE31; ITE32; ITE33; ITE34; ITE42 ;ITE45; ITF11 ;ITF12; ITF13; ITF14 ;ITF22 ;ITF32 ;ITF34; ITF45; ITF51 ;ITG11; ITG13; ITG14; ITG16 ;ITG26; ITG28 ;ITG2B ;ITG2C; SI023	AVCBD_10_00 much below average and all other variables on average level.
WAT_4 TYPE D	DE243 ;DE24A ;DE24D ;DE411 ;DE416 ;DE418 ;DE421 ;DE422 ;DE425 ;DE429 ;DE725 ;DE737 ;DE802 ;DE803 ;DE804 ;DE805 ;DE809 ;DE80C ;DE80D ;DE80G ;DE80H ;DE912 ;DE916 ;DE917 ;DE918 ;DE919 ;DE923 ;DE926 ;DEA53;DEA56 ;DEC01 ;DEC03 ;DEC04 ;DEC05 ;DEC06 DED11 ;DED13 ;DED14 ;DED15 ;DED17 ;DED1C ;DED22 ;DED24 ;DED26 ;DED27 ;DED28 ;DED29 ;DED33 ;DED34 ;DED36 ;DEE01 ;DEE02 ;DEE03 ;DEE04 ;DEE05 ;DEE06 ;DEE07 ;DEE08 ;DEE09 ;DEE0A ;DEE0B ;DEE0C ;DEE0D ;DEE0E ;DEG02 ;DEG07 ;DEG0C; DEG0D ;DEG0E ;DEG0I ;DEG0M; HU222 ;HU223 ;HU232 ;HU233 ;HU312 ;HU313 ;HU322 ;HU332; ITC12 ;ITC13 ;ITC18 ;ITC31 ;ITC32 ;ITC33 ;ITC34 ;ITD44; ITD56 ; ITE11	Spatial characteristics: - 12 predominantly urban regions, - 42 intermediate regions, - 35 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of OADR_08 as well as the lowest values of AVCBD_10_00 and POPCH_11_91.
WAT_5 TYPE E	AT130 ;CZ010 ;DE111 ;DE122 ;DE126 ;DE212 ;DE213 ;DE252 ; DE254 ;DE263 ;DE300 ;DE501 ;DE600 ;DE711 ;DE712 ;DE713 ; DE714 ;DE731 ; DE911 ;DEA11 ;DEA12 ;DEA13 ;DEA14 ; DEA15 ;DEA16 ;DEA17 ;DEA18 ;DEA1A ;DEA22 ;DEA23 ;DEA24; DEA32 ;DEA51 ;DEA52 ;DEA55 ; DEB34 ;DEB35 ;DED21 ; DED31 ;DEF02 ;HU101 ;ITC45 ;ITF33 ;PL113 ;PL127 ;PL213 ; PL22A ;PL415 ;PL514 ;PL633	Spatial characteristics: - 44 predominantly urban regions, - 6 intermediate regions. Statistical characteristics: clustered territories present the highest values of: PCR_PLI_WAT, GDP_08 and DENS_08.

Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map 2.9. Clusters of similar regions in Central Europe:
PCR_PLI_WAT, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In case of water services, regions in Poland, Czech Republic and Slovakia are the same type A, accept large urban areas with type E. The rest of Central European countries are very diverse, however we can observe some "islands" of similar clusters types. For example in Hungary, eastern Germany or Italy, where different types dominate in north-west (type E), central (type C) and south (type A).

In case of public transport DENS_08, OADR_08 and AVCBD_10_00 emerged as the main criteria to decide upon the grouping presented in table 2.9. and map 2.10.

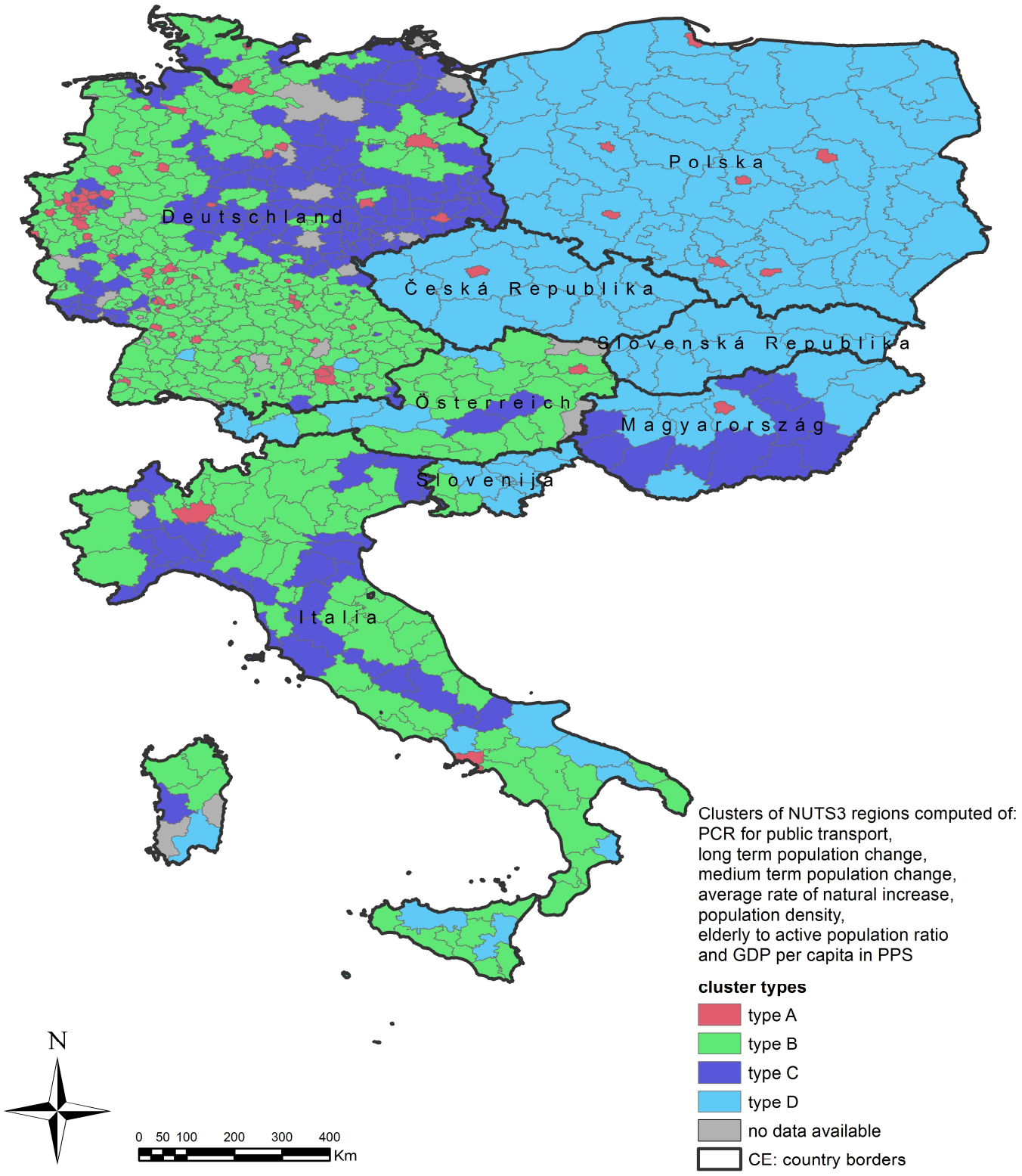
Tab. 2.9. Clusters of similar regions in Central Europe: PCR_PLI_TRA, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08

CLUSTER	TERRITORIES (NUTS3) INCLUDED IN THE CLUSTER	CHARACTERISTICS
TRA_1 TYPE A	AT130; CZ010; DE111; DE122; DE125; DE126; DE129; DE131; DE144; DE211; DE212; DE213; DE21H; DE221; DE232; DE241; DE252; DE253; DE254; DE261; DE263; DE271; DE300; DE501; DE600; DE711; DE712; DE713; DE714; DE731; DE801; DE911; DE913; DE943; DE944; DEA11; DEA12; DEA13; DEA14; DEA15; DEA17; DEA19; DEA1A; DEA1C; DEA21; DEA22; DEA23; DEA24; DEA32; DEA33; DEA41; DEA51; DEA52; DEA55; DEB11; DEB34; DEB35; DEB38; DED21; DED31; DEF01; DEF02; HU101; ITC45; ITF33; PL113; PL127; PL213; PL22A; PL415; PL514; PL633	Spatial characteristics: - 51 predominantly urban regions, - 20 intermediate regions, - 1 predominantly rural region. Statistical characteristics: clustered territories present the highest values of PCR_PLI_TRA, GDP_08 and DENS_08; PCR_PLI_TRA and GDP_08 are much above the average.
TRA_2 TYPE B	AT112; AT121; AT122; AT123; AT124; AT126; AT127; AT211; AT212; AT213; AT221; AT222; AT224; AT225; AT311; AT312; AT314; AT315; AT323; AT331; AT332; AT333; DE112; DE113; DE114; DE115; DE116; DE118; DE119; DE11A; DE11B; DE11C; DE11D; DE123; DE124; DE127; DE128; DE12A; DE12B; DE12C; DE132; DE133; DE134; DE135; DE136; DE137; DE138; DE139; DE13A; DE141; DE143; DE145; DE146; DE147; DE148; DE149; DE214; DE216; DE217; DE218; DE219; DE21B; DE21C; DE21E; DE21F; DE21G; DE21I; DE21K; DE21L; DE21M; DE21N; DE224; DE225; DE226; DE227; DE228; DE229; DE22A; DE22B; DE22C; DE234; DE235; DE236; DE237; DE238; DE239; DE245; DE246; DE247; DE248; DE251; DE255; DE256; DE257; DE258; DE259; DE25A; DE25B; DE25C; DE264; DE266; DE267; DE268; DE269; DE25A; DE26B; DE26C; DE274; DE275; DE276; DE277; DE279; DE27A; DE27B; DE27C; DE27D; DE27E; DE412; DE413; DE414; DE423; DE424; DE426; DE428; DE716; DE717; DE718; DE719; DE71A; DE71B; DE71C; DE71D; DE71E; DE721; DE722; DE723; DE724; DE732; DE807; DE80E; DE914; DE915; DE91A; DE922; DE929; DE931; DE933; DE935; DE936; DE937; DE938; DE939; DE93B; DE941; DE946; DE947; DE948; DE949; DE94B; DE94C; DE94D; DE94E; DE94F; DE94H; DEA1B; DEA1D; DEA1E; DEA1F;	Spatial characteristics: - 53 predominantly urban regions, - 141 intermediate regions, - 97 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of POPCH_11_91.

	DEA25; DEA26; DEA27; DEA28; DEA29; DEA2A; DEA2B; DEA2C; DEA34; DEA35; DEA37; DEA38; DEA42; DEA43; DEA44; DEA45; DEA46; DEA47; DEA54; DEA57; DEA58; DEA5A; DEA5B; DEA5C; DEB13; DEB17; DEB18; DEB19; DEB1B; DEB21; DEB23; DEB25; DEB32; DEB39; DEB3B; DEB3D; DEB3E; DEB3F; DEB3J; DEB3H; DEB3I; DED32; DEF06; DEF07; DEF09; DEF0A; DEF0B; DEF0C; DEF0D; DEG03; DEG05; DEG06; DEG0G; ITC11; ITC15; ITC16; ITC20; ITC41; ITC42; ITC43; ITC44; ITC46; ITC47; ITC49; ITC4A; ITC4B; ITD10; ITD20; ITD31; ITD32; ITD34; ITD35; ITD36; ITD41; ITD42; ITD53; ITD58; ITD54; ITD59; ITE13; ITE15 ITE17; ITE18; ITE21;; ITE31; ITE32; ITE33; ITE34; ITE41; ; ITE43; ITE44; ITE45; ITF12; ITF13; ITF14; ITF32; ITF34; ITF35; ITF44; ITF45; ITF51; ITF52; ITF61 ITF63; ITF64; ITF65; ITG11; ITG13; ITG14; ITG15; ITG16; ITG18; ITG19; ITG25; ITG26; ITG29; SI018; SI023; SI024	
TRA_3 TYPE C	AT223; AT226; DE11B; DE215; DE21D; DE223; DE231; DE233; DE23A; DE244; DE249; DE24A; DE24B; DE24C; DE265; DE272; DE273; DE411; DE415; DE416; DE418; DE421; DE422; DE425; DE427; DE429; DE502; DE725; DE733; DE734; DE735; DE736; DE737; DE802; DE803; DE804; DE805; DE808; DE809; DE80B; DE80C; DE80D; DE80F; DE80G; DE912; DE916; DE918; DE919; DE91B; DE923; DE925; DE926; DE927; DE928; DE932; DE93A; DE945; DE94A; DE94G; DEA16; DEA31; DEA36; DEA53; DEA56; DEB12; DEB14; DEB15; DEB16; DEB1A; DEB22; DEB31; DEB37; DEB3C; DEB3K; DEC01; DEC02; DEC03 DEC04; DEC05; DEC06; DED11; DED12; DED13; DED14; DED15; DED16; DED17; DED19; DED1B; DED1C; DED22; DED23; DED24; DED25; DED26; DED27; DED28; DED29; DED2A; DED2B;DED33; DED34; DED35; DED36; DEE01; DEE02; DEE03; DEE04; DEE05; DEE06; DEE07; DEE08; DEE09; DEE0B; DEE0C; DEE0D; DEE0E; DEF03; DEF04; DEF05; DEF08; DEF0E; DEF0F; DEG01; DEG02; DEG07; DEG09; DEG0A; DEG0B; DEG0C; DEG0D; DEG0E; DEG0F; DEG0H; DEG0J; DEG0K; DEG0L; DEG0M; DEG0N; DEG0P; HU222; HU223; HU232; HU233; HU312; HU313; HU322; HU331; HU332; HU333; ITC12; ITC14; ITC17; ITC18; ITC31 ITC32; ITC33; ITC34; ITC48; ITD33; ITD35; ITD37; ITD42; ITD43; ITD44; ITD51; ITD52; ITD55; ITD56; ITD57; ITE11; ITE12; ITE14; ITE16; ITE19; ITE1A; ITE22; ITE42; ITF11; ITF21 ITF22 ITG28	Spatial characteristics: - 20 predominantly urban regions, - 85 intermediate regions, - 72 predominantly rural regions. Statistical characteristics: clustered territories present the lowest values of AVCBD_10_00 and POPCH_11_91 as well as the highest values of OADR_08.
TRA_4 TYPE D	AT313; AT321; AT322; AT334; AT335; AT341; AT342; CZ020; CZ031; CZ032; CZ041; CZ042; CZ051; CZ052; CZ053; CZ063; CZ064; CZ071; CZ072; CZ080; DE142; DE21A; HU102; HU211; HU212; HU213; HU221; HU231; HU311; HU321; HU323; ITF31; ITF41; ITF42; ITF43; ITF62; ITG12; ITG17; ITG27; PL114; PL115; PL116; PL117; PL121; PL122; PL128; PL129; PL12A; PL214; PL215; PL216; PL217; PL224; PL225; PL227; PL228; PL229; PL22B; PL22C; PL311; PL312; PL314; PL315; PL323; PL324; PL325; PL326; PL331; PL332; PL343; PL344; PL345; PL411; PL414; PL416; PL417; PL418; PL422; PL423; PL424; PL425; PL431; PL432; PL515; PL516; PL517; PL518; PL521; PL522; PL613; PL614; PL615; PL621; PL622; PL623; PL631; PL634; PL635; SI011; SI012; SI013; SI014; SI015; SI016; SI017; SI021; SI022; SK010; SK021; SK022; SK023; SK031; SK032; SK041; SK042	Spatial characteristics: - 16 predominantly urban regions, - 42 intermediate regions, - 57 predominantly rural regions. Statistical characteristics: clustered territories present the highest values of AVCBD_10_00 and the lowest values of: GDP_08, OADR_08, DENS_08.

Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map 2.10. Clusters of similar regions in Central Europe:
PCR_PLI_TRA, POPCH_11_91, AVCBD_10_00. DENS_08, OADR_08, GDP_08



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In case of transport services we can observe some groups of clusters types. Poland, Czech Republic and Slovakia regions are type D, accept large urban areas, which represent clusters of type A. We can also observe some differences in Germany, Slovenia and Austria, where division line runes East-West.

2.2. National levels: cost ratios of local public services

2.2.1. Austria

As it has been already stressed, due to several contextual aspects that differentiate public service provision across countries, it is useful to utilize a state level approach in parallel. By this one should understand following the same pattern of analysis in all Central Europe NUTS3 territories but looking for the specifics under national contexts. It gives national (regional) policy makers a better insight into cost-related issues within certain socio-economic system. At the same time comparisons across countries are still possible and for references concerning differences in service provision systems the reader may use thematic field studies described in chapter 3. As previously stated the PCRs were calculated upon the best available data sets – for years 2007-2011 - extracted from Amadeus by Bureau van Dijk. The data sets have been verified against their consistency and completeness. If the data set proved misleading the PCR was not calculated for a given country and field of the study. For this reason, for example, PCR_HOU was not calculated for Austria.

In r-Spearman correlation test PCR_HEA is significantly correlated with all variables. PCR_TRA is significantly correlated with GDP_08, AVCBD_10_00 (positive correlations) and OADR_08 (negative correlation). The remaining PCRs show no significant correlations (tab. 2.10.). The focused analyses concerning urban / rural / intermediate territories for Austria were not possible due to statistical limits.

Tab. 2.10. r-Spearman correlation test: Austria, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.641**	-0.005	0.144	0.171
POPCH_10_00 Population change (2010/2000)	0.646**	-0.013	0.274	0.126
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.628**	0.193	0.093	0.446*
DENS_08 Population density (2008)	0.568**	0.171	-0.026	-0.283
OADR_08 Elderly to active ratio (2008)	-0.701**	-0.192	-0.116	-0.424*
GDP_08 GDP per capita PPS (2008)	0.749**	0.118	0.203	0.433*
N	*23*	*25*	*20*	*32*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.2.2. The Czech Republic

In case of the Czech Republic neither of the PCRs is significantly correlated with variables selected for analysis (tab. 2.11.). The focused analyses concerning urban / rural / intermediate territories were not possible due to statistical limits.

Tab. 2.11. r-Spearman correlation test: the Czech Republic, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.288	-0.068	0.499
POPCH_10_00 Population change (2010/2000)	0.218	0.007	0.477
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.385	-0.068	0.007
DENS_08 Population density (2008)	-0.029	0.464	0.301
OADR_08 Elderly to active ratio (2008)	-0.218	0.059	0.226
GDP_08 GDP per capita PPS (2008)	-0.407	0.086	0.147
N	*14*	*14*	*14*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.2.3. Germany

It must be noted that the NUTS3 split in Germany is quite different in pattern than it is in the other analyzed countries. There are many smaller territories, which results in numerous observations and possibly higher correlations according to Tobler's law effect. In r-Spearman correlation tests all PCRs but PCR_SOC are significantly negatively correlated with POPCH_11_91 and AVCBD_10_00. All PCRs but PCR_WAT show significant correlation with DENS_08 and GDP_08 (tab. 2.12.).

Tab. 2.12. r-Spearman correlation test: Germany, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_HOU	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.202**	-0.285**	-0.087	-0.308**	-0.187**
POPCH_10_00 Population change (2010/2000)	-0.051	-0.124	0.042	-0.278**	0.039
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.118**	-0.180**	-0.037	-0.288**	-0.028
DENS_08 Population density (2008)	0.364**	-0.216**	0.362**	0.117	0.326**
OADR_08 Elderly to active ratio (2008)	0.099	0.094	0.029	0.246**	-0.001
GDP_08 GDP per capita PPS (2008)	0.318**	0.144**	0.191**	-0.027	0.276**
N	*380*	*230*	*411*	*282*	*400*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Having in mind the spatial characteristics in Germany in terms of predominantly urban intermediate and predominantly rural territories (tab. 2.13.-2.15.) PCR_HEA shows significant correlations with POPCH_11_91, DENS_08 and GDP_08 in urban and intermediate areas, while in rural areas it is significantly correlated with POPCH_11_91 and OADR_08. PCR_HOU shows significant negative correlations with POPCH_11_91, POPCH_10_00. AVCBD_10_00 in intermediate and rural territories that have not been identified in urban territories. PCR_WAT is significantly correlated with all variables but

GDP_08 in intermediate areas and only with AVCBD_10_00 in urban territories. Analysis in rural areas shows significant correlations with POPCH_11_91 and POPCH_10_00. PCR_TRA is significantly correlated with selected variables in urban and intermediate territories only. They are: POPCH_11_91 (negative) and DENS_08 and GDP_08 (positive).

Tab. 2.13. r-Spearman correlation test:
Germany - predominantly urban regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_HOU	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.333**	-0.169	-0.232**	-0.196	-0.293**
POPCH_10_00 Population change (2010/2000)	-0.083	0.171	0.022	-0.182	0.096
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.115	0.039	-0.053	-0.227*	0.078
DENS_08 Population density (2008)	0.540**	0.554**	0.334**	-0.012	0.451**
OADR_08 Elderly to active ratio (2008)	0.033	-0.127	0.011	0.163	-0.072
GDP_08 GDP per capita PPS (2008)	0.295**	0.332**	0.254**	-0.151	0.446**
N	*91*	*68*	*96*	*81*	*96*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Tab. 2.14. r-Spearman correlation test:
Germany - intermediate regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_HOU	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.148*	-0.310**	-0.073	-0.411**	-0.151*
POPCH_10_00 Population change (2010/2000)	-0.040	-0.209*	0.007	-0.367**	0.060
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.120	-0.289**	-0.067	-0.369**	-0.051
DENS_08 Population density (2008)	0.385**	0.188*	0.276**	0.222**	0.343**
OADR_08 Elderly to active	0.067	0.168	0.016	0.340**	-0.021

ratio (2008)					
GDP_08 GDP per capita PPS (2008)	0.343**	0.150	0.198**	0.050	0.324**
N	*188*	*121*	*201*	*139*	*194*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Tab. 2.15. r-Spearman correlation test:
Germany - predominantly rural regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_HOU	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.229*	-0.521**	-0.060	-0.303*	-0.182
POPCH_10_00 Population change (2010/2000)	-0.168	-0.514**	-0.084	-0.301*	-0.153
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.218*	-0.311*	-0.149	-0.238	-0.148
DENS_08 Population density (2008)	0.130	-0.233	0.028	-0.184	-0.136
OADR_08 Elderly to active ratio (2008)	0.254*	0.220	0.171	0.150	0.085
GDP_08 GDP per capita PPS (2008)	0.119	-0.340*	-0.121	-0.207	-0.150
N	*101*	*41*	*114*	*62*	*110*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.2.4. Hungary

The data set for Hungary allows pinpointing that PCR_SOC is significantly correlated with all variables used. The other PCRs show insignificant correlations with an exception of PCR_WAT – GDP_08 relation (tab. 2.16). The focused analyses concerning urban / rural / intermediate territories for Hungary were not possible due to statistical limits.

Tab. 2.16. r-Spearman correlation test: Hungary, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.005	0.504*	-0.075	-0.107
POPCH_10_00 Population change (2010/2000)	0.208	0.588**	0.105	0.026
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.209	0.592**	-0.096	-0.024
DENS_08 Population density (2008)	0.385	0.505*	0.259	0.155
OADR_08 Elderly to active ratio (2008)	-0.006	-0.447*	0.143	0.165
GDP_08 GDP per capita PPS (2008)	0.410	0.627**	0.458*	0.386
N	*20*	*20*	*20*	*20*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.2.5. Italy

The r-Spearman correlation tests for Italy show few significant correlations with demographic change indicators. None of the PCRs are significantly correlated with POPCH_11_91. All PCRs but PCR_TRA are significantly correlated with GDP_08. Besides: PCR_HEA is significantly correlated with AVCBD_10_00. DENS_08; PCR_SOC with POPCH_10_00. AVCBD_10_00. OADR_08; PCR_WAT with OADR_08. PCR_TRA shows no significant correlations with analysed variables (tab. 2.17.).

Tab. 2.17. r-Spearman correlation test: Italy, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.139	0.160	0.125	0.101
POPCH_10_00 Population change (2010/2000)	0.129	0.236*	0.153	0.141
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.293**	-0.238*	-0.167	-0.020
DENS_08 Population density (2008)	0.334**	0.054	0.097	-0.138
OADR_08 Elderly to active ratio (2008)	-0.177	0.304**	0.261**	0.103
GDP_08 GDP per capita PPS (2008)	0.237**	0.468**	0.269**	0.177
N	*100*	*107*	*105*	*103*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In a predominantly urban / intermediate / predominantly rural territorial split for Italy it is hardly possible to show any significant patterns of interdependencies. There are no significant correlations in rural areas. In urban areas PCR_HEA is significantly correlated with 3 of the variables: AVCBD_10_00. DENS_08, OADR_08. In intermediate areas PCR_SOC is significantly correlated with 4 variables (POPCH_10_00. AVCBD_10_00. OADR_08, GDP_08) and PCR_TRA with 3 variables (AVCBD_10_00. DENS_08, OADR_08) (tab. 2.18.-2.20).

Tab. 2.18. r-Spearman correlation test:
Italy - predominantly urban regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.249	-0.084	-0.269	0.125
POPCH_10_00 Population change (2010/2000)	0.261	0.020	-0.284	0.232
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.544*	-0.393	-0.222	0.057
DENS_08 Population density (2008)	0.498*	0.337	-0.385	-0.247
OADR_08 Elderly to active ratio (2008)	-0.494*	0.501*	0.232	0.030
GDP_08 GDP per capita PPS (2008)	0.410	0.465	-0.335	0.135
N	*18*	*18*	*18*	*18*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Tab. 2.19. r-Spearman correlation test:
Italy - intermediate regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.260	0.237	0.137	0.016
POPCH_10_00 Population change (2010/2000)	0.259	0.318*	0.180	0.120
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.119	-0.417**	-0.178	-0.329*
DENS_08 Population density (2008)	0.140	-0.134	0.006	-0.317*
OADR_08 Elderly to active ratio (2008)	-0.047	0.493**	0.235	0.299*
GDP_08 GDP per capita PPS (2008)	0.357*	0.621**	0.344*	0.208
N	*47*	*48*	*48*	*47*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance

Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Tab. 2.20. r-Spearman correlation test: Italy - predominantly rural regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_SOC	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.220	0.046	0.214	0.280
POPCH_10_00 Population change (2010/2000)	-0.211	0.144	0.232	0.200
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.030	-0.178	-0.237	0.218
DENS_08 Population density (2008)	0.324	-0.024	-0.019	-0.057
OADR_08 Elderly to active ratio (2008)	0.075	0.117	0.287	-0.048
GDP_08 GDP per capita PPS (2008)	0.039	0.225	0.312	0.191
N	*35*	*41*	*39*	*38*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.2.6. Poland

The data set analyses for Poland revealed numerous significant correlations for PCR_HEA and PCR_TRA (tab. 2.21.). On the other hand PCR_HOU and PCR_WAT show no significant correlations with demographic change indicators. All variables used are significantly correlated with DENS_08 (positively and negatively) and GDP_08 (positively).

Tab. 2.21. r-Spearman correlation test: Poland, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_HOU	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.330**	-0.032	-0.162	-0.292*
POPCH_10_00 Population change (2010/2000)	-0.330**	-0.026	-0.121	-0.288*
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.414**	-0.207	-0.197	-0.334**
DENS_08 Population density (2008)	0.616**	0.288*	-0.620**	0.431**
OADR_08 Elderly to active ratio (2008)	0.449**	0.180	0.110	0.297*
GDP_08 GDP per capita PPS (2008)	0.556**	0.301**	0.684**	0.526**
N	*66*	*61*	*66*	*66*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

In Poland the r-Spearman correlation test for predominantly urban territories (tab. 2.17.) show that all PCRs are strongly correlated with DENS_08 and GDP_08. In predominantly rural territories no significant correlations emerged (tab. 2.19.). Out of demographic change variables PCR_HEA is significantly correlated with POPCH_11_91 (negative: urban), POPCH_10_00 (negative: urban, intermediate), AVCBD_10_00 (negative: intermediate), OADR_08 (positive: urban, intermediate); PCR_HOU is significantly correlated with OADR_08 (positive: urban, intermediate); PCR_WAT is significantly negatively correlated with POPCH_11_91, POPCH_10_00 only in urban territories; PCR_TRA is significantly correlated with POPCH_10_00 (negative: intermediate), AVCBD_10_00 (negative: intermediate), OADR_08 (positive: urban, intermediate) (tab. 2.22.-2.24.).

Tab. 2.22. r-Spearman correlation test:
Poland - predominantly urban regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_HOU	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.556*	-0.055	-0.574*	-0.485
POPCH_10_00 Population change (2010/2000)	-0.568*	-0.049	-0.594*	-0.494
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.479	-0.511	-0.253	-0.468
DENS_08 Population density (2008)	0.874**	0.582*	0.774**	0.862**
OADR_08 Elderly to active ratio (2008)	0.726**	0.577*	0.365	0.650**
GDP_08 GDP per capita PPS (2008)	0.774**	0.637*	0.747**	0.785**
N	*16*	*13*	*16*	*16*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Tab. 2.23. r-Spearman correlation test:
Poland - intermediate regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_HOU	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	-0.396	-0.362	-0.176	-0.407
POPCH_10_00 Population change (2010/2000)	-0.428*	-0.341	-0.151	-0.438*
AVCBD_10_00 Average rate of natural increase (2000-2010)	-0.552**	-0.430	-0.236	-0.582**
DENS_08 Population density (2008)	0.554**	0.608**	0.459*	0.300
OADR_08 Elderly to active ratio (2008)	0.644**	0.555*	0.215	0.479*
GDP_08 GDP per capita PPS (2008)	0.555**	0.395	0.597	0.488*
N	*22*	*20*	*22*	*22*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance

Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Tab. 2.24. r-Spearman correlation test:
Poland - predominantly rural regions, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_HOU	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.054	0.230	0.134	-0.017
POPCH_10_00 Population change (2010/2000)	0.047	0.230	0.096	-0.062
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.015	0.100	0.219	0.018
DENS_08 Population density (2008)	0.384*	0.141	0.050	0.116
OADR_08 Elderly to active ratio (2008)	0.076	-0.296	-0.271	0.066
GDP_08 GDP per capita PPS (2008)	0.166	0.067	0.097	-0.077
N	*28*	*28*	*28*	*28*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.2.7. Slovakia

In case of Slovakia the number of NUTS3 territories in the country as well as the limited data set available make statistical reasoning mostly irrelevant. The r-Spearman correlation tests show no significant correlations (tab. 2.25).

Tab. 2.25. r-Spearman correlation test: Slovakia, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.551	-0.548	0.119
POPCH_10_00 Population change (2010/2000)	0.667	-0.381	-0.095
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.381	-0.357	0.381
DENS_08 Population density (2008)	0.476	-0.048	0.571
OADR_08 Elderly to active ratio (2008)	-0.381	0.357	-0.095
GDP_08 GDP per capita PPS (2008)	0.190	0.024	0.452
N	*8*	*8*	*8*

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

2.2.8. Slovenia

The number of NUTS3 territories in Slovenia as well as the limited data set available make statistical reasoning mostly irrelevant. The r-Spearman correlation tests show no significant correlations (tab. 2.26.).

Tab. 2.26. r-Spearman correlation test: Slovenia, PCRs, socio-economic variables

VARIABLE	PCR_HEA	PCR_WAT	PCR_TRA
POPCH_11_91 Long term population change (2011/1991)	0.392	-0.049	0.056
POPCH_10_00 Population change (2010/2000)	0.483	0.126	-0.056
AVCBD_10_00 Average rate of natural increase (2000-2010)	0.287	-0.084	0.238
DENS_08 Population density (2008)	0.517	-0.140	-0.252
OADR_08 Elderly to active ratio (2008)	0.175	-0.371	-0.007
GDP_08 GDP per capita PPS (2008)	0.538	-0.084	0.007
N	12	12	12

**- correlation coefficient significant at the 0.01 level of significance
*- correlation coefficient significant at the 0.05 level of significance
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

3. Empirical studies on social and network services and their infrastructure

The infrastructure and service provision in shrinking villages, towns and cities were at the centre of interest of empirical studies. The contribution provided by the chapter is mainly based on microeconomic analyses of the services and infrastructure as introduced in the methodology[111] conceptualized for the purpose of the project. Thanks to data and descriptions delivered by the ADAPT2DC partners, it was possible to provide detailed analyses of product demand and supply. This study is offered together with the context of legislation as well as national or regional system-based solutions to introduce the reader with cases. The reflections presented at the beginning of the chapter should help to understand the reader the big picture of local public service essentials and the differences over Central European countries. The cost analysis used in the field studies, that forms the second part of the chapter, is therefore an attempt to overcome the shortages of information on public service cost category in Eurostat statistics. The trends observed in cases regarding economic variables and ratios were used to analyse and identify the most probable reasons of dynamic situation of public service delivery economics, with demographic changes being one of them. Also, the investigation is meant to solve the problematic issue of direct price comparisons over the CE countries. The findings were presented on case-by-case rule, supported by synthetic comparative analysis for each field. Key factors behind the future changes were additionally investigated and integrated together with the results of the cost analysis. Since the study is focused on supporting practitioners, namely public managers and policy-makers, an attempt has been made to draw a complete picture of past, present and future of each of the services. The evidence-based analysis is followed by information on possible present and future drivers of change, therefore.

3.1 Field study areas

A selection of field studies, have been set-up by the ADAPT2DC partnership in order to enable better understanding of the changes in infrastructure and service costs related to

[111] Baron M., Ochojski A., Polko A.: Field Study Guidelines. Guidelines for WP3.2.2 implementation, ADAPT2DC, 2012

demographic changes. The products analyzed in the cases include basically two types of infrastructure: social and network. Network infrastructure is mainly characterized by infrastructural facilities linked in a network over the territory and thus roads, transportation as well as water is analyzed together. Social infrastructure can be spread over the territory or simply single-placed and does not necessarily need links between the facilities to offer the service. Here, the studied fields include: social care, health care and housing. The areas represented in the study cover both types of spatial characteristics that largely influence the economy of the service, i.e. urban type of territory and rural settlements (fig. XX).

Fig. XX. Territorial and sectoral coverage of the field studies

Sector type of service/ infras-tructure / **urban/ rural territories in Central Europe**	**Water and sewage, transport and roads network services and infrastructure**	**Social care, health care and housing social services and their infrastructure**
predominantly urban	Ljubljana (SI), Katowice (PL)	Ljubljana (SI) Katowice (PL)
predominantly rural	Vejprty (CZ) Saale-Orla-Kreis (DE) municipalities of Po Valley (IT)	Vejprty (CZ) municipalities of Po Valley (IT) Kozłów (PL) Jászárokszállás (HU)

Source: own representation

Six field studies have been arranged according to a methodological guidelines to provide knowledge on service and infrastructure in 14 territories regarding: public transport, roads, water, social care, health care and housing.

The partnership selected seven territories where detailed studies were held. The cases include Vejprty (CZ), Saale-Orla-Kreis (DE), Ljubljana (SI), municipalities of Po Valley (IT), Katowice (PL), Jászárokszállás (HU) and Kozłów (PL). Vejprty is a town located in Czech Republic. It's area equals 9,7 sq km. Over the last 10 years the population has decreased from over 3,4 thousand people to 3,3 th. citizens. The spatial structure of the town is rather

monocentric with low level of urbanization. The territory is well surrounded by green spaces and economic activities are based on old industrial areas located within urban tissue. Regarding the economy of the town and its employment, the services and industry dominate over the years in Vejprty. Saale-Orla-Kreis is a district with several municipalities located in Germany. It's area equals 1148,48 sq km and has just changed slightly over 2008-2010. The population in Saale-Orla-Kreis went down from 98592 to 87799 citizens. The spatial structure of the territory is polycentric and the are is sparsely urbanized. The territory is well equipped with leisure (sport) areas, green spaces and health resorts. The economic activities in Saale-Orla-Kreis are based on micro firms and SMEs located across the territory. The employment of the area is mixed and it is split between production and agriculture with no significant changes over the years. Ljubljana is a city in Slovenia. It's are equals 275 sq km. Over the years 2000-2010 the population went up by 10 thousand reaching a highest 280 thousand citizens in 2010. Over the years 2004-2006, a small decrease in number of inhabitants could be observed. The spatial structure of the city is monocentric with very high level of urbanization. The territory is equipped with green spaces, culture areas and leisure (sport) areas as well as science and education facilities. The economic activities in Ljubljana are predominantly based on micro firms and SMEs located across the territory. The employment of the area is dominated by professional, scientific and technical activities. There are were no significant changes over the years observed. Municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo form the Area of Po Valley. The area equals 290.73 sq km. The population of the municipalities has been rather stable over the last 10 years with 12,3 to 12,4 thousand inhabitants. The spatial structure of the area is polycentric with low level of urbanization. The villages offer lots of green as well as sport and leisure areas. The economic activities in Po Valley mainly combine agriculture with services based on micro firms and SMEs located across the territory. Katowice is a city in Poland. It's area equals 165 sq km. The population of Katowice has decreased over the 10 years from more than 330 thousand people to approx. 311 thousand inhabitants. The spatial structure of the city is polycentric with a high level of urbanization. The city, being the heart of a bigger metropolitan area offers, offers nearly all amenities that can be found in such a place. There are old industrial areas located within urban tissue as well as micro firms and SMEs clustered around the territory. The employment of the area is dominated by services with approx. 100 thousand people arriving to the city every day to work. Jászárokszállás is a town located in Hungary. It's area equals 77,17 sq km. The population of Jászárokszállás has decreased over the 10-year period to reach 8124 inhabitants vs. 8461 citizens in 2000. The

spatial structure of the town is monocentric with rather medium level of urbanization. The town offers green spaces. There are large industrial zones in the area and the employment is basically dominated by either service or industry. Kozłów is a village located in Poland. It's area equals 86 sq km. The population has significantly decreased over the 10-year period to reach 4868 inhabitants (as compared to 5155 in 2000). The spatial structure of the village is monocentric with low level of urbanization. The village offers green spaces and when it comes to the labor market, it is mainly agriculture-based. Economic activities include micro firms and SMEs.

3.2. Service delivery and its three perspectives

Basically, there are three perspectives that formulate the every-day economics of service delivery. It is an interplay of: local and national context regarded as legislation, the demand for the product and the supply of the product. There is a common belief that demand has a central place for any market service providers. In other words, the number of customers/users is regarded as key factor behind economics of market services. It is not exactly the same for local public services as the intervention or regulation by the national/regional system comes into force very often. Therefore, for public services delivered locally it is the supply that lies basically at the heart of the interest of the financing institution. This situation has been changing over the time with new trends in consumerism, governance or even the evolution of public management giving floor to bottom-up initiatives and more voice for consumers. The cases offered below, describe national frameworks that impose certain activities and the way the systems are organised. The characteristics of the products and their value chains have been investigated in terms of standards, technology, management and financing. It has made possible the extensive understanding of supply side of the service delivery. To complete the picture of service specifics, the description of the demand has been incorporated.[112]

3.2.1. The contexts for social services and their infrastructure

Social care: the context of service delivery in Jászárokszállás, Hungary

The Hungarian social security system consists of three subsystems, i.e.: compulsory social insurance (including medical care and pension insurance); unemployment management; social services (including financial aids and in-kind contributions). The Fundamental Law of

[112] M. Baron, A. Ochojski, A. Polko (2012), part I

Hungary (25 April 2011) guarantees numerous rights for all members of the society. Apart from this there are other legal acts that serve as a framework for social care. The Act III of 1993 on Social Governance and Social Benefits sets forth comprehensive provisions on the rights of users of social institutional services. It determines certain types of financial and in-kind social services, conditions of entitlements to social services. Basic and specialized social services, management and operation of social institutions, possibilities of resorting social care and financing social services are regulated by this law. Moreover, The Act CLXXXIX of 2011 – Local Government Law – describes duties and services to be covered by local communities. Child welfare and other social services are among the fundamental tasks on the local level. Basic social services encompass children support, but there are also offers aimed at elderly people and disabled people assistance. Nurseries and kindergartens are among the basic child welfare services. Kindergarten is compulsory from the age of 5 (starting from 1 September 2014 it is expected to be compulsory from the age of 3). The state basically controls implementation of legal frameworks. The financial sources of social care are ensured locally from local inland revenues, however the national government supports local governments from the state budget (contributions are determined yearly by the actual up-to-date budget law). Social aids are provided by the government for the commune according to number of people in need of financial support, and the commune distributes the aids to the local needy people. Financing of day-to-day services delivery is handled by social care centres established by local authorities. Local governments are managing the financial issues of maintenance of social care infrastructure through the establishment of social care centres. It is worth mentioning, that currently Hungary is undergoing the implementation of administrative reform (introducing districts), which may change responsibilities of communities and districts.

Social care: the supply perspective in Jászárokszállás, Hungary

The social services in Jászárokszállás include: home care, social catering, daycare of elderly people, daycare of disabled people, family assistance, child welfare service, alarm-system based home assistance, support service, public psychiatric service. Quality of social services is standardized across the country, whereas organizational patterns are decided by local governments. It is upon their political will to implement solutions concerning delivery. In Jászárokszállás focus was set on improving accessibility and more efficient institutional management. Particularly, following actions have been taken: the retirement home was built

in 2004; the kindergarten and the local elementary school were divided (a new kindergarten was established at the outskirts of the town with 4 groups of children); nursery capacity increased from 17 to 28; the Service for Family Support and Child Welfare was moved to a common building with the local surgery in 2002. The municipal social care centre in Jászárokszállás manages all institutions dealing with social care: nursery, kindergarten, Service for Family Support and Child Welfare, Senior Club and Retirement Home. Moreover, there are some civic providers of social care services. Szent Erzsébet Karitasz Group is the most important one. As a religious organisation it offers support to the most deprived persons. Social care expenditure is included in the year budget of the municipality. Anyway it is possible to donate extra funding either individually or through: foundations, local initiatives, charity events, etc. Beneficiaries can offer subsidies to cover some operational costs. In case of the kindergarten local enterprises provide financial subsidies for its operation. A certain proportion of the pension of retired people living in the retirement home becomes a compulsory contribution to the operational costs.

Social care: the demand perspective in Jászárokszállás, Hungary

The outskirts of Jászárokszállás became lately an investment site, with industrial park operating in the area. As the settlement has a rather big catchment area because of the growing employment possibilities, there are newcomer families who need to place their children in the local nursery. Therefore increasing the number of places in the nursery was necessary. The depopulation is mainly characterised by population decline due to the natural mortality of the aging people. The aging of the society increases demand for services offered as social care to disadvantaged and severely disadvantaged people.

Social care: the context of service delivery in municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo (Valley Po area), Italy

The social security system in Italy is regulated by state and regional laws. The large reform of 1978 that led to introducing the Law no. 833/1978 determined levels of medical care to be guaranteed to all citizens. Other aspects are included in the national legislation in the field of public welfare and social services by law n.289/2002. The application of national laws relating to social assistance are delegated to the regional authority. In case of the Po Valley area also regional Law no. 01/2004 applies concerning social care "Rules for the implementation of integrated regional system of interventions and social services and the

reorganization of the legislation of reference". Under national and regional law, regional governments plan and organize social care services. Communes individually or in consortiums are responsible for providing the services. Social care activities are mainly targeted at low- income citizens, children, elderly, disabled, people with chronic diseases, unemployed people, unmarried mothers, etc. It is funded by communes with state, regional and own financial resources. In some cases a co-financing of users is expected.

Social care: the supply perspective in municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo (Valley Po area), Italy

The Po Valley area covers communes of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo. In terms of social services delivery the provision is based upon a consortium Monviso acting on behalf of all local governments. The board of the consortium controls the overall alignment to national and regional regulations. Primarily, services for people with low incomes as well as for elderly and children are offered. They include: foster care, economic one-off subsidies, other subsidies, integration of youth, handicapped and mentally ill (in community house or in daytime center), nursery and daytime care for disabled. The quality and accessibility of the service offered is partly limited due to limited budgets allocated for their purposes. In the last years, due to reduction of government funding, communes had to enable funds by transferring them from the other functions to maintain acceptable quality of services. Transfer of some powers from the state government to the regions did not bring significant improvements. An additional unfavourable condition for services organization origins from the mountainous character of the Po Valley. High cost of transportation and difficulties linked to the quality of roads in high mountains strongly impact the delivery.

Social care: the demand perspective in municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo (Valley Po area), Italy

The area is covered by small mountainous and rural communities. Due to low birth rate, the share of elderly population increases in the Po Valley, affecting mainly social care needs. The number of social care beneficiaries grows. In addition, migration of young family members to bigger towns in search of work causes that senior citizens are often left lonely and without proper care. Therefore they expect wider participation in social care schemes. A substantial change in the amount of social services users can be observed. The key reasons for that are: progressive ageing of the population, decline in youth and immigration of seniors

from foreign countries. These processes led to emergence of new needs that are not answered yet certainly due to lack of financial resources. Moreover, not only the high-mountain villages suffered the depopulation phenomenon, but the middle and lower lands were additionally touched by loss of jobs in comparison with the previous decades. Due to this the funding stream to cover support to low cost family rentals and assistance to familiar crises (family abuses, abandonments, divorces, etc..) grew. To counterfight negative demographic trends in the area, a fund supporting establishment of new families has been introduced.

Social care: the context of service delivery in Kozłów, Poland

The social care system in Poland is based on the Social Care Act of 12 March 2004. Other legal regulations include the Family Benefits Act, Social Employment Act, Social Cooperatives Act, and a number of executive ministerial regulations. Under the Social Care Act communes are obliged to run local social care centres, which provide the majority of social care services including financial and non-financial assistance. The communes are also required to draw up social care strategies. The communes are responsible for providing shelter, alimentation, and clothes to people in need, granting long-term and emergency financial benefits, organising social work, providing community housing, meals for children, maintaining nursing homes, etc. These activities are mainly targeted at low-income citizens, especially large families, children (e.g. supplementary alimentation at school), disabled people (permanent or special benefits, care services), the elderly, people with chronic diseases (nursing homes), unemployed people (special or temporary benefits) but they also cover other groups such as homeless people, ex-prisoners or anybody facing emergency or hardships. Activities are financed by the commune's budget, nevertheless the local governments receive a general subsidy from the state that includes participation in social care system. The same refers to infrastructure maintenance. In terms of reacting to depopulation issues, communes are equipped with legal and institutional powers and tools to affect social reality and react to changes including demographic ones. The communities develop strategies and local regulations to identify and address social issues. The actions stipulated are implemented by institutional resources; primarily by local social care centres. By providing social assistance, the centres may encourage people to stay in the commune rather than migrate. Also, assisting families may result in higher birth-rates.

Social care: the supply perspective in Kozłów, Poland

Kozłów is a small, agricultural community with high long-term unemployment. Other factors affecting social care needs include increasing share of elderly population, outmigration of young family members abroad or to bigger towns in search of work. As a consequence, senior citizens are often lonely and left without care. A considerable share of young residents are unemployed and threatened by alcoholism. Social care offered by the commune does not cover full range of services; however the system of referrals is in place to ensure that all people in need receive support even if in other communes. Child and family support may result in less people willing to migrate, whereas care services and ensuring nursing home placement are meant to provide for the needs of the increasing population of senior citizens. Social care in Kozłów is based on public institutions within the national social care system. The only service provider is the local social care centre. The centre also manages family benefits and child support fund. Apart from the centre, only one of the local schools offers out-of-school childcare. There are no community day-care facilities or nursing homes. The centre provides care to those in need (7 beneficiaries) and refers patients with more serious conditions to nursing homes covering their maintenance costs (9 beneficiaries). Technical and infrastructural challenges of services delivery include the lack of transportation means (no dedicated cars or possibility of using cars managed by the local administration) which, combined with poor public transportation, poses a serious difficulty for social workers. Moreover, due to new statutory regulations the local social care centre has been assigned new tasks without receiving bigger funds. The new tasks include: paying housing benefits, violence prevention, foster care, family benefits and child support fund. Also, human resources and accounting, previously dealt with by the local administration, have been transferred to the social care centre. These changes increased the workload of the social care centre without providing additional capacity or funding. As a consequence, the quality of services has been jeopardised.

Social care: the demand perspective in Kozłów, Poland

The challenges described hinder the reaction to population shrinkage. The area is sparsely populated and the number of senior citizens and other social care beneficiaries increases. Especially some areas face social exclusion, such as the former State Agricultural Enterprise with high unemployment rates, alcohol dependency, passive approach and lack of basic skills. The social care centre, with excessive workload and limited funds, faces serious difficulties providing adequate service.

Health care: the context of service delivery in Jászárokszállás, Hungary

Public health services in Hungary fall within the remit of the central government, in particular the Ministry of National Resources, which provides these services through the National Public Health and Medical Officer Service (NPHMOS). The NPHMOS is responsible for public health; social medicine and health administration; supervising health service delivery; monitoring and evaluating sanitary conditions, epidemiological issues and changes in the population's health status; and for health promotion and prevention. Municipalities are responsible for primary health care, including family doctor services, dental care, out-of-hours surgery services, mother and child health, nurse services and school health services. The provision of secondary and tertiary care is shared among municipalities, counties, the central government and private providers. In Hungary the health care services on local governments are defined by the 43/1999 Government Decision. The Decision defines the concept of consulting hours of family doctors, which means 8 hours a day (on working days), 40 hours per week in total. Beyond that the doctors have to be on duty to secure continuous care. The territorial impoundment is principally determined by the number and age structure of population (adult district: 1200-1500 people over 14 years old; mixed district: 1200-1500 people regardless of age; child district: 6-800 people under 14 years old). The family doctors' payment is determined by the number of population: the more the population is in a certain district, the less the payment is. The settlement type (capital city/city, village, or more villages) has an effect on the salary as well (the settlement size is in inverse ratio to the amount of salary). Hungary's healthcare system is financed through the Health Insurance Fund (HIF), which is primarily responsible for recurrent health care costs. Health insurance contributions are collected from employees, who pay 3% of their total income, and employers who pay 15% of the employee's gross salary plus a lump sum tax or 'healthcare contribution'. Patients make co-payments on certain services. Coverage is universal and provides access to all ambulatory and secondary hospital health care. All citizens are covered, regardless of their employment status. The government is paying contributions.

Health care: the supply perspective in Jászárokszállás, Hungary

There are several types of health care services in Jászárokszállás. Most of family doctors is operating in their own offices. They attend out-of-hours surgery service in a rotating system so the town has constant care. Every doctor and also the child doctor have trained nurses who take the nurse services, mother and child health services and school health services. Besides the town has also dentist centre and pharmacies. The responsibility of the family doctors are

divided into 4 different spatial sectors in the LAU which cover the whole territory of Jászárokszállás. The doctors are overloaded (one practice conatains1500-2000 people on average). In-patient care is available only relatively distant, in Jászberény (by territorial jurisdiction) as well as in the Szolnok County Hospital. In case of medical practice taken in private offices the maintenance of health care infrastructure is financed from practice budget. The central doctor's office is a municipal property, so the maintenance tasks are implemented by the municipality. The enterprises which are operating there (doctor, nurse, family supervisor, diabetic's club) share rental and overhead costs. State subsidies for procurement of medical instruments are available.

Health care: the demand perspective in Jászárokszállás, Hungary

Jászárokszállás characterises with the population decline due to the natural mortality of the aging population. Due to the developing industrial park there are job possibilities and thus depopulation do not appear in case of younger age groups.

Health care: the context of service delivery in Kozłów, Poland

The Ministry of Health is in charge of policy and regulation of the healthcare system in Poland. The three main sources of health care financing are: the National Health Fund, the state budget and self-governments. The National Health Fund with its regional branches manages the health insurance scheme and contracts the medical services. The centralized system imposes specified duties for self-governments and provides financing. Poviats (LAU 1) are responsible for organization of a wide range of medical services (e.g. hospital treatment). Communities (LAU 2) are the operators of local medical centers and provide primary health care for inhabitants. Poviats and communities are responsible for the maintenance of the buildings of their health care institutions. They sometimes finance or co-finance the purchase of medical instruments and facilities. The Minister of Health sets the rules of operations for the most of health services (centralized system). In some cases concerning health promotion and prevention (e.g. alcoholism prevention), the community can decide on some rules and create its own prevention policy on the local level.

Health care: the supply perspective in Kozłów, Poland

There is one Public Healthcare Center in the Kozłów community. The center provides the medical aid in the village of Kozłów and operates a medical point in the village of Kępie. There are no private medical services within the community of Kozłów. The offer consists of primary healthcare (physician, nurse, midwife, school hygiene), ambulatory specialized healthcare (gynecological and obstetric) and dental medicine. The local government as the provider of health care services helps to develop the Public Health Center in Kozłów, mainly through the financial participation in repairs and purchases of the medical equipment, which should lead to raising of standard of the Health Center. The local government also participates in a wide variety of actions concerning disease prevention and health promotion. The Public Health Center in Kozłów provides medical services based on the agreement with the National Health Fund's regional branch in Krakow. The Health Center is financially self-dependent. It "sells" it's services to the National Health Fund and thus obtains the funds for operating. The community is financially responsible for renovations of the building. The Kozłów Community has covered 50% of the cost of adapting the building to the needs of disabled patients (ramp for wheelchair users, adjusted toilets). The community has purchased the boiler for central heating system and the autoclave for sterilization of medical instruments. It has also financed the construction of the parking lot around the Health Center. The main technical and infrastructural challenges concern providing health care in the villages within the community (LAU-2 level), located at a considerable distance from the Health Center in Kozłów Village. Unfortunately there is no possibility of opening additional medical points or centers in those villages. There are some ways of adjusting health care services to the needs of ageing society (e.g. adapting the building were the medical services are provided, buying necessary equipment). However, there are difficulties in providing the same level of health care accessibility in the whole area of Kozłów community. The distance from some villages to the Health Center/ Medical Point can be a huge challenge for some patients, especially those not possessing their own cars. The health care is concentrated in the one building in Kozłów village. The only exception is the Medical Point in Kępie Village, which operates only once a week. The Medical Point in Kępie is situated in the building which does not fulfill standards required for providing medical services. Unfortunately the community does not have necessary funds to adapt the building.

Health care: the demand perspective in Kozłów, Poland

Despite shrinking population there is still shortage of specialist medical services. Patients face long waiting times when it comes to medical appointments and screening tests and,

especially, specialist examinations. As a consequence, it must be stated that the existing capacity is not sufficient and does not allow for a fully reliable and smooth service provision. It happens that patients are referred to remote medical centres in other communes or counties instead of being offered comprehensive treatment on the spot. From the patients' perspective it seems advisable that the availability of services be improved and their range extended. Additionally, upgrading the infrastructure (including equipment and facilities) is recommended. However, one may expect that the hardships will be gradually mitigated as the population declines and funds for improvements are raised.

Housing: the context of service delivery in Katowice, Poland

According to the Polish Constitution, public authorities has a duty to implement set of policies to meet the housing needs of citizens. Efforts should focus on: preventing and reducing homelessness, supporting the development of social housing and supporting homeownership efforts of citizens. At the national level activities mainly relate to financial support for housing development. By the end of 2012 there was a system of subsidies to mortgage for purchase dwellings or houses by families. Since January 2014, Polish government will introduce a new program of subsides to mortgage. The target group are young people (including single person, not only families as in the previous program). It must be admitted that housing price limits applied in the program, caused that young people from large cities where housing prices are high will not be beneficiaries. In practice, the legal obligations related to housing needs of poor people rests on the shoulders of local government. The main activities include providing social housing and housing subsidies for poor households. Furthermore, municipalities have a spatial policy supporting housing development by creating residential areas, selling land for housing propose at lower prices, issuing building permits etc. According to the Act (Law) of 21 June 2001 on the tenants right protection, municipalities are obliged to provide social housing. Particularly, the legal protection covers the following groups: pregnant women, minors, pensioners, unemployed people, tong-term ill persons. Local governments use public housing stock or rent dwellings on the market, and then rent them as a social housing. Local governments pay compensation for housing owners, if they do not provide social housing and tenants that should be evicted getting social flat, still live in the same dwelling. Rents in social housing may no be higher than 50% of the lowest rents in others municipal flats that do not have status of social housing. Households who meet the criteria of low-income and limited dwelling floor can apply for housing subsides. Municipal budget is the financial source of housing subsides. The

municipality subsidises part of the housing rent over 6 months. It covers part of the expenditure of the beneficiary. The municipality can offer reduced rent for those tenurers whose personal income is low. The amount of discount and the rules applying in his situation is set by municipal bard. Also, it is a competence of the board to allow renting public houses to those tenures whose activity and settlement is favourable to the community. It mainly relates to culture and artists.

Housing: the supply perspective in Katowice, Poland

The latest statistical data regarding ownership structure of public housing in Katowice date as of 2007. The volume and share in total housing was as follows:

- municipal stock – 14%,
- housing cooperatives – 44%
- private houses – 32,3%
- houses owned by companies – 7,9%
- civic board houses – 1%
- other houses – 0.8%

The structure has been changing gradually over years. The changes are a result of:

- a reduction of houses in housing cooperative as a result of transformation of ownership, the boards are hardly investing into new housing stock,
- a reduction of houses owned by companies, usually sold to the tenurers with a reduced price based on a relation to the company,
- a reduction of municipally owned houses that has been a subject of privatisation with a priority for the current tenurers (recently Katowice do not privatise houses),
- a reduction of single-left houses owned by municipality and neighbouring to a vast majority of hosuing communities,
- an increase of privately owned houses.

The municipal housing stock is covered by houses owned by the city and operated by "Zakład Gospodarki Mieszkaniowej" or other managing entities. The city is an owner of 99,95 shares of civic estate community set up in 1996.

Housing: the demand perspective in Katowice, Poland

The city is relatively large. It is at the heart of Silesian metropolitan area. For this reason, in general, there is a high demand on housing in the territory. The spatial changes include suburbanisation to the outskirts and to the neighbouring towns and rural areas. When it comes

to municipal housing stock it relies basically on social and not demographic trends. The city operates both social housing and municipal housing stock; in both cases the demand strongly exceeds supply. Due to the fact, the city rents the housing stock from private operators or housing cooperatives in order to fulfil legal obligations. The metropolitan character of the city makes the prices relatively high and therefore, the housing decisions made by those who does not qualify for municipal or social housing are limited mainly due to economic reasons (prices).

Housing: the context of service delivery in Ljubljana, Slovenia

Social housing supply in Slovenia is framed by Housing Act, National Housing Programme and National Housing Saving Scheme Act. Housing Fund of the Republic of Slovenia is legal entity established to promote and support national housing policy. Housing Fund mainly grants low-interest rate loans for co-investments and social housing, encourage new developments, renovations and maintenance of residential buildings. Municipalities and non-profit housing organisations are key actors responsible for social housing supply. Housing Act authorizes the municipalities for providing social housing. The framework for the operation of municipalities is provided by the state through the housing policy-making, legislation and finance frameworks. Municipalities provide non-profit and social flats. Non-profit housing organizations are another actor in providing non-profit housing at local municipal level. Organisations are buying, renting and managing the pool of non-profit housing units. Non-profit status enables them to gain favourable loans from Housing Fund and municipal budget, taxes and fees benefits. Most important national legalisation concerning privatization of the housing stock are Denationalization Act (1991) and Privatization of Public Owned Properties Act (1997). Slovenia experienced changes in the field of housing like other central European countries. Reforms from 1991 resulted in a disappearance of the relatively stable housing supply. The privatisation of the publicly owned flats in Slovenia has been extensive. The ratio between private owned flats and flats for rent had been 67% to 33% in 1992 After the process of privatization ratio changed, so in 2002 92% of dwellings were in private ownership and half of them located in urban areas.

Housing: the supply perspective in Ljubljana, Slovenia

The municipality of Ljubljana owns approximately 4.000 housing units, that is 0.3 % of the housing stock in Ljubljana municipality. Ljubljana in compliance with the national and municipal housing programmes and financial plan of the municipality build new housing

units, buy cheaper units, exchange units and renovate units. There are three main products offered within local housing policy: a) non-profit housing units are social instruments for which the rent is regulated by regulations. Non-profit units may be rented by persons who do not earn enough to buy their own housing; b) social housing units and housing maintenance loans are available just for low-income population; c) serviced housing for old citizens and rental buying of housing units from people 65+ in exchange for monthly rent target aged population in Ljubljana. The nonprofit and social housing is dispersed through the city. There is no difference in the quality and the location between non-profit and social housing units. The difference is merely in the persons who are entitled to rent these units. Public housing fund of the Municipality of Ljubljana is responsible for management of social public housing. Rules for operations are set by State and Municipality. Public housing is financed by Municipal funds (renovation/reconstruction or new buildings). The price of renting the public housing is approx 33% of the market rent. Public Housing Fund of the Municipality of Ljubljana in recent years implements social housing projects which incorporate energy efficiency and low carbon innovations. The Fund is interested in both demonstrating their commitment to sustainable development and reducing the energy bills for economically disadvantaged social groups. National housing programme introduces special privileges for acquisition and use of housing easier for individuals and families with low-incomes not able to resolve their housing problem or cover costs for maintaining the unit (single parents with children, families with several children, young families, people with disabilities and families with a disabled member, and other families and individual persons with low or no income).

Housing: the supply perspective in Ljubljana, Slovenia

Ljubljana is the largest city, political and cultural center of Slovenia. The place serves is a commercial, business, congress, transport, also scientific and educational center. For this reason, there is a high demand on housing in the city. Municipal housing stock rely on economic situation and municipal budget allocation. The city faces with high demand on public housing strongly that exceeds supply due to reasonable renting prices and lack of new housing developments

Housing: the context of service delivery in Vejprty, The Czech Republic

Municipalities became after 1989 owners of the previous state-owned flats except those which were returned to the original owners through restitution. Municipalities independently manage the flats in their ownership. The competence of municipalities is governed by the

Municipalities Act. The Civil Code regulates rules of housing rent. Since 1992 very slow process of rent prices deregulation was under the way until the complete deregulation from the beginning of 2013. The municipality may set down other rules regarding renting flats. Their responsibilities also included the creation of local housing policies. The local housing policy (if existent) is largely in hands of municipal council. This includes provision of flats to people in housing need. Flats available to poor people are not called social housing. In the Czech Republic there are no flats that have the legal status of social housing. As the public housing stock posed too high a financial burden on many municipalities (because of regulated rents, the absence of operation subsidies, and the high maintenance debt inherited from previous regime), many municipalities decided to sell part or all of their housing stock. Municipal flats has been sold to its current occupants at an advantageous price – initially to 'tenant cooperatives' and, since 1994, to tenants in the newly established homeowners associations. The remaining public housing stock is rented on the principles established by the local government. State offers no support (grants, soft loans, guarantees) to increase public housing stock for social service. The support of NGO to provide social housing and housing management is completely absent. In the Czech Republic, non-profit organisations can only apply for grants for the operation of shelters and dormitories.

Housing: the supply perspective in Vejprty, The Czech Republic

The municipality became the owner of previous state-owned flats after 1989. Most of flats were in not so good quality and with high cost for heating. 28.4 % of the dwellings belong to private owners, whereas 64.5 % of the stock is rent by tenants. The other forms of dwelling are marginal. Municipality owns public housing in all parts of the town. There are differences in quality between them but there are no ghettos or gated communities. The municipality offers public housing for rent. Tenant may be a person who are resident of the city. There are also two public buildings used as dormitory only for short term lease. The municipality sold only few flats in their ownership and their policy is not to privatise other flats and rent them. The department of housing management deals with the issues as a administrative unit of the city. The rules of maintaining and renting flats and every expenditure above specific level subscribe the municipality council. According to rules revenues and expenditures from rented flats should be equal. Revenues from rented flats are used for investments to these flats mainly for thermal insulation of the buildings. The municipality invested to thermal insulation of the buildings, to changing the windows in public flats and also invested to new playgrounds for children nearby and to improving the

neighbourhood of the buildings. The prices of rent are set by the municipality council and differ according to size and quality of the rented flat. There are different prices for flats whose were already thermal insulated and whose were not. The municipality tries to have low prices for rented flats because there are big expenditures for heating in this mountain region. The department of housing management tries to cooperate with tenants in this case.

Housing: the demand perspective in Vejprty, The Czech Republic

After 1989 many of factories and other employers left the town and with them many of educated and skilled people. Many of inhabitants in the municipality have social problems. There are not so many jobs in the municipality and its neighbouring areas, most of the inhabitants have to pay high commuting costs. There is quite big fluctuation of tenants. There are vacant flats in the municipality and their numbers will probably grow with ageing and shrinking. The municipality tries to divide bigger flats to smaller one to attract tenants. The most wanted are smaller flats and also flats of the worse quality with the lower rents.

3.2.2. The contexts for network services and their infrastructure

Public transport: the context of service delivery in Vejprty-Kadan area, The Czech Republic

The national framework that imposes activities of public transport on local governments in Czech Republic is based on a hierarchy. Namely, Ministry of Transport, regions and municipalities are involved. Czech Ministry of Transport orders supraregional transport. Intra-regional public transport is a mix of regional and local service. Long term cooperation and exchange of information facilitate the quality of service and offer. Part of the regional railway service is enabled through national / country-wide infrastructure and service. Up till 2002, Czech municipalities were responsible for ordering public transportation services. Since 2003, it is the duty of the regions. Regional authorities govern licensing and scheduling. For Usti region, “The Plan of Transport Services for 2012-2016” has been established. This conceptual and regulatory document is required by state law. Regional and organisational prerequisites of public transportation are described in the Plan. It divides the region into 23 operational units with an integrated tariff system. The organisation of public transportation on local level is based upon public tendering of selected carriers. State regulations apply. The Transport Department of Usti region takes the responsibility for service and occupancy monitoring. Necessary amendments can be introduced during the timeframe of any contract. Regional and local public transportation is by law financed by regional budgets. Fare reductions to privileged groups are guaranteed according to regulations by national government. These

include: children, pupils, students and disabled. Moreover, employee fares, discounts for pensioners, veterans and others can be offered locally. The improvement of public access to employment sites is based upon locally raised incentives.

Public transport: the supply perspective in Vejprty-Kadan area, The Czech Republic

The service offered in Vejprty as in the whole Usti region is a subject of private delivery, contracted by public authorities. Public transportation is predominantly offered by means of buses. There is one train line used during working time (days). The main traffic flows are provided by one bus line with an interval of 1 hr. in rush hours and 2 hrs. off peak, evenings and weekends. Product supply is driven by spatial and social changes. The regional Department of Transport responds to population decline and ageing. Nevertheless, it also takes into account existing cross-border links to the transport network in Saxony, tourism development and the interests of investors. Regarding sparse population and distances from the sub-centers, the users of public transportation see it as rather expensive means in terms of ticket price. In other words, travelling by own car is considered more effective than a bus or train. Therefore, integration of short, medium and long distance public transportation is the main action taken by policy-makers to upgrade the standard of public transportation and counterfight the growth of service costs. The setup of a system of major and minor bus lines, core rail transport, as well as: established regular intervals, increased transport on weekends, cyclobuses, ski buses, tourist lines to exposed locations were among the other actions taken by the authorities and operators. National website with a search engine facility as well as regional website ease access to information on timetables and fares. At the end of the day, the actions aim at an increase in the global demand for the services. For the future, there is an idea to integrate the regional system into the national one, with single ticket option. An integrated system is expected to allow better planning of service provision as well as its diversification. It is believed to be achieved thanks to availability of forecasts and scenarios over future demand and wider markets (related to population changes, tourism development, cross-border development, etc.). As the co-financing of public transportation is determined by regional authorities (Council of Usti Region), the region transfers significant funds to the operators. It compensates the difference between revenues and costs of service delivery. Recently, 1/3 of delivery costs has been covered by ticket revenues and 2/3 has originated from regional budget. Operators use tariffs based upon kilometers travelled. Since 2007, it is

an constant effort of Usti region to gradually unify tariffs to passengers valid for all connections and lines.

Public transport: the demand perspective in Vejprty-Kadan area, The Czech Republic

Recently, the number of passengers has moderately increased. The demand for services in sparsely populated areas relies mainly upon prices and bus lines and their characteristics. The users' perception of high ticket prices has already been stated. The bus lines flexibility is limited by: sparse road network and relatively small number of passengers in smaller towns and villages. It should not be questioned that radial pattern of public transportation lines is applied in the area. However, the unfavorable location of bus station and railway station might be a challenge in the case. The demand for services is also a matter of citizens' voice. For the moment, the most probable reason for future increase in demand is the decision of local government willing to make use of the voice of citizens regarding lines extension or simply changes over the standards.

Public transport: the context of service delivery in Saale-Orla-Kreis, Germany

After 1990 local governments are responsible for local transport. Transport is done by private or government owned companies by order of the local governments. The national framework for transportation is mainly imposed by Regionalisierungsgesetz (RegG) – „Federal Regionalisation Act", Personenbeförderungsgesetz (PBefG) – „Passenger Transportation Act" and Allgemeines Eisenbahngesetz (AEG) – „General Railway Act". The organisation on transportation on local level is based on RegG. First of all, it is the federal state who is responsible for the planning and organisation of short-range public transportation. Thus, all federal states but Hamburg, have their own rules for the organisation, financing and promotion of short-range public transportation (little similarities between the different federal rules apply). The tasks for road public transportation has been commited to the administrative districts. The financial assignments come from different sources of the state, the federal states and the administrative districts. RegG gives priority to the financing of the rail passenger transportation. Details of the financing of each federal state are regulated in the particular short-distance public transportation rules. The authorities and transportation companies receive the financial assignments via the responsible ministry or subordinated federal agencies. The two main financing instruments are: 1) regional and local railway - financed by the federal funds called "Regionalisierungsmittel" (Reg-Mittel) which include about €7 billion (of which 3.99% assigned for Thuringia) and 2) the

"Gemeindeverkehrsfinanzierungsgesetz" (GVFG) a body that gives further money to the states which they can use for improving transport situation in municipalities in general, of which about 40% should be paid for public transport. Since 2007 this financing is reduced and compensated by direct federal funds. It is planned to end this kind of financing in 2020. PBefG is the legal basis to realize the road public transportation. Both commercial and non-commercial transportation of people is regulated there. The act imposes regulations regarding the requirements for transportation companies to enter the market and to get a concession for providing short range public transportation services. If a concession expires, several companies can apply for a route concession at the relevant authority, except the route is advertised for non-profit transportation.

Public transport: the supply perspective in Saale-Orla-Kreis, Germany

The service offered in Saale-Orla-Kreis can be characterised by at least two categories of local road public transportation. First of all it is the regular routes within the district. Secondly, connections with the tourist destinations of the Thuringian Forest and towns in the neighbouring administrative district are offered. The service is provided by low-floor buses for the regional and local transportation as well as intercity buses and midi-buses. Additionally, there is a "call-a-bus" service. It has to be reserved about 2 hours before departure. The bus has its fixed route, stops and timetable but only goes its trip if at least one person called it. Normally the call a bus has the same price like the regular bus. In general, the service infrastructure consists of approx. 220 cars out of which more than 20 operates into neighbouring tourist district. The offer is supported by information regarding timetable, tariffs, road works. It is accompanied by general bus and railway information. Applications for different tickets are available. Newsletter is also provided for knowledge dissemination. Integrated network information is missing. Since 2005 local service providers were unified and started to offer services in two administrative districts Saalfeld-Rudolstadt and Saale-Orla. The holding takes responsibility for a common planning, transportation, marketing, investment, preserving and training. The holding introduced a pilot initative in one of the towns; traffic in Pößneck was modified by a new appearance and better routes and transfers (rebuilding of bus terminal, introduction of bicycle carriage options, marketing of public transportation as a good mean). The operators for public transportation selected by the administration unit are: Omnibusverkehr Saale-Orla-Rudolstadt GmbH (OVS); Omnibusverkehr Oberland GmbH (OVO); Personenverkehrsgesellschaft Neuhaus am Rennweg mbH (PVG). As mentioned, since 2005, the three companies were unified in a

holding company called KomBus. The company is also a part of Egronet (formed in 2000) that is a bi-national transport cooperation network between the Czech Republic and the German states of Bavaria, Saxony and Thuringia. The railway system in Saale-Orla-Kreis, as alternative for public commuting, offers an attractive clock-face scheduling (Taktverkehr) with mainly fast and frequent trains. Nevertless, the number of active lines have gone down during last years. The Thuringian law „Thüringer Gesetz über den öffentlichen Personennahverkehr (ThürÖPNVG)“ regulates that the public regional and local rail transport is ordered by the state of Thuringia and the public regional and local bus transport is ordered by the districts and the district-free cities (like Erfurt or Jena). In order to carry out its responsibilities in planning, ordering and organisation of regional and local rail services, the state of Thuringia authorized the publicly owned company “Nahverkehrsgesellschaft Thüringen mbH” (NVS) for carrying out these services. The NVS is also responsible for cooperation with neighbouring federal states and networking between rail and bus services. The operating companies receive compensatory payments subsidised by the Federal State of Thuringia. The companies set the prizes with feed-back from the district authority. The price scheme is authenticated by “Landesverwaltungsamt” - a state office. The price of a single ticket changes in relation to the distance.

Public transport: the demand perspective in Saale-Orla-Kreis, Germany

The spatial organisation of public transportation is dominantly formed by a network of larger towns as nodes. The base of the bus networks is a function of the school network, as the main portion of passengers are pupils. In general the demand has gone down. There has been a population decline that affected the number of passengers in buses and trains. Due to changes in demand, regular routes were changed to form the “call-a-bus” service. Also, effluent households from rural areas prefer individual transportation. Even though a significant decrease (15.5% in 2005 vs. 7.4% in 2012) of unemployment have lead to more commuting, it remains unclear whether the new employees use more cars or more public transportation. Finally, despite the pressures of local politicians, economic representatives and citizen groups aimed at reactivation of the railway line from Blankenstein in Saale-Orla-Kreis to Marxgrün in Bavaria (no trains since 1945), no success was achieved. Cargo transportation of wood and local and partly regional passenger transportation were expected there. There exist other groups with different levels of pressure for reactivation of deactivated rail lines, like Triptis-Unterlemnitz and around Schleiz.

Roads: the context of service delivery in Saale-Orla-Kreis, Germany

The road system in Germany is regulated both on national and federal level. Namely, it is the German constitution, Federal Highway Act (Fernstraßengesetz „FStrG") and federal legislation on road construction form key framework facilitating road management and maintenance. The federal states or responsible self-governing bodies govern motorways and other federal roads of long-distance traffic on behalf of the Federal Republic of Germany. On application of one federal state the Federal Republic of Germany is able to adopt the motorways and other federal roads in federally owned administration. The Federal Highway Act regulates the classification of the public roads in Germany. Federal highways are federal motorways and federal roads including particular passages through built-up areas. Apart from that there are at least four categories of roads: federal state roads (serve the transit traffic), district roads (serve the traffic between the districts), municipal roads (serve the traffic in municipalities and between them) and other public roads (mainly for special kind-of-use traffic). Road maintenance authorities are responsible for road organisation. Road maintenance authorities have the obligation to build and maintain roads and lanes. The administrative bodies of a given level take responsibility for their roads. However, municipalities may also be in charge of a federal state road or district road if one falls into their territory. The regional authority for construction and traffic is the upper road building authority and has a supervision of lower road building authorities. For example, the lower road building authorities of Thuringia are the departments of roads whose tasks include:

- design work for federal roads, federal state roads (open roads and passages through build up areas) and bypasses,
- building and maintaining of federal roads and federal state roads,
- preparation, coordination, monitoring and accounting of new construction and maintenance work for federal roads and federal state roads,
- planning, approving and monitoring of subsidies for municipal building operations,
- management of federal roads and federal state roads,
- exercising of traffic organisation and road safety,
- organisation of winter road clearance for federal roads and federal state roads.

When it comes to the financing of motorways and federal roads' construction and maintenance, it takes place by taxes and lorry (truck) tolls. The financing of federal state roads, district roads and municipal roads is held by the federal territorial authority. Finally, municipalities can get subsidies from the federal state of Germany to invest in their municipal

road infrastructure. On average, federal roads are financed in 65% out of the truck toll and approx. 35% in general tax based budget.

Roads: the supply perspective in Saale-Orla-Kreis, Germany

Saale-Orla-Kreis has a connection to the motorway network. It is crossed by the motorway A9 (Berlin-Nuremberg-Munich) and has five interchanges. District and federal state roads form the majority of roads in the district. There are only 121 km of federal roads in Saale-Orla-Kreis. There are rather no areas uncovered or insufficiently covered by road network in Saale-Orla-Kreis. Moreover, the authorities have paid attention to standards by means of upgrades and new roads construction. In particular, this concerns:

- the federal state road L 1093 that connects the municipals Birkenhügel, Pottiga, Blankenberg and Blankenstein to the federal road B90. which is the link to the motorway A 9 Nuremberg-Berlin via the interface Bad Lobenstein. The historical road network is not appropriate for an efficient handling of traffic. The state road L 1093 has the character of a mountain road with narrow curves, gradients of up to 8% and track widths of ca. 5,20 m. In case of oncoming traffic the situation can be insecure. In order to improve the traffic safety, a bypass Blankenburg was constructed in 2003-2006,
- the traffic at federal state road L 1095 was hit by an economic boom for space in the area of Lobenstein, Schönbrunn, Ebersdorf, Friesau. The territory has became a center in woodworking industry. Thus, the traffic through Schönbrunn, Ebersdorf and Bad Lobenstein in the direction of the motorway 9 and to the paper mill grew enormously. Also, there is an important center for tourism located to the North of Obere Saale. The traffic flow was limited due to the narrow built up places und the gradient of the federal state road L 1095 could not be improved. The building project is to improve the accessibility of the district town Schleiz for the inhabitants of Bad Lobenstein and surroundings,
- Via Gateway Thuringia is established to improve the availability of the motorway A9 in a length of 46km. In this context, the part between Triptis and Schleiz is to be enlarged from four to six tracks (construction started in 2011). The Via Gateway Thuringia is also responsible for the operation and maintenance between the interchange “Lederhose” and the federal state border.
- building of the bypass of the federal state road L 1093 in Birkenhügel. In this context, the federal road B 90 has to be expanded sectional. The L 1093 is a

significant road link in the region with a function of a tributary to the motorway A9, interface Bad Lobenstein. In this context, the economically important paper mill Rosenthal GmbH will be connected appropriate to the motorway A9. Due to the building of the bypass, the narrow passage through Birkenhügel is no longer required,

- the north-south motorway A9 crossing the Saale-Orla-Kreis should have been widened from 2 to 3 lanes before 2014.

In addition, this may lead to fewer traffic in town centres, as well as partial development of retail areas. However, there will be more traffic in general due to longer distances. When it comes to operation and management of roads in Saale-Orla-Kreis, regional authority for construction and traffic is the upper road building authority and has supervision of lower road building authorities. It is also responsible for overall tasks concerning road building. The lower road building authority is the road department for East-Thuringia in the city of Gera.
Financing of roads takes place, as mentioned before, with grants given by the federal State of Germany. The regulation is set according to Local Authority Traffic Financing Act ("GVFG"). It guarantees financial help for investments to improve the municipal traffic conditions. Since 2007 this financing is reduced and compensated by direct federal funds. Starting from 2014 the compulsory use for transport ends, it just has to be used for municipal investments. It is planned to end this kind of financing in 2020. The EU funding (2007-2013) has been used for co-financing of federal state road network in Thuringia.

Roads: the demand perspective in Saale-Orla-Kreis, Germany

Moving of people to larger towns in Thuringia or the towns in Saale-Orla-Kreis as a result of raising income of the inhabitants leads to lower number of population in rural part of the district. It may cause an increased usage of car transportation in commuting and less public transportation demanded as well as longer distances travelled. The car possession rate in Saale-Orla-Kreis remains more or less stable.

Roads: the context of service delivery in Ljubljana, Slovenia

The road system in Slovenia is regulated on national and municipal level. Road management and maintenance is organized according to spatial planning, building, environmental and transport legislation. The roads are maintained and financed by municipalities, roads classified as national and regional are financed by state. In particular it is the Public Roads Act and The Road Traffic Safety Act that regulate road network

operation. At national level the Ministry of Transport of the Republic of Slovenia established the Slovenian Roads Agency. The national body undertakes technical, developmental, organisational and administrative tasks relating to the construction, maintenance and protection of almost 6,000 kilometres of national and regional roads, some dual carriageway sections, national cycle routes, as well as tasks relating to freight and passenger road transport. The Slovene Roads Agency also include the preparation of proposals for investment into national roads under its jurisdiction, as well as coordination relating to the designing, construction and reconstruction of roads and its facilities

Roads: the supply perspective in Ljubljana, Slovenia

Ljubljana offers municipal roads that range for 1030 km. They are categorized as local roads and public pathways and public bicycle routes. Local roads are further categorized into main city roads, aggregated city roads and settlements roads. The road network in Ljubljana municipality is planned with spatial planning legislation and transportation standards. There are some actions up taken by Ljubljana that allow introducing new infrastructure. These include: payable parking zones, city bikes (*bicike(lj)*), urbana, accessibility, bike lanes implementing, creating pedestrian zones, finished city-road-ring. The actions taken to upgrade the standards follow the patterns of sustainable mobility and influenced environmental issues regarding public transportation. Also, regional development plan for 2014-2020 sets the priority for sustainable mobility. Municipality of Ljubljana in accordance to promotion of sustainable mobility supports implementation of bike lanes. There has been some closures of roads in the city to remove the vehicles from its center. Also, payable parking zones have been appointed in areas close to city centre. It is the city council who sets priorities and allocates financial sources for the development (investments) and maintenance of municipal roads each four years. Every year the plan is harmonized with the municipal budget. The Department for Commercial Activities and Traffic is responsible for up keeping of the municipal roads and road traffic safety. The department also ensures data maintenance with roads in Ljubljana's residential areas. *Cestno podjetje Ljubljana* is a commercial public company responsible for maintaining communal roads for the Municipality of Ljubljana. The service is regulated by national and municipal regulations and standards.

Roads: the demand perspective in Ljubljana, Slovenia

Two issues influence the demand for roads supply in Ljubljana. Promotion of sustainable mobility resulted in investments in bicycle routes and improvement of public transport services. The demand for improved services is still recorded for daily commuters to Ljubljana.

Water and sewage: the context of service delivery in municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo (Valley Po area), Italy

Public provision of water and sewerage treatment are basically regulated by "Environmental Rules (*Norme in materia di ambiente*)". Introduced in 2006, the legislation deals with reorganization of water services on the basis of optimal territorial ambit (ATO) at a regional level, administrated by the ambit authorities (A.ATO). ATOs are structures that have a legal personality who organizes, controls and grants the management of the integrated service. The ambits have been identified on the basis of different criteria:

- units of river basin or adjacent basins,
- geographical / territorial in function of the administrative boundaries of municipalities and provinces,
- overcoming of the fragmented management,
- size-appropriate management, defined on the basis of physical, demographic and technical parameter.

Integrated water service organization includes the uptake public services, adduction and distribution of water for civil use of the sewerage system, and depuration of wastewater in optimal ambits at a regional level. By definition, ATO is a structure that owns a corporation legal personality for each optimal territorial ambit delimited by the qualified region to which the exercise of the local authorities skills that concern the management of the water sources is assigned, including the organization of the water infrastructure. Concerning the identified area of study: the management of the integrated water service in Piedmont is structured in 6 optimal territorial ambits. In a historical perspective, since 90s. the changes to municipal management and the entrusting of services to over municipal and private operators started. The effort was made to solve a problem of a fragmented water system. Even though it is still exist, the case of fragmentation and problematic care for single units and small territories has been reduced. Changes to better plan the infrastructure were made to decrease fragmentation of water system. The financing of water and sewage system is based on tariffs introduced by A.ATOs. The tariffs are supervised by Supervisory Authority on water resources and waste (Ministerial Authority), based on the parameters provided by the ministerial decree 01/08/96

(in implementation of Galli law). The necessity to maintain low cost of public water lead to strong interventions of public subsidies.

Water and sewage: the supply perspective in municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo (Valley Po area), Italy

Infrastructure is owned by municipalities. The custodial manager or the single municipality administers the water networks, the sewerage system and the depuration structures (integrated water system). Usually every municipality owns different networks of aqueduct in order to be able to supply the needs of the users of the chief town and the peripheral areas. The same system applies to the sewerage system and depuration, that normally consists in a main purifier that works for the chief town, and Imhoff systems for the decentralized areas. The tariffs are set up according to annual consumption of water and change respectively the higher the amount of water used. Fixed fee incorporates cost of access to water and sewage network as well as water/sewage treatment. In order to maintain high standards to all customers, the network extension is included in annual planning actions to allow the access of main inhabited places and smaller villages and integrate it with waste depuration systems. There are some service operators who grant access to active information on the product consumption and personal contract details as an e-service (website access). There are 6 operators offering services to Po Valley citizens. The financing of the investments and the management costs are covered by the tariffs established from ATO and collected by every single operator. Apart from the regular spread of costs, there also are two specific cost items within the tariff. Namely, 8% of the tariff revenue is allocated to the mountainous communities and 1,5% is allocated for the recovery of the costs of the ATO.

Water and sewage: the demand perspective in municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo (Valley Po area), Italy

There are two issues that influence the demand for water and sewage services. First of all, the demand is a result of growth of residents possible due to friendly policies introduced in the mountainous areas. The mountain policies that are being implemented have a positive effect on rebuilding (a repopulation after years of abandonment towards the cities, and only in some areas). Secondly, the demand for services is temporarily growing due to tourism.

Water and sewage: the context of service delivery in Katowice, Poland

The framework for water and sewage services in Poland is mainly set by the Act on collective water supply and sewage (*Ustawa o zbiorowym zaopatrzeniu w wodę i zbiorowym odprowadzaniu ścieków, 2001*), ministerial regulation on tarrifs set-up (*Rozporządzenie ministra budownictwa w sprawie określania taryf, wzoru wniosku o zatwierdzenie taryf oraz warunków rozliczeń za zbiorowe zaopatrzenie w wodę i zbiorowe odprowadzanie ścieków, 2006*) and European directives (a framework for Community action in the field of water policy, 2000) incorporated under Polish water law. Water supply is a task solely under municipal responsibility. It is possible to set up a partnership of communities for the service provision. Citizens and companies can access the services based on the contract set between the operator and individual (or a group). The quality of water supplied to citizens is secured by national institutions and the information is provided on a regular basis by local authorities. The infrastructure built for water and sewage service should be constructed according to the spatial development plan for the community and set in a multiannual perspective. In other words, the infrastructure and its changes are mainly planned with regards to local spatial development plan. The operators willing to run locally business in the filed of water supply and sewage treatment need a concession provided by municipal authorities. Thus, all the activities being listed in the concession granted to the operator can be further on a subject of monitoring by local authorities. The operator of water service is obliged to plug-in a household or a company provided the statutory conditions are met. It is the municipal board that is responsible for the local conditions and standards of water supply. The tariffs are set-up for one year period. The calculation of costs and tariffs is mainly based on the previous year of operation as well as necessary cost of operation including maintenance, investment and other economic plans in relation to estimated demand. The operator is responsible for development plan that is accepted by the municipality. European funds were heavily used for modernisation of water and sewage infrastructure upgrades and development over the period 2000-2013.

Water and sewage: the supply perspective in Katowice, Poland

There is only one operator responsible for water supply in Katowice – "*Katowickie Wodociągi S.A.*". Water used for supply is provided to the operator on the basis of contracts by "*Górnośląskie Przedsiębiorstwo Wodociągów S.A.*". The operator does not own any sources of natural water. The infrastructure is build and modernised by a city-owned company – "*Katowicka Infrastrucktura Wodociągowo-Kanalizacyjna Sp z o.o*". The supply of water is basically divided into three products: a) water supplied to households, b) water supplied to

companies, c) water supplied to other bodies, mainly public service providers such as public schools, hospitals, administrative units, etc. The products may differ by price and technical standard (e.g.: pressure). Based on the new technical solution available to in the sector, there is more and more electronic devices used for standards and quality improvement. These include: mobile texting on emergency situation to customers, web-based service, quality and capacity electronic monitoring of the infrastructure, internal improvements towards managerial actions of the operator, etc. The product supplied to customers needs infrastructure improvements and development. In general any investment leads to new costs that should be covered by all the users of the system. Any activity towards new infrastructure development (e.g. related to suburbanisation) will result in an increase in cost and price (revenue). The depopulation may also influence a single user by an increase of prices. The product is often affected by technical damage on infrastructure due to coal mine activity in the area. All the sewage taken from contracted users of the system goes into naturally set-up areas of collection in order to reduce the amount of pumping on the sewage.

Water and sewage: the supply perspective in Katowice, Poland

The main issue behind the demand on water and sewage is twofold. On one hand, the massive technological improvement of day-to-day home-used infrastructure allows reduction of budgets spend on the service and an increase in the customer consciousness. On the other hand, there is an increasing demand for water in public facilities. With the new trends on smart city, it will be definitely a new pattern of change in the demand on the service and it may influence the total consumption and sewage treatment. Moreover, the settlement in the surrounding of the city itself and the necessity to build new infrastructure will increase demand for the service length of operation but it may not exceed the total service volume. The economic consequences for any investment on water and sewage is overtaken by the consumers who may not be willing to pay more, even though they have no other choice. In the user perspective, the demand on water and sewage services is reflected in the economics even though a beneficiary cannot easily find alternatives. The structure of housing - with a dominance of real estate houses and municipal houses over private houses - confirms that any changes to the demand are basically a result of price changes and new technical improvements and not a quantity of users. If the structure changed, there would be more options to invest into natural ground wells with pumps and micro sewage systems.

3.3. The economics of the service delivery: an analytical attempt

The main idea behind the analysis is to look for critical economic trends that are caused and related to the demographic changes in selected territorial cases. As mentioned at the beginning of the chapter, the field studies were analysed through the six types of infrastructure/services as well as further investigated as groups of two infrastructure-based categories, namely: the social one cumulating housing, health care and social care and network that combines water, roads and transportation infrastructure and services. The indicators described in the analytical part are calculated in 10-years perspective, where possible. The data availability is often limited and thus is makes the full and comprehensive comparability rather difficult. The time intervals of the observations starting from 2000 ends up at 2010 as newer observations are yet not available. The step of N+2 years in data gathered was used and it allows working on data for 2000. 2002, 2004, 2006, 2008 and 2010. The study reflects over the demographic or rather depopulation changes resulting in new situations over the product supply and influencing the product demand. Basic categories of costs and expenditure are confronted over the years. The inflation ratio has been taken into consideration when analysing the ratios but it has not been directly incorporated into recalculation of cost-related variables. A cumulated inflation was calculated to allow the verification of real cost changes over the 10-years period (tab. XX).

Tab. XX Cumulated inflation in CE countries over 2001-2010 [%]

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Czech Republic	4,5	6,0	5,9	8,6	10.3	12,7	16,0	23,4	24,1	25,6
Germany	1,9	3,3	4,4	6,2	8,3	10.2	12,7	15,9	16,1	17,5
Hungary	9,1	14,8	20.2	28,3	32,8	38,1	49,1	58,0	64,3	72,0
Italy	2,3	5,0	7,9	10.4	12,8	15,3	17,6	21,7	22,7	24,6
Poland	5,3	7,3	8,1	11,9	14,4	15,9	18,9	23,9	28,9	32,3
Slovenia	8,6	16,7	23,4	28,0	31,2	34,4	39,6	47,2	48,6	51,7

Source: own calculations based on Eurostat

The analysis presented in the following pages is as deep as the data allows. It uses descriptive analysis as well as charts to show the tendencies and their dynamics. The overall picture of whether there are links to depopulation has been investigated. The cost categories are described according to the methodological guidelines resulting from the project works. The guidelines have been provided for the studies over the microeconomics of the services

and infrastructure and their contextuality. They offer a set of investigation paths per filed that combines hypothesis on linkage between cost-related variables and other factors such as for example volume, demand, supply of substitutes or condition of municipality. For a complete explanation of indicators per field and the investigated cost-related variables see the annex[113].

3.3.1. Case studies in the economics of social services and their infrastructure

Social care: the cost-based indicators in Jászárokszállás, Hungary

The social care policy is not concerned notably by the stakeholders of the examined LAU, only compulsory national legal frameworks are taken seriously into account but no real political actions can be found in the background of local decisions linked to social services. The decisions of local people are expressing local needs. However these decisions are significantly driven by economy. Decisions of local stakeholders concerning social care need to follow demographic changes. Negative process that the local population is ageing. This fact vivified the various forms of social care services provided for elder people in the examined LAU2: home care, social catering, daycare of elderly people, alarm-system based home assistance, support service, and building the Retirement Home in 2004 - what is available for 28 residents – is also an action influenced by demographic changes. A positive demographic process is more or less balancing the negative changes: as the increasing employment possibilities in the industrial park of the examined settlement attract newcomer families to Jászárokszállás. In most cases these are families with young children or couples before having children. The positive migration figures are likely to influence local decisions on increasing the places available in the local nursery and kindergarten and also the launch of new forms of children daycare services. Presently it is both valid as the supply of social services linked either to upgrading standards (quality) or improving accessibility (quantity) of service. Concerning quality it is a positive change that the municipality achieved the construction the Retirement Home in 2004, what is still operating. The integration the previously separated kindergarten groups and creating a municipal kindergarten with two member institutions is another good example for positive changes. Both the member institutions are operating in previously existing refurbished buildings thus they can provide a service of better quality for children. As another example for improving quality it can be also mentioned that the municipality applied for a financial EU support for the energy restoration of the nursery and the kindergarten. In case of growing need for nursery places a demand is likely to appear to

[113] M. Baron, A. Ochojski, A. Polko (2012), part II

improve the accessibility of the service what will go along with upgrading the standard of the service as well. Growing needs on better quality services from the side of parents often occur, and the leader professionals of both the nursery and the kindergarten are aiming to adapt to these requirements. It is common that the parents of children attending the local children care institutions help in the reconstructions either with financial support or with voluntary work (e.g. painting, cleaning, etc.).

Tab. XX. Cost-related variables: social care in Jászárokszállás, Hungary

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	8,461	8,379	8,312	8,252	8,228	8,124
Area (sq km)	7717,00	7717,00	7717,00	7717,00	7717,00	7717,00
Budget income per capita (HUF/person)	NDA	127,34	166,39	209,08	188,13	190.38
Budget debt ratio (%)	3,20%	3,00%	0.20%	4,30%	9,40%	9,80%
FINANCE						
Total expenditure on LAU-managed social care (thousand national currency); excl. creche expend.	93623,00	103867,00	128916,00	147131,00	166018,00	165461,00
Total investment expenditure on LAU-managed social care (thousand national currency); excl. creche expend.	1405,00	317,00	14670.00	1592,00	5436,00	215,00
Total maintenance and repair expenditure on LAU-managed social care (thousand national currency); excl. creche expend.*	NDA	NDA	NDA	NDA	NDA	NDA
Total operational expenditure on LAU-managed social care (thousand national currency); excl. creche expend.	21755,00	30415,00	45455,00	80451,00	97554,00	92870.00
Total expenditure on direct subsidies paid to people under social care (thousand national currency); excl. creche expend.	70463,00	73135,00	68791,00	65088,00	63526,00	72376,00
Total expenditure on LAU-managed creche/day nursery (thousand national currency)	9016,00	9595,00	11967,00	17021,00	19115,00	16568,00
Total investment expenditure on LAU-managed creche/day nursery (thousand national currency)	952,00	65,00	51,00	506,00	502,00	238,00
Total maintenance and repair expenditure on LAU-managed creche/day nursery (thousand national currency)*	NDA	NDA	NDA	NDA	NDA	NDA
Total operational expenditure on LAU-managed creche/day nursery (thousand national currency)	8064,00	9530.00	11916,00	16515,00	18613,00	16330.00
Subsidies granted to LAU on social care (thousand national currency)**	34596,42	40288,79	44616,59	37032,90	42035,69	43534,35
Subsidies granted to LAU on creche/day nursery (thousand national currency)	2004,80	1758,90	3546,00	6900.00	9299,00	9882,00
CUSTOMERS AND VOLUME						
Number of people using social care infrastructure and non-financial service (thousand persons)	3,05	0.47	1,87	1,39	1,90	2,99
Number of people granted financial aid under social care scheme (thousand persons)	2,93	0.31	1,72	1,15	1,70	2,39
Number of children in creche/day nursery	21,00	22,00	23,00	20.00	27,00	26,00

Data	2000	2002	2004	2006	2008	2010
(persons)***						
Number of places available in creche/day-nursery	15,00	15,00	15,00	15,00	20.00	28,00
Economically active population (thousand persons)	4,76	4,77	4,72	4,74	4,75	4,72
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Average cost of social care per beneficiary	15658,64	133849,23	35869,78	58039,84	46090.51	30731,98
Average cost of social care per citizen	11,07	12,40	15,51	17,83	20.18	20.37
Average aid cost per beneficiary of financial social care	24065,23	236682,85	39901,97	56647,52	37302,41	30282,85
Average cost of social care per beneficiary of social care infrastructure and non-financial service	30686,00	222413,28	68939,04	106155,12	87686,15	55264,20
Share of external social care subsidies in LAU total expenditure on social care	0.37	0.39	0.35	0.25	0.25	0.26
Average cost of creche/day nursery per kid	429,33	436,14	520.30	851,05	707,96	637,23
Vacancy rate of creche/day nursery service	1,40	1,47	1,53	1,33	1,35	0.93
Share of external creche subsidies in LAU total expenditure on creche/day nursery	0.22	0.18	0.30	0.41	0.49	0.60

* Maintenance and repair expenditure is included in investment expenditure

** The national government in Hungary supports local governments from the national government budget as normative state contribution (social and child welfare, institutional normative state contribution). However excluding the normative state contribution no subsidies were granted to LAU neither for social care nor for childcare services in the examined years.

*** Before 2010 it was officially possible to admit more children to nursery than the pre-determined places.

Source: based on data gathered and delivered by Észak-alföld Regional Development Agency Non-profit Ltd

The average cost of social care per beneficiary increased nominally over the 2000-2010 period. The ratio's almost 100% increase, that describes the growth of the average cost of overall financial and non-financial services (but crèche) delivered to beneficiaries, is more a result of a raise in spending (77%) than a 2% decrease in the number of people using social care infrastructure and non-financial service. The increase in spending should be considered with relation to inflation that increased over 10 years by 72%.

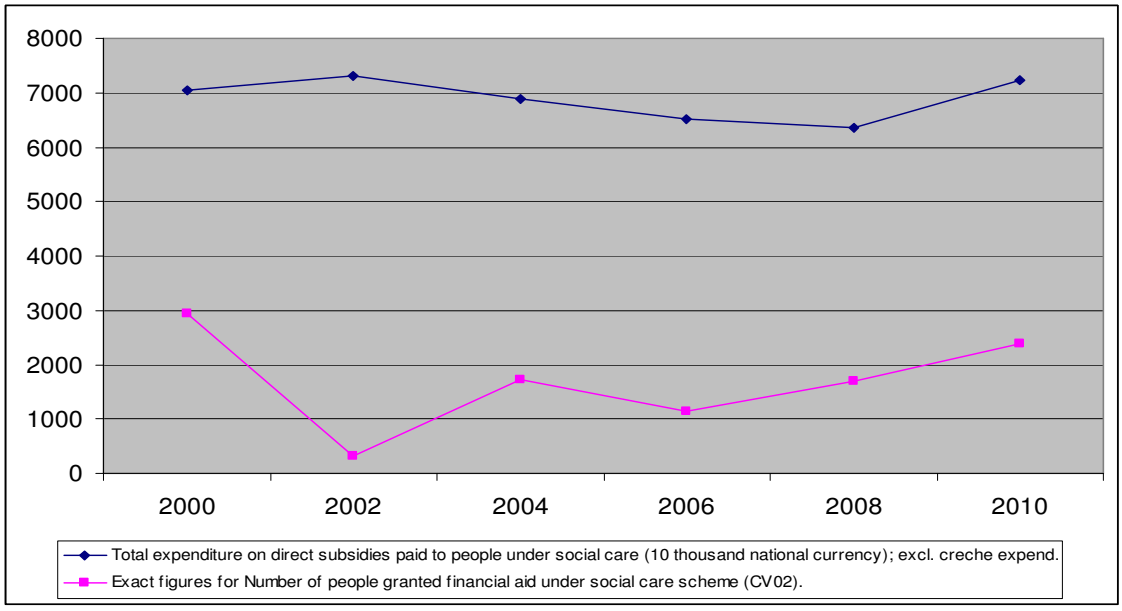
Nevertheless, an 18% decrease in the number of people granted financial aid under social care scheme is quite meaningful in the total average amplification of the value in the 10 years. One thing may be of significance here, despite the normative state contribution that has been increasing over the years (approx. a 14% per every 2 years of observations starting from 2000 and apart from 2006/2004 where a -17% is seen), it is the local budget that held the weight of financing the expenditure. The decrease was observed in the share of external funds on social care as compared to the total expenditure on social care. It showed a constant slow down of what has been added from the national level to total spending or put it the other way round an

increase of funds added from local budget. The national contribution share in total financing was at the level of 37% in 2000 and reached only 26 % in 2010.

The average cost of social care per citizen is a proxy of how much every citizen would pay for the social care if the system was just purely locally financed. Due to a decrease in the total number of citizens (a 4% over 10 years) and an increase in the total expenditure on social care, the ratio went up from 11 thousand HUF in 2000 to 20 thousand HUF in 2010. i.e. almost 100%. Anyway, the high inflation consumes much of the increase. At the same time the budget income per capita increased only a 50% and the budget debt ratio went up from 3 to nearly 10%. Community co-financing in total spending on social service is significant. It ranged 60-75% in the observed period.

The average cost per beneficiary of financial social care describes the average financial contribution delivered to beneficiary (fig. X). According to the table it has been changing much and reached a highest nominal value in 2002 (the number of customers to the service is significantly low as compared to the other years and the funding has been at the same level. The tendency observed for 2006-2010 shows a slow down of funding that was cut by 45%. Nevertheless, the graph shows a tendency of an increase in spending after 2008 that is related to the growth of the numbers of benefit-takers. It shows no co-relation to neither number of active population nor to the total population of the area.

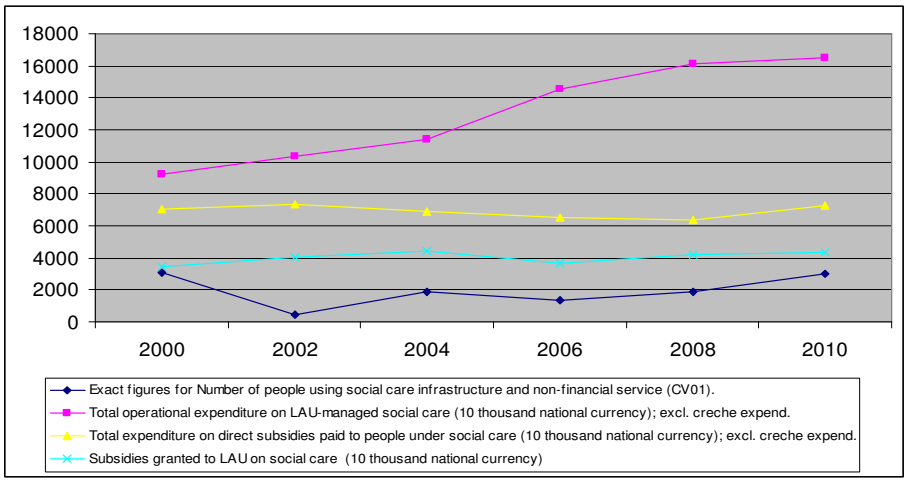
Fig. XX. The changes of financial social care subsidies in Jászárokszállás, Hungary



Source: based on data gathered and delivered by Észak-alföld Regional Development Agency Non-profit Ltd

The average cost of social care per beneficiary of social care infrastructure and non-financial service has gone down by a 50% after 2006. The year 2002 was reported as the highest nominal value. As seen in the graph (fig. xx) the decrease in the average cost is mainly related to a significant increase in number of people using social care infrastructure and non-financial service and does not reflect any real cost reductions.

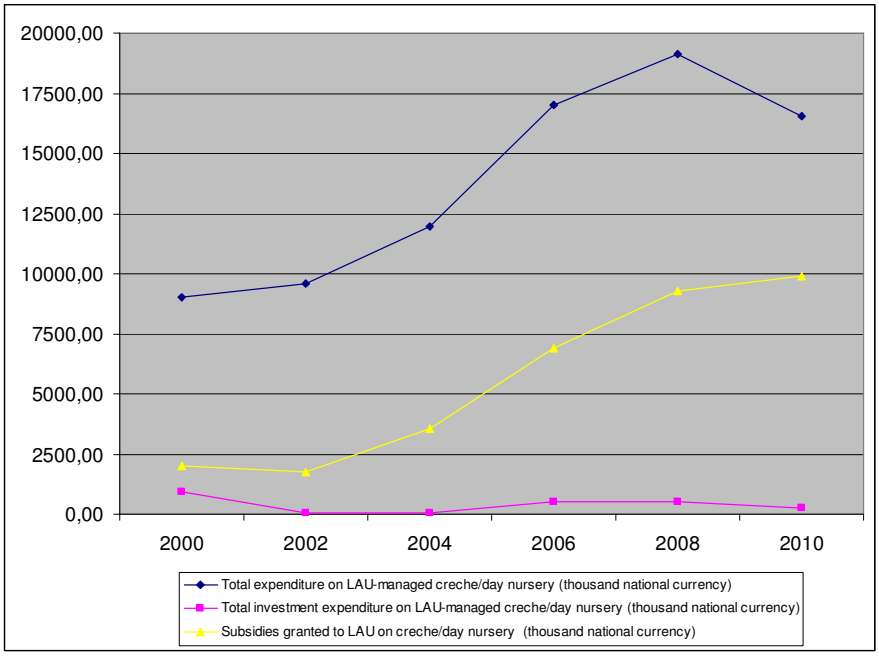
Fig. XX. Economic parameters of social care delivery in Jászárokszállás, Hungary



Source: based on data gathered and delivered by Észak-alföld Regional Development Agency Non-profit Ltd

The average cost of crèche/day nursery per kid went up as compared to a year 2000. The factors behind the change include: an increase of beneficiaries by a 23,8%, cumulated inflation within the period (76%) and it was followed by a significant growth of external subsidies on the nursery. Investment spending on crèche/day nursery, especially in 2006-2008 period, could also be taken into account.

Fig. XX. Economic parameters of crèche/day nursery delivery in Jászárokszállás, Hungary



Source: based on data gathered and delivered by Észak-alföld Regional Development Agency Non-profit Ltd

Finally, the ratio - vacancy rate of crèche/day nursery service, that describes the load on crèche services, reveals a potential of infrastructure growth in the years 2000-2006. More beneficiaries could actually use the service than the capacity of the infrastructure. The capacity has risen by 2008 from 15 to 20 and in 2010 reached a highest value, 28. The investments shown in 2006-2010 were used for that. The changes in the amounts of subsidies accessible and due thanks to the external financing has been growing starting from 2006 and they reached a highest 60% in 2010. The sums amplified operational cost, which means, most probably, that the money was used for day-to-day operations and the additional amounts were used for quality standards' improvement. The spending on investments, even if it is bigger than the one prior to 2006, do not show a significantly huge value as compared to external financing.

Social care: the cost-based indicators in municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo (Valley Po area), Italy

The objective conditions of the LAU Valle Po are very complex and interact in a variety of factors among which it is difficult to individuate the prevailing one. The territory consists exclusively of reliefs mountain at altitudes above one thousand meters which is matched by a low population density of an aging population. Under these conditions the choices of

stakeholders should be guided by the prevailing political criteria not divorced from economic criteria. Indeed, there are no neutral political choices. Each choice of an economic nature implies a choice of a political nature. It is also not possible to assess the use of resources only in terms of economic returns as well as in an area of densely populated plain. The reality is quite different. Shortage of financial resources requires their use on the basis of the solution of current problems. All this, coupled with other factors related to economic development, influence the progressive increase of the depopulation of the area.

The provision of social services in a particular area such as the Valley Po and in general in all the mountain areas, to an aging population, is extremely complex from an organizational perspective. This situation leads to a greater use of financial resources compared to other areas. Accordingly, the provision of services shall try as much as possible to meet adequately both the quality of services and the access to them. There is a trend of ever decreasing financial participation of national and regional institutions to local governments which are found to meet the requirements by drawing on the already scarce resources of their own. The users themselves are often called to participate in the costs. If this trend will not be reversed there will be a progressive deterioration of the overall quality standards. Improved access would be possible through a reorganization of technical services in the area best suited to growing needs. Nevertheless, it is now widespread opinion that this issue is very complex, requires profound reform of the whole system.

It is to reconsider a new design of services in the territory which considers them not only as a cost but as an investment. Improved accessibility to services may contribute to stop depopulation.

Tab. XX. Cost-related variables: social care in municipalities of Po Valley, Italy

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	14,36	14,40	14,42	14,43	14,41	14,35
Area (sq km)	290.36	290.36	290.36	290.36	290.36	290.36
Budget income per capita (EUR/person)	34,40	34,50	40.35	82,14	72,55	48,70
Budget debt ratio (%)	2,94%	2,98%	3,30%	6,68%	5,90%	3,78%
FINANCE						
Total expenditure on non-financial LAU-managed social care (thousand national currency); excl. crèche expend.	524,02	587,28	581,85	1195,35	1149,09	1157,77
Total expenditure on LAU-managed social care (thousand national currency); excl. crèche expend.	4895,75	4959,01	7344,35	11959,81	13761,77	26550.02
Total investment expenditure on LAU-managed social care (thousand national currency); excl. crèche expend.	NDA	NDA	NDA	NDA	NDA	NDA
Total maintenance and repair expenditure on LAU-	68,96	89,98	37,48	46,62	44,47	46,06

Data	2000	2002	2004	2006	2008	2010
managed social care (thousand national currency); excl. crèche expend.						
Total operational expenditure on LAU-managed social care (thousand national currency); excl. crèche expend.	368,40	420.54	412,54	1007,40	945,75	961,26
Total expenditure on direct subsidies paid to people under social care (thousand national currency); excl. crèche expend.	4371,73	4371,73	6762,50	10764,46	12612,68	25392,25
Total expenditure on LAU-managed crèche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total investment expenditure on LAU-managed crèche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total maintenance and repair expenditure on LAU-managed crèche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total operational expenditure on LAU-managed crèche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies granted to LAU on social care (thousand national currency)	4371,73	4371,73	6762,50	10764,46	12612,68	25392,25
Subsidies granted to LAU on crèche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
CUSTOMERS AND VOLUME						
Number of people using social care infrastructure and non-financial service (thousand persons)	0.02	0.02	0.03	0.52	0.70	0.83
Number of people granted financial aid under social care scheme (thousand persons)	0.03	0.04	0.07	0.08	0.10	0.13
Number of children in crèche/day nursery (persons)	NDA	NDA	NDA	NDA	NDA	NDA
Number of places available in crèche/day-nursery	NDA	NDA	NDA	NDA	NDA	NDA
Economically active population (thousand persons)	nda	7887,00	7932,00	7929,00	7778,00	7672,00
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Average cost of non-financial social care per beneficiary	97915,00	82650.17	73443,50	19933,02	17202,21	27656,27
Average cost of social care per citizen	340.93	344,38	509,32	828,82	955,02	1850.18
Average aid cost per beneficiary of financial social care	145724,33	109293,25	96607,14	134555,75	126126,80	195325,00
Average cost of social care per beneficiary of social care infrastructure and non-financial service	248235,50	252449,50	246061,00	23178,89	19723,20	32043,49
Share of external social care subsidies in LAU total expenditure on social care	0.89	0.88	0.92	0.90	0.92	0.96
Average cost of creche/day nursery per kid	NDA	NDA	NDA	NDA	NDA	NDA
Vacancy rate of creche/day nursery service	NDA	NDA	NDA	NDA	NDA	NDA
Share of external creche subsidies in LAU total expenditure on creche/day nursery	NDA	NDA	NDA	NDA	NDA	NDA

Source: based on data gathered and delivered by National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation

The average cost of non-financial social care per beneficiary decreased over the 2000-2010 period. The ratio went down by a 95%. Since the ratio describes the decrease of the average cost of non-financial services (but crèche) delivered to beneficiaries, it can be

explained as a result of a significant raise in the number of people using social care infrastructure and non-financial service. The increase is mainly due to the progressive ageing of an already old population and the introduction of new forms of assistance directed to people with mental illness, ex convicts and migrants. The total expenditure on LAU-managed social care changed more than four times in the given period (a 442% increase). The change is mainly seen as an increase of financial services granted under social service schemes. The expenditure on direct subsidies paid to people under social care went up 5 times in the 10 years period with higher values as compared every 2 years (amounting at 55, 60. 20 and 100% for the finally observed 2010/2008 change). All the financial aid to people under social care is under the line "external expenditure granted to LAU". Nevertheless, at the same time the reported number of people supplied with non-financial social services increased 40 times (200 beneficiaries in 2000 and more than 800 in 2010). The national contribution share in total financing was at the level of approx. 90% with a highest 96% in 2010.

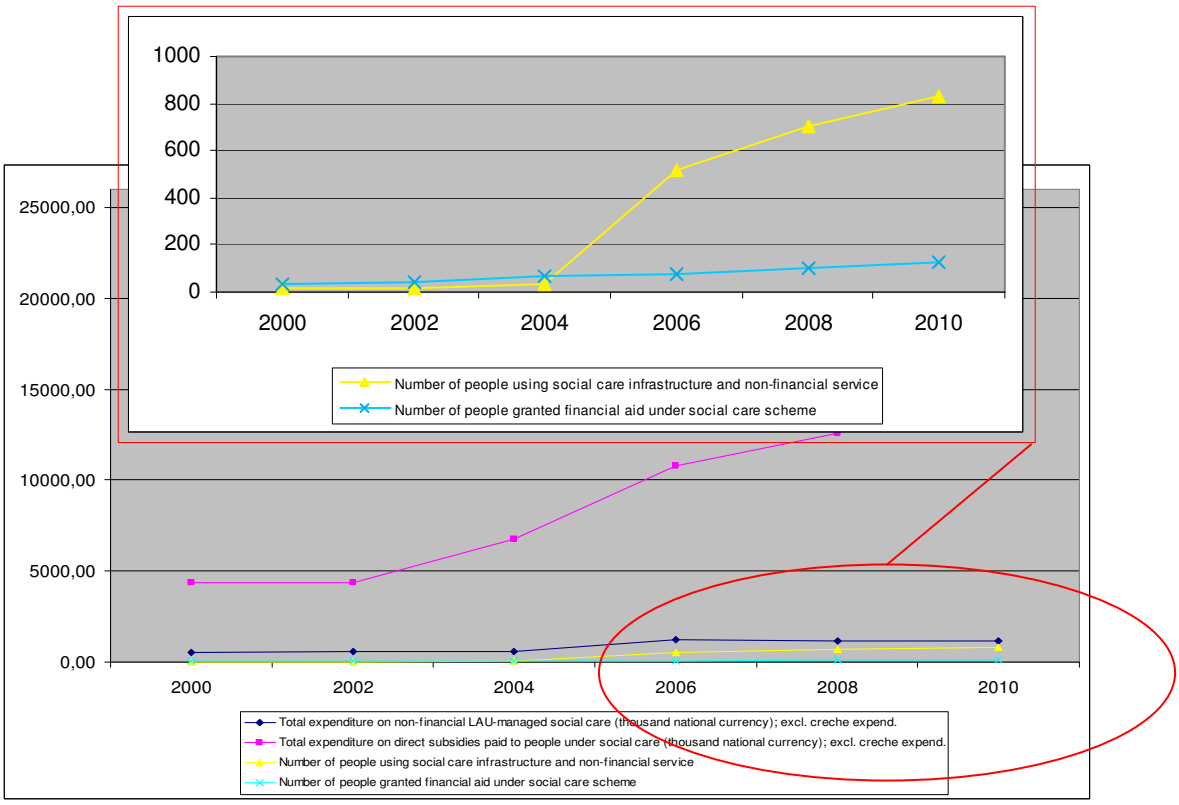
The average cost of social care per citizen is a proxy of how much every citizen would pay for the social care if the system was just purely locally financed. The value of average cost has changed significantly over the years and in 2010 it was 4 times more than in 2000. The last observed period 2008-2010 brought the highest increase by a 93% (from 955 EUR per citizen to 1850 EUR per citizen). The change is highly related to the amount spent on financial social care, with 100% national contribution.

The average cost per beneficiary of financial social care that describes the average cost of financial subsidies delivered to beneficiaries has been changing irregularly with an increase observed for the periods 2006-2008 (40%) and 2008-2010 (55%) and a decrease for the other year-to-year calculations (ranging from -6% to -25%).

The average cost of social care per beneficiary of social care infrastructure and non-financial service has gone down by a 72% over the 10 years. The year 2006 was reported as the highest nominal value decrease and it shows a 73% decline of the average costs of social care allocated per beneficiary. The rapid increase in the number of served beneficiaries is the reason of the change even if the spending was doubled at that time the decrease in average social can be clearly seen.

As seen in the graph (fig. xx) the decrease in the average cost is mainly related to a significant increase in number of people using social care infrastructure and non-financial service and does not reflect any real cost reductions.

Fig. XX. Expenditures on beneficiaries of social care in municipalities of Po Valley, Italy



Source: based on data gathered and delivered by National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation

There is no data on crèche/day nursery spending.

Social care: the cost-based indicators in Kozłów, Poland

The decisions taken in the field of social care are influenced by a number of factors including political and economic ones. There are also legal limitations resulting from the law on social welfare in force. The criteria of granting social aid are rarely reviewed, which results in decreasing number of those entitled. Kozłów is a small community with a substantial level of debt. Social care services are limited by insufficient coverage by community halls, activity clubs, day-care nursing centres, or canteens available for senior citizens. In addition, the community has no possibility of delivering meals to the elderly or disabled residents.

As far as economic factors are concerned, there is high unemployment rate among young people, who rarely try to improve their qualifications or find temporary jobs. In 2013, as much as 20% residents used different forms of social aid such as: welfare benefits, family allowance, or care allowance. However, local authorities are reluctant to direct public funds to

social care, whereas the preferred areas include investments such as road construction, which bring visible results thus securing voters' support. In turn, funding social care tends to be perceived as a waste of public money.

The community of Kozłów faces demographic changes with the society ageing as young residents migrate abroad or to the towns in search of a better life. Consequently, the share of the elderly rises causing an increase in potential social care beneficiaries. In the same time, the administrative unit is increasingly burdened with new tasks such as nursing homes and custody expenditures, which are not matched by additional funds.

Tab. XX. Cost-related variables: social care in Kozłów, Poland

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	5,155	5,075	4,971	5,001	4,977	4,868
Area (sq km)	86	86	86	86	86	86
Budget income per capita (PLN/person)	915,4	1066,28	1249,28	1629,37	1936,41	2329,43
Budget debt ratio (%)	NDA	NDA	NDA	16,11%	34,41%	57,20%
FINANCE						
Total expenditure on LAU-managed social care (thousand national currency); excl. creche expend.	NDA	513,52	413,26	NDA	NDA	NDA
Total investment expenditure on LAU-managed social care (thousand national currency); excl. creche expend.	NDA	NDA	NDA	NDA	NDA	NDA
Total maintenance and repair expenditure on LAU-managed social care (thousand national currency); excl. creche expend.	NDA	NDA	NDA	61,00	58,00	144,00
Total operational expenditure on LAU-managed social care (thousand national currency); excl. creche expend.	59,00	62,00	176,00	130.00	131,00	197,00
Total expenditure on direct subsidies paid to people under social care (thousand national currency); excl. creche expend.	348,00	272,00	210.00	465,00	225,00	304,00
Total expenditure on LAU-managed creche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	868,00
Total investment expenditure on LAU-managed creche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	98,00
Total maintenance and repair expenditure on LAU-managed creche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	426,00
Total operational expenditure on LAU-managed creche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	344,00
Subsidies granted to LAU on social care (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies granted to LAU on creche/day nursery (thousand national currency)	NDA	NDA	NDA	NDA	NDA	831,00
CUSTOMERS AND VOLUME						
Number of people using social care infrastructure and non-financial service (thousand persons)	179	95	160	170	290	75
Number of people granted financial aid under social care scheme (thousand persons)	888	619	476	413	319	557
Number of children in creche/day nursery (persons)	NDA	NDA	NDA	NDA	41	133
Number of places available in creche/day-nursery	NDA	NDA	NDA	NDA	NDA	75
Economically active population (thousand persons)	NDA	NDA	NDA	NDA	NDA	NDA
COST INDICATORS OF SERVICES AND INFRASTRUCTURE						

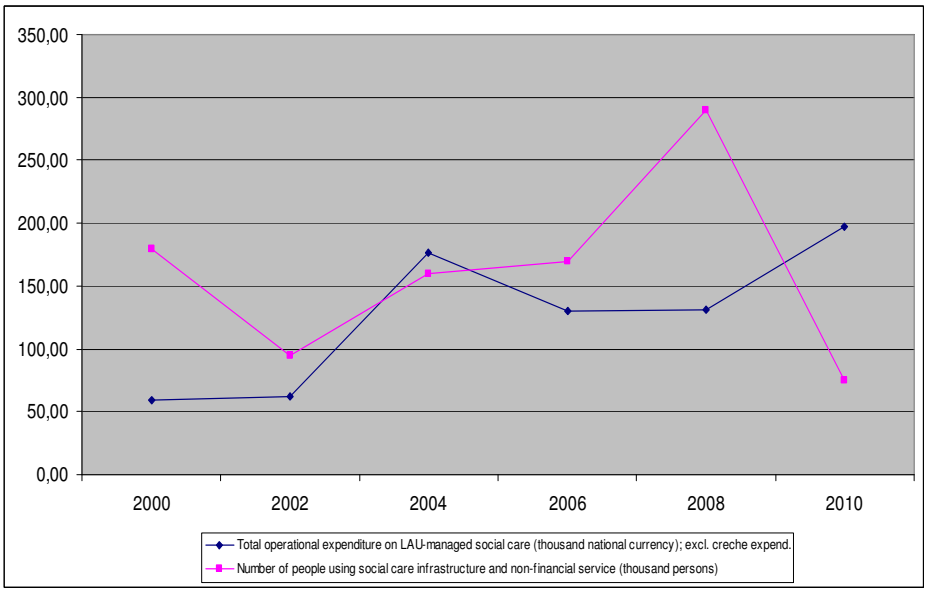
- SEE GLOSSARY OF INDICATORS (ANNEXED)						
Average cost of social care per beneficiary	NDA	0.72	0.65	NDA	NDA	NDA
Average cost of social care per citizen	NDA	101,19	83,13	NDA	NDA	NDA
Average aid cost per beneficiary of financial social care	0.39	0.44	0.44	1,13	0.71	0.55
Average cost of social care per beneficiary of social care infrastructure and non-financial service	0.33	0.65	1,10	1,12	0.65	4,55
Share of external social care subsidies in LAU total expenditure on social care	NDA	NDA	NDA	NDA	NDA	NDA
Average cost of creche/day nursery per kid	NDA	NDA	NDA	NDA	NDA	6,53
Vacancy rate of creche/day nursery service	NDA	NDA	NDA	NDA	NDA	1,77
Share of external creche subsidies in LAU total expenditure on creche/day nursery	NDA	NDA	NDA	NDA	NDA	0.96

Source: based on data gathered and delivered by The Małopolska Region

The data provided for social expenditure in Kozłów is incomplete and can only be a subject of preliminary and partial analysis. The average cost of social care per beneficiary as calculated based on the two observations i.e. 2002 and 2004 has slightly decreased. The change of the ratio in 2002-2004, is both a result of a raise in number of beneficiaries (68% increase over two years) as well as 20% decrease in the total funding on social care service.

Much more can be analysed in terms of operational expenditure on social care and expenditure on direct subsidies paid to people under social care. The operational cost of social care has increased in the years 2002-2004 and again in 2008-2010. The number of beneficiaries using social care non-financial services and infrastructure has been increasing over the years 2004-2008 and significantly fall down in 2010. The costs show rather different pattern, especially in 2006-2010. It may be a result of late payments not visible due to a two-year interval of observations.

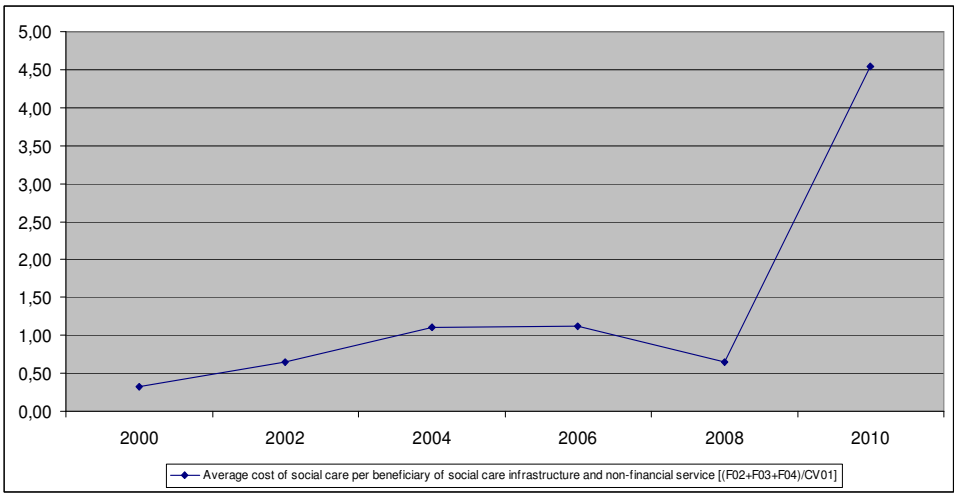
Fig. XX. Expenditures on beneficiaries of social care in Kozłów, Poland



Source: based on data gathered and delivered by The Małopolska Region

At the same time the average cost of social care per beneficiary of infrastructure and non-financial services has been increasing to show a highest value in 2010. The main reason is the decrease of number of beneficiaries. Unfortunately nothing can be said on the other cost categories such as repair and maintenance and investments. It is, therefore, hard to show general economic efficiency of the operations.

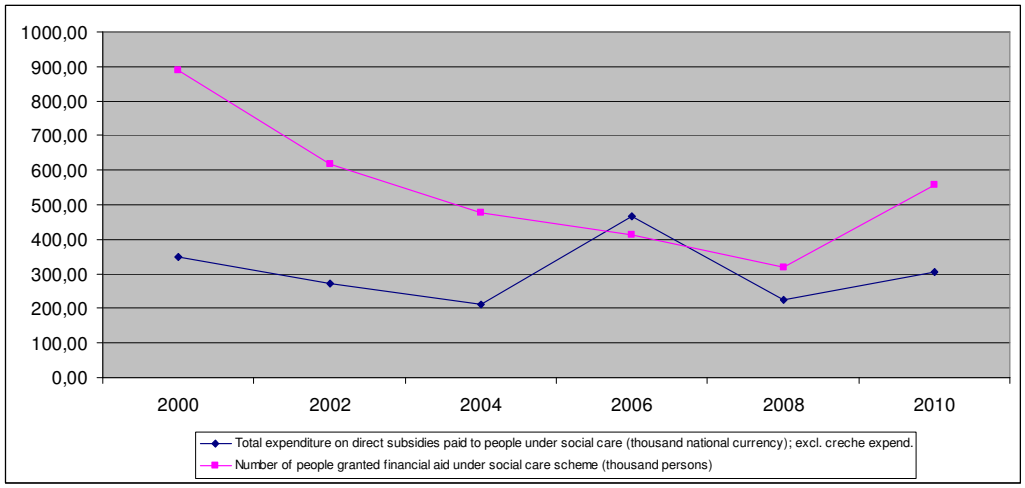
Fig. XX. Average cost of social care per beneficiary in Kozłów, Poland



Source: based on data gathered and delivered by The Małopolska Region

When it comes to direct subsidies there is a general falling tendency in both number of beneficiaries and the expenditure. Nevertheless, the year 2006 brought unexpectedly high expenditure over the decreasing number of subsidy-takers.

Fig. XX. Expenditures on beneficiaries of direct social care subsidies in Kozłów, Poland



Source: based on data gathered and delivered by The Małopolska Region

The total number of service-takers in 2010 as compared to 2000 has gone down by a 60% for non-financial and 37% for financial beneficiaries. At the same time the number of inhabitants fall down by 5,6% but for the years 2008 and 2010 there has been a significant increase in childcare service (crèche). With the aging population there is a shift over to more service to children, including the general social services.

Social care: conclusions

Social care services show similar pattern in the studied cases. Kozłów case is limited in data and thus cannot be taken for the observations. In general, the average cost per beneficiary rises, however, the Italian average cost has increased in term of financial social care and decreased in terms of non-financial social-care. For the Hungarian case the increase is present for both types of aid. The financial social care aid in Italy makes the share of subsidies donated nationally very high and the value does not show a falling tendency as in Hungarian case.

Social care service seems to be the most vulnerable service to demographic changes. Sudden changes to social structures directly rise expectations towards service delivery (more crèche, shelters, subsidies paid, etc.) In other words, the increase in demand directly calls for an increase in supply. In many other types of services demographic change generates a need for efficiency and cuts in spending. For social care services, the situation is to the opposite, more spending is needed based on the needs of an aging population or increased demand for social care for children. At the same time, it may be worth to notice that social care infrastructure usually does not generate high fixed costs in the system.

Health care: the cost-based indicators in Jászárokszállás, Hungary

Policy is not concerned seriously by the stakeholders of the examined town, only compulsory national legal frameworks are taken seriously into account but no real political actions can be found in the background of local decisions linked to health services. The decisions of local people are expressing local needs. However these decisions are significantly driven by economy. Decisions of local stakeholders concerning health care need to follow demographic changes. The negative process is more related to the fact that the local population is ageing. According to the ageing population of the territory as well as the demands of newcomers (focusing more on regular screenings, prevention, etc.) a more diversified health care service is needed in the town. This includes local in-patient care possibility.

The supply of services is linked more to upgrading quantity. The number of patients is increasing. Qualitative improvement could be possible on condition the number of patients per practice has been cut by half.

Tab. XX. Cost-related variables: health care in Jászárokszállás, Hungary

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	8,461	8,379	8,312	8,252	8,228	8,124
Area (sq km)	77,17	77,17	77,17	77,17	77,17	77,17
Budget income per capita (EUR/person)	NDA	NDA	NDA	NDA	NDA	NDA
Budget debt ratio (%)	3,2	3,0	0.2	4,3	9,4	9,8
FINANCE						
Total operators' expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)	22532	17483	2303	7334	4881	3066
Operators' investment expenditure (doctors, first-aid medical services) on health care in LAU	NDA	NDA	NDA	NDA	NDA	NDA

Data	2000	2002	2004	2006	2008	2010
(thousand national currency)						
Operators' maintenance and repair expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' operational expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total operators' expenditure (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' investment expenditure (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' maintenance and repair expenditure (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' operational expenditure (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' "market" revenues (doctors, first-aid medical services) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' "market" revenues (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies granted by national health system to (doctors, first-aid medical services) operators on health care (thousand national currency)	19899	12586	826	5648	1315	715
Subsidies granted by national health system to (hospitals) operators on health care (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies granted by LAU to (doctors, first-aid medical services) operators on health care (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies granted by LAU to (hospitals) operators on health care (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
CUSTOMERS AND VOLUME						
Number of patients using doctors/first-aid medical services (thousand persons)	50.105	49,279	54,256	52,167	51,376	56,273
Number of patients in hospitals (thousand persons)	NDA	NDA	NDA	NDA	NDA	NDA
Number of doctors in first-aid medical services (persons)	4	5	5	4	5	4
Number of beds in hospitals (units)	NDA	NDA	NDA	NDA	NDA	NDA
Deaths (persons)	107	111	119	139	116	111
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Average total cost of doctors/first-aid medical services per patient	449,70	354,78	42,45	140.59	95,01	54,48
Average total cost of hospitals services per patient	NDA	NDA	NDA	NDA	NDA	NDA
Average total cost of doctors/first-aid medical services per citizen	2663,04	2086,53	277,07	888,75	593,22	377,40
Average total cost of hospitals services per citizen	NDA	NDA	NDA	NDA	NDA	NDA
Average investment cost of doctors/first-aid medical services per citizen	NDA	NDA	NDA	NDA	NDA	NDA
Average investment cost of hospitals services	NDA	NDA	NDA	NDA	NDA	NDA

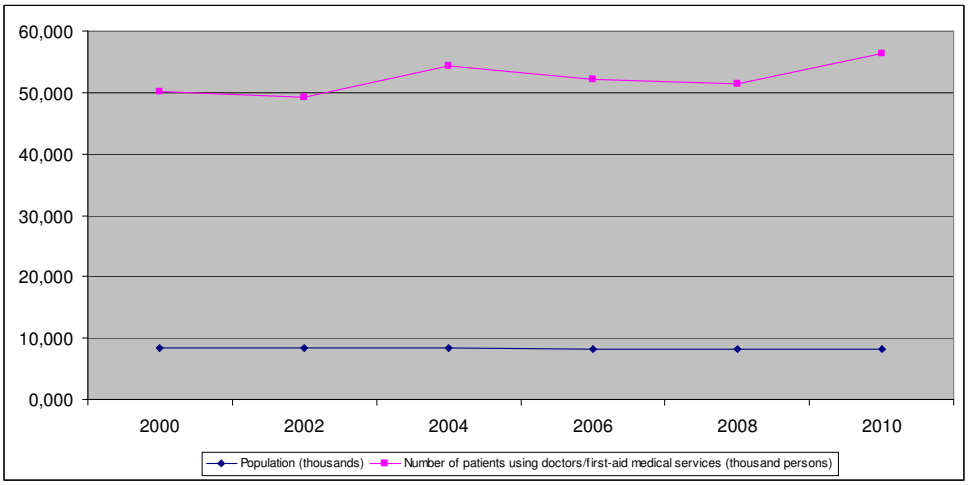
Data	2000	2002	2004	2006	2008	2010
per citizen						
Average maintenance, repair and operational costs of doctors/first-aid medical services per patient	NDA	NDA	NDA	NDA	NDA	NDA
Average maintenance, repair and operational costs of hospital services per patient	NDA	NDA	NDA	NDA	NDA	NDA
Share of operators' investment expenditure in operators' total expenditure (doctors, first-aid medical services) on health care in LAU	NDA	NDA	NDA	NDA	NDA	NDA
Share of operators' investment expenditure in operators' total expenditure (hospitals) on health care in LAU	NDA	NDA	NDA	NDA	NDA	NDA
Share of all subsidies granted to operators on health care (doctors, first-aid medical services) in total operators' expenditure	0.88	0.72	0.36	0.77	0.27	0.23
Share of all subsidies granted to operators on health care (hospitals) in total operators' expenditure	NDA	NDA	NDA	NDA	NDA	NDA
Number of citizens per doctor in first-aid medical services (thousands/doctor)	2,12	1,68	1,66	2,06	1,65	2,03
Number of citizens per bed in hospitals (thousands/bed)	NDA	NDA	NDA	NDA	NDA	NDA

Source: based on data gathered and delivered by Észak-alföld Regional Development Agency Non-profit Ltd

The average cost of overall non-specialist doctors/first-aid medical services delivered to patients has fallen down over the 10 years. There has been a radical decrease in 2004 and 2010 but there has also been an one-time increase in 2006. There is, however, not enough detailed data to comment upon the economic background for the specifics of average cost. It may be the change of maintenance costs, operational spending or investments that make such patterns. It is neither related to the number of citizens nor to number of doctors.

The average cost of doctors/first-aid medical service for community has also fallen down with more or less similar trend as for total cost per patient. Taking into consideration the number of patients and citizens, the statistics shown in the graph illustrate the patterns – more patients per year in 2004 and 2010 and a slight depopulation over the whole period.

Fig. XX. Population and participation in health care in Jászárokszállás, Hungary



Source: based on data gathered and delivered by Észak-alföld Regional Development Agency Non-profit Ltd

The level of public aid intensity in doctors/first-aid services, described by a share of all subsidies granted to operators on health care (doctors, first-aid medical services) in total operators' expenditure ratio, has decreased over the 10 years by an average of more than 40% - cuts per 2-year periods. There is just one year (2006) with a 200 increase in donations as compared to 2004. Anyway, the nominal values show a massive scale of decrease – with a 90% of subsidised financing in 2000 and only 23% in 2010. Since the number of patients rose systematically and the total expenditure decreased (being even more depreciated by cumulated inflation over 2001-2010 ranging 72%), we can expect that there is a problem of limited financing with an increasing demand for the service.

Health care: the cost-based indicators in Kozłów, Poland

The service provision is mostly driven by economic factors. There is a general pressure to cut costs and the funds received, both local and from the state, are insufficient. This combined with increased costs of treatment resulting from society ageing leads to financial problems. Therefore, there is little possibility to develop services and achieve better treatment quality. In addition, in the face of scarce renovation and modernisation funds, it is even more difficult to improve the infrastructure necessary for healthcare provision.

Tab. XX. Cost-related variables: health care in Kozłów, Poland

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	5,155	5,075	4,971	5,001	4,977	4,868
Area (sq km)	86	86	86	86	86	86
Budget income per capita (PLN/person)	915,4	1066,28	1249,28	1629,37	1936,41	2329,43
Budget debt ratio (%)	0.00%	0.00%	0.00%	16,11%	34,41%	57,20%
FINANCE						
Total operators' expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	1812	1816
Operators' investment expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' maintenance and repair expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	915	924
Operators' operational expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	897	892
Total operators' expenditure (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' investment expenditure (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' maintenance and repair expenditure (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' operational expenditure (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' "market" revenues (doctors, first-aid medical services) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' "market" revenues (hospitals) on health care in LAU (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies granted by national health system to (doctors, first-aid medical services) operators on health care (thousand national currency)	NDA	NDA	NDA	NDA	897	892
Subsidies granted by national health system to (hospitals) operators on health care (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies granted by LAU to (doctors, first-aid medical services) operators on health care (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies granted by LAU to (hospitals) operators on health care (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
CUSTOMERS AND VOLUME						
Number of patients using doctors/first-aid medical services (thousand persons)	NDA	NDA	NDA	NDA	4100	3970
Number of patients in hospitals (thousand persons)	NDA	NDA	NDA	NDA	NDA	NDA
Number of doctors in first-aid medical services (persons)	NDA	NDA	NDA	NDA	3	3
Number of beds in hospitals (units)	NDA	NDA	NDA	NDA	NDA	NDA
Deaths (persons)	NDA	NDA	NDA	NDA	NDA	NDA
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Average total cost of doctors/first-aid medical services per patient	NDA	NDA	NDA	NDA	44,20%	45,74%
Average total cost of hospitals services per patient	NDA	NDA	NDA	NDA	NDA	NDA
Average total cost of doctors/first-aid medical services per citizen	NDA	NDA	NDA	NDA	364,07	373,05
Average total cost of hospitals services per citizen	NDA	NDA	NDA	NDA	NDA	NDA
Average investment cost of doctors/first-aid medical services per citizen	NDA	NDA	NDA	NDA	NDA	NDA
Average investment cost of hospitals services per citizen	NDA	NDA	NDA	NDA	0.44	0.46
Average maintenance, repair and operational costs of	NDA	NDA	NDA	NDA	0.44	0.46

doctors/first-aid medical services per patient						
Average maintenance, repair and operational costs of hospital services per patient	NDA	NDA	NDA	NDA	NDA	NDA
Share of operators' investment expenditure in operators' total expenditure (doctors, first-aid medical services) on health care in LAU	NDA	NDA	NDA	NDA	NDA	NDA
Share of operators' investment expenditure in operators' total expenditure (hospitals) on health care in LAU	NDA	NDA	NDA	NDA	NDA	NDA
Share of all subsidies granted to operators on health care (doctors, first-aid medical services) in total operators' expenditure	NDA	NDA	NDA	NDA	0.50	0.49
Share of all subsidies granted to operators on health care (hospitals) in total operators' expenditure	NDA	NDA	NDA	NDA	NDA	NDA
Number of citizens per doctor in first-aid medical services (thousands/doctor)	NDA	NDA	NDA	NDA	1,66	1,62
Number of citizens per bed in hospitals (thousands/bed)	NDA	NDA	NDA	NDA	NDA	NDA

Source: based on data gathered and delivered by The Małopolska Region

The data provided for the field study in Kozłów offers a limited possibility to analyse the changes over time. The 2008 and 2010 data therefore is only analysed in the case, with no guarantee to be a representative value and description of any time pattern. When it comes to an average cost of doctors/first-aid medical services per patient, the average cost of non-specialist doctors/first-aid medical services delivered to patients has increased by a 3,5%. At the same time the inflation amounted approx. 10%. The total expenditure, at the time rose by a 0.2% and therefore the ratio change is just a result of reduced number of beneficiaries (a 3% decrease versus a 2% decrease of population in 2008-2010).

The cost categories reported in 2008-2010 period grew by 1% in terms of operator's maintenance costs and decreased by 0.6% in operational costs. The last value is the same when to comes to subsidies granted by national health system. The subsidy for operations has decreased by 1% from a half of total expenditure to set a 49% in 2010.

Health care: conclusions

Due to limited data and observations for Kozłów, little can be compared with regards to health care costs over the services in selected cases.

Anyway, the demographic elasticity of supply in health care services and infrastructure is higher as compared to any network infrastructure-based services .It is relatively easy to cumulate the service in one place and therefore the fixed cost can be shared between many users. Also, adapting the supply of certain health care services to the number of customers can be easily done in most of the cases. The other general issue observed is the common pressure to control the excessive state expenditure on health care. That is, basically, related to

economic situation and not linked to demography. In that case, service quality and service supply are mainly impacted by the state policy. That should not be seen as pro-effective activities but cuts in spending.

Housing: the cost-based indicators in Katowice, Poland

The decisions taken on housing are based on policy and economy. For policy, it is the internal task of municipality to take care of public housing economy in the respective territorial unit. Therefore, any politician in charge of a municipality takes responsibility of the supply of social and non-social public housing. For the economics of public housing, the costs generated by the service and its infrastructure are probably never compensated by the revenues. Thus, the main objective in terms of public housing economics is to optimise the service offered so as to generate a minimum of loss and a maximum of social benefit.

The strategy of Katowice public housing development 2010-2020 sets up three goals:

- creation of conditions for the development of housing construction carried out by developers, real estate communities, civic building communities as well as private investors,
- rational economy of public housing stock,
- upgrading of the quality of living.

Therefore, we can expect that the supply of houses is generated by investments of various types, including private and public delivery. As a rule, majority of investments should be provided on a market basis. The city, as an organiser of public housing market, should concentrate on optimisation of the stock and pay attention to the poorest citizens and their living conditions, that is by law a task of any single community. The optimisation may include:

- the changes in tenancy of municipality owned houses to increase in time the number of tenants per house,
- reduction of costs regarding the relocation of tenants who fall into social public housing based on their status (there is a change of status instead of changes of place),
- matching the public housing service to age (70+ programme),
- reduction of operational costs of social public housing by leasing the houses from other housing managers and owners,
- reduction of unpaid liabilities, especially coming from tenants whose economic situation does not show critical status.

Referring to 2000-2010 period, it must be noted that the municipality actively managed its housing property stock and as such several dwellings have been "privatised" or structural changes were applied. For this reason, the overall burden for the city related to housing has been reduced.

Tab. XX. Cost-related variables: housing in Katowice, Poland

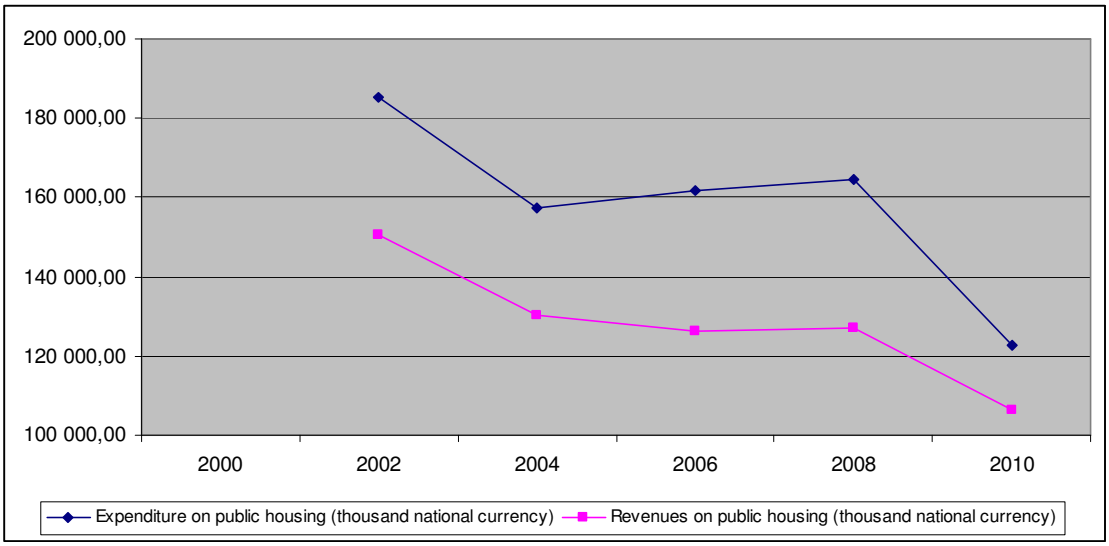
Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	330 625	325 045	319 904	314 500	309 621	311 421
Area (sq km)	164	164	164	165	165	165
Budget income per capita (EUR/person)	NDA	NDA	NDA	NDA	NDA	NDA
Budget debt ratio (%)	NDA	NDA	NDA	NDA	NDA	NDA
FINANCE						
Expenditure on public housing (thousand national currency)	NDA	185 252,00	157 519,00	161 871,00	164 704,00	122 576,00
Expenditure on social public housing (thousand national currency)	NDA	NDA	NDA	NDA	26,74	43,37
Expenditure on non-social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Revenues on public housing (thousand national currency)	NDA	150 754,00	130 123,00	126 339,00	127 215,00	106 204,00
Revenues on social public housing (thousand national currency)	NDA	NDA	NDA	NDA	189,20	180.12
Revenues on non-social public housing (thousand national currency)	NDA	NDA	NDA	NDA	127 025,70	106 023,88
Operational costs on public housing (thousand national currency)	NDA	180 960.00	140 087,00	140 436,00	128 339,00	113 508,00
Operational costs on social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operational costs on non-social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Repair and maintenance cost in public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
CUSTOMERS AND VOLUME						
Number of people living in public housing (person)	44685	43571	42057	41642	41171	40308
Number of people living in social public housing	NDA	NDA	NDA	NDA	NDA	1564
Number of people living in non-social public housing	NDA	NDA	NDA	NDA	NDA	38744
Total square meters of public housing (thousand sq m)	946,14	919,72	904,98	903,55	945,55	895,74
Total square meters of social public housing (thousand sq m)	NDA	NDA	NDA	NDA	NDA	16,73
Total square meters of non-social public housing (thousand sq m)	NDA	NDA	NDA	NDA	NDA	879,01
Vacancy rate in public housing (%)	2,60%	3,08%	4,22%	4,62%	4,90%	6,06%
Vacancy rate in social public housing (%)	NDA	NDA	NDA	NDA	NDA	NDA
Vacancy rate in non-social public housing (%)	NDA	NDA	NDA	NDA	NDA	NDA
Individual building permits per 10000 inhabitants	0.49	0.2	0.59	0.45	0.7	0.61
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						

Data	2000	2002	2004	2006	2008	2010
Return on public housing	NDA	-22,88%	-21,05%	-28,12%	-29,47%	-15,42%
Return on social public housing	NDA	NDA	NDA	NDA	0.86	0.76
Return on non-social public housing	NDA	NDA	NDA	NDA	NDA	NDA
Operational costs on public housing (thousand national currency) per square meters	NDA	196,76	154,80	155,43	135,73	126,72
Operational costs on social public housing (thousand national currency) per square meters	NDA	NDA	NDA	NDA	NDA	NDA
Operational costs on non-social public housing (thousand national currency) per square meters	NDA	NDA	NDA	NDA	NDA	NDA
Share of people living in public housing to general population per 1000 inhabitants	0.14	0.13	0.13	0.13	0.13	0.13
Share of people living in social public housing to general population per 1000 inhabitants	NDA	NDA	NDA	NDA	NDA	0.01
Share of people living in non-social public housing to general population per 1000 inhabitants	NDA	NDA	NDA	NDA	NDA	0.12

Source: based on data gathered and delivered by University of Economics in Katowice

Return on public housing that describes the level of profitability or deficit in financing of social and non-social public housing has been falling down in since 2002 (there is no data for 2000). The return on public housing decreased during the 8 years by a third and in nominal values showed a -23% in 2002 and -15% in 2010 (it should be mentioned that the years 2006 and 2008 generated even higher loss in public housing, respectively showing -28% and -29%). The expenditure, as compared to preceding year of observation showed a decrease in 2004 and 2010 and an increase in 2006 and 2008. At the same time we can observe a reduction of revenues during the whole period apart from 2008 with a slight surplus of 0.7% as compared to 2006 (Fig. XX). The inflation has increased over the 10 years to reach 32%.

Fig XX. Return on public housing in Katowice – basic variables



Source: based on data gathered and delivered by University of Economics in Katowice

The loss in public housing is neither stopped by the decreasing number of people living in the houses nor is it the reduced square meters value. The decrease of people living in houses equals more or less a 2% per annum and in total generated a reduction of 10% (4,3 thousand people).

The number of square meters of public housing went down by a total of 7% in the 8 years and it showed a reduction of a median of 1,6% per annum. It is only the 2006-2008 period that brought an increase of square meters of public housing offered to citizens.

There might be a case that the vacancy rate going up over the years generates costs with a lack of revenues, making the profitability or break-even point unreachable. More likely it is the social public housing that generates a huge loss only partly compensated by the non-social housing revenues. However, there is no data on social housing apart from data regarding the year 2010.

The operational costs per sq. meter show a falling trend over the years and they were reduced by a 36% in the 8 years time. At the same time, the cumulated inflation showed 18%. The biggest reduction can be seen over the 2002-2004 period and it was a significant decrease of 23%. The year 2006 as compared to 2004 showed a slight increase in operation costs (0.25%) and the 2008 and 2010 as compared to previous observations generated a reduction of 8 and 11%.

There is no report on repair and maintenance costs that unfortunately makes the whole picture incomplete.

Housing: the cost-based indicators in Ljubljana, Slovenia

The provision of public housing in Ljubljana is mainly driven by housing legislation and national housing programme. The decisions taken on own housing developments are based on policy and economy. Ljubljana has high free market prices for housing units and high rents. Therefore high demand for non-profit and social housing is not surprising for authorities. Number of applications for a tenders for social or non-profit housing rental call of the Public Housing Fund of the Municipality of Ljubljana significantly exceeds the supply. Only 8-10% of the applications are solved positive each year. The costs generated by the providing the housing is not compensated by the revenues. The prices for available land for new housing development are high and investments are low due to long process of obtaining building permission and the market is unstable.

Public Housing Fund of the Municipality of Ljubljana supports and finance housing with uniform building standards also for depriviledged groups. Lack of financial resources in public housing supply in Ljubljana does not reduce the quality housing standards. Recently the passive energy housing projects were implemented to reduce the energy costs for low-income inhabitants.

Tab. XX. Cost-related variables: housing in Ljubljana, Slovenia

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	270.986	265,881	267,440	267,369	272,770	280.100
Area (sq km)	275	275	275	275	275	275
Budget income per capita (EUR/person)	987,27	1210.85	1326,15	1448,57	1663,43	1766,09
Budget debt ratio (%)	NDA	NDA	NDA	NDA	NDA	NDA
FINANCE						
Expenditure on public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Expenditure on social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Expenditure on non-social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Revenues on public housing (thousand national currency)	NDA	NDA	NDA	825910.00	4415102,00	5497935,00
Revenues on social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Revenues on non-social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operational costs on public housing (thousand national currency)	NDA	NDA	NDA	369028,00	1708252,00	1946514,00
Operational costs on social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operational costs on non-social public housing (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA

Data	2000	2002	2004	2006	2008	2010
Repair and maintenance cost in public housing (thousand national currency)	NDA	NDA	NDA	1677537,00	38322125,00	12752723,00
CUSTOMERS AND VOLUME						
Number of people living in public housing (person)	NDA	NDA	11470	11358	11588	13164
Number of people living in social public housing	NDA	NDA	NDA	NDA	NDA	NDA
Number of people living in non-social public housing	NDA	NDA	11470	11358	11588	13164
Total square meters of public housing (thousand sq m)	NDA	NDA	1840.00	1817,00	1845,00	2120.00
Total square meters of social public housing (thousand sq m)	NDA	NDA	NDA	NDA	NDA	NDA
Total square meters of non-social public housing (thousand sq m)	NDA	NDA	NDA	1817,00	1845,00	2120.00
Vacancy rate in public housing (%)	NDA	NDA	NDA	NDA	NDA	NDA
Vacancy rate in social public housing (%)	NDA	NDA	NDA	NDA	NDA	NDA
Vacancy rate in non-social public housing (%)	NDA	NDA	NDA	NDA	NDA	NDA
Individual building permits per 10000 inhabitants	5,68	6,27	7,90	10.29	5,50	3,32
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Return on public housing	NDA	NDA	NDA	NDA	NDA	NDA
Return on social public housing	NDA	NDA	NDA	NDA	NDA	NDA
Return on non-social public housing	NDA	NDA	NDA	NDA	NDA	NDA
Operational costs on public housing (thousand national currency) per square meters	NDA	NDA	NDA	203,10	925,88	918,17
Operational costs on social public housing (thousand national currency) per square meters [F08/CV05]	NDA	NDA	NDA	NDA	NDA	NDA
Operational costs on non-social public housing (thousand national currency) per square meters	NDA	NDA	NDA	NDA	NDA	NDA
Share of people living in public housing to general population per 1000 inhabitants	NDA	NDA	0.04	0.04	0.04	0.05
Share of people living in social public housing to general population per 1000 inhabitants	NDA	NDA	NDA	NDA	NDA	NDA
Share of people living in non-social public housing to general population per 1000 inhabitants	NDA	NDA	0.04	0.04	0.04	0.05

Source: based on data gathered and delivered by Urban Planning Institute of the Republic of Slovenia

The data for Slovenian public housing is rather limited over time and several characteristics. Due to missing data on expenditure, the return on public housing cannot be calculated.

The data on people living in public housing is provided for 2004-2010. The total change in number of beneficiaries of public housing heads up for a 15% with the biggest growth over the 2008-2010 period. At the same time, the number of square meters of houses goes up and exceeds in total a 16% value with the biggest change over 2008-2010 (nearly 15%). The

number of inhabitants grows up constantly to reach a max. of 280 thousand people, starting from a 271 thousand in 2000. At the same time, the permits for individual building shows a down-curved pattern with a growth up till 2006 and a slow down (decrease) after that.

Housing: the cost-based indicators in Vejprty, the Czech Republic

The decisions are driven equally by policy and by economy. The municipality tries to look to the future and predict future trends. Therefore it took part in many projects according to demographic changes and especially social projects. The municipality also cooperates with its neighbour – German municipality Barenstein. It also decided not to sell public flats and rent them and therefore control the structure of inhabitants. It is maybe demanding for the municipality but there is another reason and moreover experiences from other near municipalities which have problems with socially inadaptable inhabitants. Some of the sold building with public flats in this region changed to ghettos. The municipal council has to also behave economically and could not subsidy the housing.

There is at present about 40 free flats in the ownership of the municipality. According to demographic changes in the town there is big probability of more free flats in future. Living in public housing is affordable and the municipality regularly invest to improving quality of public buildings. The municipality also invested to dividing of bigger flats because of bigger demand for smaller flats with lower rents and costs. There are also economic factors because the municipality has no financial means to subsidize public housing. All revenues from flats mainly from rents are invested in public housing.

Tab. XX. Cost-related variables: housing in Vejprty, The Czech Republic

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	3,40	3,31	3,27	3,26	3,28	3,30
Area (sq km)	9,77	9,77	9,77	9,77	9,77	9,77
Budget income per capita (EUR/person)	16477,00	23503,00	31869,00	31144,00	18959,00	27316,00
Budget debt ratio (%)	10.34%	8,42%	6,35%	3,64%	3,39%	10.96%
FINANCE						
Expenditure on public housing (thousand national currency)	17879,00	19066,00	20174,00	23637,00	28323,00	23037,00
Revenues on public housing (thousand national currency)	6620.00	7042,00	7145,00	6431,00	9946,00	9608,00
Operational costs on public housing (thousand national currency)	11285,00	12675,00	13411,00	16092,00	18364,00	19598,00
Repair and maintenance cost in public housing (thousand national currency)	1994,00	2608,00	3929,00	1939,00	6057,00	1861,00
CUSTOMERS AND VOLUME						

Data	2000	2002	2004	2006	2008	2010
Number of people living in public housing (person)	NA	1611	1581	1532	1490	1405
Total square meters of public housing (thousand sq m)	NA	532,64	535,44	535,56	536,02	538,06
Vacancy rate in public housing (%)	8,10%	8,80%	8,60%	10.60%	9,50%	12,50%
Individual building permits per 10000 inhabitants	0.0063	0.0038	0.003	0.0113	0.0023	0.0042
Return on public housing	-62,97%	-63,07%	-64,58%	-72,79%	-64,88%	-58,29%
Operational costs on public housing (thousand national currency) per square meters	NA	23,80	25,05	30.05	34,26	36,42
Share of people living in public housing to general population per 1000 inhabitants	NA	0.49	0.48	0.47	0.45	0.43

Source: based on data gathered and delivered by Institute of Sociology of the Academy of Sciences of the Czech Republic

The data on revenues on public housing over the 10 years show in general negative value with a tendency of increased "loss" up to 2006 and a slight change reducing the minus values. The inflation cumulated over the 10-year period ranged up to 25%. If we read the table, the main factor behind the high "loss" is due to the operational costs. Operational costs rose during the whole period with a peak in 2006 (20% as compared to 2004) and reach a 6,7% in 2010 as compared to 2008. Repair and maintenance costs changed very irregularly with a highest value change on the turn of 2006-2008 (212%). The values for 2004-2006 and 2008-2010 show a slowdown in repair and maintenance with a -50% and -70%.

The share of people living in public housing to general population changed over time and reached approx. 43% in 2010 whereas in 2002 half of the citizens lived in public housing. The number of square meters of public housing shows a slight increase (1%) and at the same time the number of individual building permits was reduced by a third with the only one value that showed a positive change (2006).

Housing: conclusions

Due to limited data and incomparable observations for the exemplary cases, little can be compared with regards to housing costs over the services in selected cases.

Territories with a significant (dominating) share of public housing are much more vulnerable to the economic consequences of depopulation processes. For privately owned property, market rules apply and decisions as well as consequences impact the owner (individual) and are much more dispersed among the community. The more the housing relies upon the public sector and its ownership, the more demographic changes affect economic stability of local authorities. On the other hand, "cumulated" ownership allows easier facility management including relocation of tenets, deactivation of blocks of flats and other adaptation processes. The public housing sector may use mechanisms of selective

privatisation (single flat, single house) that is not possible in case of network infrastructure (e.g. with a part of road or water pipeline). In other words, the loss of revenue due to increased vacancy rate may be partly compensated on revenues based on selling dwellings to the market as an alternative to transferring the growing costs onto the remaining tenants.

3.3.2. Case studies in the economics of network services and their infrastructure

Public transport: the cost-based indicators in Vejprty-Kadan, the Czech Republic

Due to system of financing, public transport services in the Usti region and therefore in the Vejprty - Kadan area, suburban and intercity transport (excluding city transport) is mainly ordered and financed from the budget of the Ustí Region. This issue is solved trough Department of Transport and Road Management – Authority of Usti region. It solves the problem of public transport through the Department of Transport and Road Management. Public transport is solved on the basis of the population's needs and requirements in local authorities (local and municipal authorities). It must, however, be factual and realistic requirements in accordance with the concept of public transport within the approved budget of the region. Each request is solved individually. Reducing transport service is based on the identified low number of passengers. On the contrary, strengthen the traffic is based on the constructive requirements of local authorities with the development of new industrial zones at the current times, etc. Since 2007, the public transport in the region is under renovation by gradually optimizations timetables, which were outdated and based on the needs of citizens in times past. Transport is significantly affected in terms of demographics. Since the beginning of the 90 years decreasing the number of living permanently residents in many municipalities. This reduces the demand for transport.

Offered services in passenger transport ordered by Ustí Region are a compromise of available financial resources and the achievement of an ideal public transport system. For the best results, it is important to establish quality standards that are set out in the already mentioned Plan transport services of Ustí region, which is made up during 5 years. The aim is to provide the best transport connections in exposed parts of days and weeks at intervals of at least 60 minutes. It succeeded for now only on the main railway lines connecting the largest cities in the region (with min. 20 thousand. inhabitants). Between 2013 and 2014 Usti Region make tender for new bus operators with beginning of new contracts from 1.1 2015 Public competition can reduce cost per ordered kilometre and save money for order any other of

transport services. Number of connections in the area depends on the traffic demand from passengers.

Tab. XX. Cost-related variables: public transportation in municipalities of Vejprty-Kadan, the Czech Republic

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	5,11	4,95	4,84	4,83	4,83	4,85
Area (sq km)	132,79	132,79	132,79	132,79	132,79	132,79
Budget income per capita (EUR/person)	6070.80	6734,40	7586,40	8395,20	9565,20	10142,40
Budget debt ratio (%)	-1,54%	1,76%	-6,13%	3,89%	16,64%	2,74%
FINANCE						
Total operators' expenditure on public transport - buses, trams (thousand national currency)	NDA	NDA	NDA	NDA	18730.80	19688,72
Total operators' revenues on public transport - buses, trams (thousand national currency)	NDA	NDA	NDA	NDA	5314,85	5442,33
Operators' revenues on core service sold - revenue on tickets in buses, trams (thousand national currency)	NDA	NDA	NDA	NDA	5314,85	5442,33
Operators' investment expenditure on public transport - buses, trams (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' operational expenditure on public transport - buses, trams (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' repair and maintenance expenditure in public transport - buses, trams (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Subsidies of LAU local government to public transport system - buses, trams (thousand national currency)	NDA	NDA	NDA	NDA	13415,95	14246,39
CUSTOMERS AND VOLUME						
Number of passengers in buses, trams per year (person)	NDA	NDA	NDA	NDA	367229	406033
Distance travelled by means of transportation - buses, trams (km)	NDA	NDA	NDA	NDA	578647,00	566582,00
Length of public transport - buses, trams - lines (km)	NDA	NDA	NDA	NDA	147,00	141,00
Number of buses and trams (units)	NDA	NDA	NDA	NDA	13,00	12,00
Capacity of means of public transportation - buses, trams (person)	NDA	NDA	NDA	NDA	1011,00	937,00
Average age of means of public transportation - buses, trams (years)	NDA	NDA	NDA	NDA	6	7
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Return on public transport	NDA	NDA	NDA	NDA	-252,42%	-261,77%
Return on service sold	NDA	NDA	NDA	NDA	-252,42%	-261,77%
Cost of public transportation per km	NDA	NDA	NDA	NDA	0.032	0.035
Share of investment costs in total expenditure	NDA	NDA	NDA	NDA	NDA	NDA
Share of operational costs in total expenditure	NDA	NDA	NDA	NDA	NDA	NDA
Share of repair and maintenance costs in total	NDA	NDA	NDA	NDA	NDA	NDA

Data	2000	2002	2004	2006	2008	2010
expenditure						
Share of subsidies in total revenues	NDA	NDA	NDA	NDA	2,52	2,62
Intensity of public transport lines use	NDA	NDA	NDA	NDA	3936,37	4018,31

Source: based on data gathered and delivered by Regional Authority of Usti Region

According to information provided for 2008 and 2010. the return on public transport shows a financial loss. In 2008, the indicator was at the level of – 252% and in 2010 it reached – 262%. In other words, each 1 CSK spent on public transportation generated more than 2 CSK of loss, to be covered by public subsidy. The other related indicator – return on service sold – is according to the data the same as return on public transportation. The return is only based on transportation and this the core service.

Based on the limited number of observations available, it is rather impossible to judge on the relation of return on public transport and other changes of demand variables. Theoretically, the observed growth in number of passengers related to relatively lower growth of operator's costs means lower cost per capita in a given period. In other words, one may assume that fixed costs maintain on a relatively high level.

Even though, the total amount of kilometres travelled by buses has gone down, the average cost per kilometre is slightly higher in the observed 2008-2010 period. The difference is only 3 CSK per km and is a result of increase in total expenditure by 5 % and decrease in total amount of travelled km by 2%.

Since there is no data on specific amounts of costs regarding investments, maintenance and repair and operation, it is neither possible to analyse the economic indicators for the cost side of the service in Vejprty nor decide on their relation to transportation fleet, distance travelled and number of passengers.

The share of subsidies in total revenues that describes the level of public intervention towards public transportation in Vejprty has been growing in 2008-2010 period and it equals 2,52 and 2,62. In other words, 72% of expenditure has been annually covered by subsidies. The loss is covered by subsidies up to full amount.

The data for 2008-2010 shows that the length of transportation lines was reduced by approx. 4%. Thus, the intensity of public transport lines use that describes spatial compactness of service delivery has gone up by approx. 2% and it means that the lines were used more frequently.

Public transport: the cost-based indicators in Saale-Orla Kreis, Germany

The supply-demand responsiveness is mainly based on policy as well as (social) trends, but partly also economic developments. If administrations and politicians decided to support public transport then this will happen, thus this is more important than the economic factor. This is linked to demographic change, in a way that demographic change leads to fewer demand for public transport in rural areas, and thus to lower supply of offers.

The supply of services is more linked to quality. This can be seen by the closure of railway lines after 1990. thus a reduction of quantity, but the raise of frequencies and mostly also of speed to offer a more attractive railway offer with higher quality. Also the gradual exchange of old buses and trains with new barrier-free low-floor buses as well as trains leads to higher quality.

Tab. XX. Cost-related variables: public transportation in Saale-Orla Kreis, Germany

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	98,592	96,607	94,501	92,093	89,825	87,799
Area (sq km)	1148,27	1148,41	1148,41	1148,41	1148,41	1148,48
Budget income per capita (EUR/person)	1155,54	1100.88	1107,86	1252,78	1765,27	1366,21
Budget debt ratio (%)	126,11%	128,78%	124,38%	103,42%	68,57%	NDA
FINANCE						
Total operators' expenditure on public transport - buses, trams (thousand national currency)	6876,36	6834,00	7044,00	6865,00	7130.00	7742,00
Total operators' revenues on public transport - buses, trams (thousand national currency)	4856,76	4711,00	4770.00	3891,00	3736,00	3916,00
Operators' revenues on core service sold - revenue on tickets in buses, trams (thousand national currency)	2792,16	2485,00	2546,00	2439,00	2311,00	2557,00
Operators' investment expenditure on public transport - buses, trams (thousand national currency)	1988,00	333,00	1339,00	1028,00	458,00	596,00
Operators' operational expenditure on public transport - buses, trams (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Operators' repair and maintenance expenditure in public transport - buses, trams (thousand national currency)	117,09	154,00	177,00	88,00	378,00	1028,00
Subsidies of LAU local government to public transport system - buses, trams (thousand national currency)	1227,00	1188,00	1371,00	2192,00	3336,00	3894,00
CUSTOMERS AND VOLUME						
Number of passengers in buses, trams per year (person)	3236429	2583829	2531323	2925639	2923121	3349092

Distance travelled by means of transportation - buses, trams (km)	3541674,00	3625711,00	3479099,00	3201794,00	3333411,00	3446727,00
Length of public transport - buses, trams - lines (km)	1250.00	1250.00	1250.00	1250.42	1250.42	1250.42
Number of buses and trams (units)	102,00	98,00	102,00	101,00	102,00	91,00
Capacity of means of public transportation - buses, trams (person)	8160.00	7840.00	8160.00	8080.00	8160.00	7280.00
Average age of means of public transportation - buses, trams (years)	13	12	13	10	8	10
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Return on public transport	-41,58%	-45,06%	-47,67%	-76,43%	-90.85%	-97,70%
Return on service sold	-146%	-175%	-177%	-181%	-209%	-203%
Cost of public transportation per km	0.001942	0.001885	0.002025	0.002144	0.002139	0.002246
Share of investment costs in total expenditure	29%	5%	19%	15%	6%	8%
Share of operational costs in total expenditure	NDA	NDA	NDA	NDA	NDA	NDA
Share of repair and maintenance costs in total expenditure	2%	2%	3%	1%	5%	13%
Share of subsidies in total revenues	NDA	NDA	NDA	NDA	NDA	NDA
Intensity of public transport lines use	2833,34	2900.57	2783,28	2560.57	2665,83	2756,46

note: this is the budget (income) of the Kreis divided by the number of inhabitants
note: this is the total debts divided by the annual budget (income) of the Kreis! it is not the debt divided by GDP

Source: based on data gathered and delivered by Thuringian Ministry for Building, Regional Development and Infrastructure

According to information provided for 2000-2010. the return on public transport shows systematic loss. In 2000. the indicator was at the level of –41,5% and in 2010 it reached –97,7%. In other words, each 1 EUR spent on public transportation by the user generated nearly 1 EUR of loss to the contracting municipality. The other related indicator – return on core service sold – is according to the data different than return on public transport. It equals -146% in 2000 and reaches -203% in 2010 with a constant increase during the 10 years period.

The number of busses has gone down during the 10 years by 11% and at the same time the same their capacity has been kept at the same level. The investments on public transportation have resulted in decrease in an average year of the fleet. The distance travelled by busses has been reduced over 10 years by 3%, nevertheless, it had been going radically down by 2006 and then started to go up. Also, in 2006, the number of passengers started to climb up after reaching a minimum in the 10 years period. To conclude, for the given period the modernisation of fleet and an increase of public transportation usage on the edge of

2004/2006 period, did neither result in increase in return on public transportation nor in return on core service sold.

Even though after 2004, the total amount of kilometres travelled by buses has gone up , the average cost per kilometre is higher. The difference is only 0.1 EUR per km and may be a result of increase in total expenditure by 13%, increase in total amount of travelled km by 7,6% as well as an increase of inflation reaching a total of 10% over the period 2004-2010.

Share of investment costs in total expenditure equals on average 14%. Nevertheless, it is a subject of changes and in 2000 it reached a highest 29% and in 2008-2010 it was at the level of 6-8%. At the same time, the fleet has been modernised. The share of maintenance and repair costs was growing steadily since 2000 (apart from 2006). It means that maintenance and repair gains higher significance in the total costs of public transportation. The reduction of 10% of fleet in 2010 has led to a sharp increase in average age of the busses in operation. Theoretically, this could lead to an increase in maintenance and repair costs as the distance travelled changed moderately (3% in 2008-2010). One may assume that the differences relates to investment costs and price changes over the time.

The share of subsidies in total revenues that describes the level of public intervention towards public transportation in Saale-Orla-Kreis could not be estimated due to missing data.

Since the length of transportation lines did not change in the given period, the intensity of public transport changes according to distance travelled.

Public transport: conclusions

For both selected cases, the return on public transportation ratios is not favourable. The costs in general are either balanced according to inflation or slightly going up. Neither in Vejprty, nor Saale-Orla-Kreis a perspective of financial returns can be expected. Anyway, this may be regarded as common in territories characterised by weak demand for the service where there is high fixed costs. In both cases, the share of subsidies goes up over the years and compensates the losses to the public service. One may expect that in general, it is hardly to find any territory with no need to subsidise the public transportation.

As in both cases the population change is believed to influence future situation of the service and its infrastructure, there is a question whether it may impact only the demand for the service or it will severely change the economy of operations. In other words, the subsidies delivered to the system are key to its functioning. As long as the subsidies are provided, there may be limited interest in adaptation either via pro-effective solutions or decreasing the scope

of the service. It is mainly linked to the common fact that every change that would strongly impact efficiency needs investments first.

Roads: the cost-based indicators in Saale-Orla Kreis, Germany

The supply-demand responsiveness is mainly based on policy as well as (social) trends, but partly also economic development. If policy-makers decide to maintain road system, this will happen, thus this is more important than the economic factor. This is linked to demographic change, in a way that demographic change leads to fewer demand for roads in rural areas, and thus to lower supply of offers. The supply of services is more linked to quantity, because still roads are not de-activated (closed) and regional road administrations try to maintain complete road network, although not always necessary.

Tab. XX. Cost-related variables: roads in Saale-Orla Kreis, Germany

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	98,592	96,607	94,501	92,093	89,825	87,799
Area (sq km)	1148,27	1148,41	1148,41	1148,41	1148,41	1148,48
Budget income per capita (EUR/person)	1155,54	1100.88	1107,86	1252,78	1765,27	1366,21
Budget debt ratio (%)	126,11%	128,78%	124,38%	103,42%	68,57%	0.00%
FINANCE						
Total expenditure on LAU-managed roads (thousand national currency)	4970.10	3859,60	2783,30	2912,90	3727,40	3615,80
Total investment expenditure on LAU-managed roads (thousand national currency)	2442,50	1600.00	571,80	545,30	1434,70	1029,30
Total maintenance expenditure on LAU-managed roads (thousand national currency)	440.80	307,50	382,80	432,30	480.50	612,50
Total expenditure on street lightning on LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total expenditure on non-LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total investment expenditure on non-LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total maintenance expenditure on non-LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total expenditure on street lightning on non-LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Income on LAU-managed roads - redistribution, subsidies, fees, tolls (thousand national currency)	1314,90	896,50	416,10	265,80	661,10	317,90
Income on non-LAU-managed roads - redistribution, subsidies, fees, tolls (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
CUSTOMERS AND VOLUME						
Length of LAU-managed road network	236,00	242,00	249,00	243,00	265,00	269,00
Length of non-LAU-managed road network	NDA	NDA	NDA	NDA	NDA	NDA
Number of cars registered in LAU (units)	67693	69785	70550	71573	62973	63398
Length of bicycle roads	NDA	NDA	NDA	NDA	NDA	NDA
Length of LAU-managed roads equipped with street	NDA	NDA	NDA	NDA	NDA	NDA

Data	2000	2002	2004	2006	2008	2010
lightning						
Length of non-LAU-managed roads equipped with street lightning	NDA	NDA	NDA	NDA	NDA	NDA
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Share of income on LAU-managed roads in total expenditure on LAU-managed roads	26,46%	23,23%	14,95%	9,12%	17,74%	8,79%
Share of income on non-LAU-managed roads in total expenditure on non-LAU-managed roads	NDA	NDA	NDA	NDA	NDA	NDA
Average cost of public roads per km	21,06	15,95	11,18	11,99	14,07	13,44
Share of repair and maintenance costs in total expenditure on LAU-managed roads	0.09	0.08	0.14	0.15	0.13	0.17
Share of repair and maintenance costs in total expenditure on roads	NDA	NDA	NDA	NDA	NDA	NDA
Average cost of street lightning per km of roads	NDA	NDA	NDA	NDA	NDA	NDA
Average maintenance cost of district roads per km	1,867	1,270	1,537	1,779	1,813	2,276

Source: based on data gathered and delivered by Thuringian Ministry for Building, Regional Development and Infrastructure

According to information provided for 2000 - 2010. the share of income on LAU-managed roads (district roads) in total expenditure on LAU-managed roads (district roads) describes the intensity of external financing of the district network. The trend here is evidently a decrease. It has gone down from 26,4% in 2000 to 8,8% in 2010. The change is more a result of reduced external financing to LAU (decrease of 76% in 2010 compared to 2000) than a reduction of total expenditure (decrease of 27% in 2010 compared to 2000). Even though the costs were reduced, the length of district roads has increased in 2010 by 14% as compared to 2000.

The average cost of district roads per km is decreasing. However, it is hard say whether it is a symptom of economic efficiency or more a result savings in maintenance costs. The changes in road length do not play significant role in the average total cost of roads. However, since 2004 the cost of maintenance of district roads increased bi-annually. The inflation ratio over the 10-year period reached a 17,5%. The share of repair and maintenance costs in total expenditure on district roads describes the level of technical usage of LAU managed district road network. It shows a rather constant increase over the 10 years and compared to total expenditure, that is on a down-curve, could be understood as a need for more and more repair works. As the length of roads has been increasing, it may also be a factor of extended financing for the roads maintenance.

Additionally, we can observe a rather constant spending on road investment.

Roads: the cost-based indicators in Ljubljana, Slovenia

Road network expansion and maintenance is proceeded in accordance with transport plans and urban development process. Important factors for implementing new or upgrading old roads are investments in urban development. Demographic changes in the field of roads are not yet an issue in Municipality of Ljubljana. Ljubljana still faces in-migrations. Out-migrations from suburbs are not recorded.

Road network supply is driven by municipal transport plan and investments/developments. Some new roads finished in recent years substantially raised the service quality and accessibility ("*Barjanka*", "*Cukrarna*"). Pedestrian zone in the Ljubljana centre also might be recognized as a qualitative contribution.

Tab. XX. Cost-related variables: roads in Ljubljana, Slovenia

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	270.986	265,881	267,440	267,369	272,770	280.100
Area (sq km)	275	275	275	275	275	275
Budget income per capita (EUR/person)	987,27	1210.85	1326,15	1448,57	1663,43	1766,09
Budget debt ratio (%)	NDA	NDA	NDA	NDA	NDA	NDA
FINANCE						
Total expenditure on LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total investment expenditure on LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total maintenance expenditure on LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total expenditure on street lightning on LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total expenditure on non-LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total investment expenditure on non-LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total maintenance expenditure on non-LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total expenditure on street lightning on non-LAU-managed roads (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Income on LAU-managed roads - redistribution, subsidies, fees, tolls (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Income on non-LAU-managed roads - redistribution, subsidies, fees, tolls (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
CUSTOMERS AND VOLUME						

Data	2000	2002	2004	2006	2008	2010
Length of LAU-managed road network	1029,80	1059,20	1059,30	1029,50	1030.20	1030.20
Length of non-LAU-managed road network	116,20	119,60	116,30	116,20	122,00	122,80
Number of cars registered in LAU (units)	131668	133854	140422	163546	163546	141758
Length of bicycle roads	1,60	3,20	4,30	4,80	4,80	4,80
Length of LAU-managed roads equipped with street lightning	NDA	NDA	NDA	NDA	NDA	NDA
Length of non-LAU-managed roads equipped with street lightning	NDA	NDA	NDA	NDA	NDA	NDA
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Share of income on LAU-managed roads in total expenditure on LAU-managed roads	NDA	NDA	NDA	NDA	NDA	NDA
Share of income on non-LAU-managed roads in total expenditure on non-LAU-managed roads	NDA	NDA	NDA	NDA	NDA	NDA
Average cost of public roads per km	NDA	NDA	NDA	NDA	NDA	NDA
Average cost of public roads per car	NDA	NDA	NDA	NDA	NDA	NDA
Share of repair and maintenance costs in total expenditure on LAU-managed roads	NDA	NDA	NDA	NDA	NDA	NDA
Share of repair and maintenance costs in total expenditure on roads	NDA	NDA	NDA	NDA	NDA	NDA
Average cost of street lightning per km of roads	NDA	NDA	NDA	NDA	NDA	NDA

Source: based on data gathered and delivered by Urban Planning Institute of the Republic of Slovenia

As there has been no economic data on roads in Ljubljana delivered, the economic situation cannot be a subject of analysis. The length of roads increased in the period by 2004 and started to decrease afterwards. At the same time, there is a constant growth in number of cars registered in Ljubljana, except for 2010 where a significant decrease can be observed (a loss of 22 thousand cars; i.e. - 13% as compared to 2008).

By the year 2006, a 300% increase in the length of bicycle roads can be observed. However this is still less than 5km in Ljubljana.

Roads: conclusions

There is a natural disproportion of demand and supply in road infrastructure due to the fact that historically established roads can hardly be deactivated. Moreover, any settlement needs road infrastructure regardless depopulation and growth dynamics. While any significant increase in population may impact new road investments, the depopulation trend will rather

not lead to road abandonment. For this reason, the main concern of any authority will be turned to costs of maintenance. Investments and spending on new infrastructure will be only linked to development processes focused on boosting territorial attractiveness of precisely defined areas. For example it may include industrial zones or places challenged with potential depopulation.

Water and sewage: the cost-based indicators in municipalities of Ostana, Crissolo, Oncino, Paesana, Sanfront, Revello, Martiniana Po, Gambasca, Rifreddo (Po Valley area), Italy

Even if the priority about the decisions is economic, the choices made in the past few years have been influenced by political factors, that negatively influenced the administration at economic level. The extreme fluidity about the laws does not allow to do an accurate interpretation on what will be the forthcoming developments.

The main critique concerns the deep laws incertitude, which has marked the last decade and will keep on characterizing the sector in the coming years. The composition of the ATO governance, in reorganization today, involves the coexistence of political local factors and economic factors.

Particularly the development of the most isolated areas, still not reached by water and sewerage system, involves high investments for the extension of the networks (in order to guarantee the same services to the whole population): the absence of those investments could adversely affect the demographic change, especially in a framework of general lack of the primary services for the population of the mountain marginal areas (transports, schools, means of communication, etc.).

Where existing, the infrastructures of the integrated water system of the case study region guarantee a moderate quality standard (in particular, they show serious problems in terms of dispersion of water resources), so today more attention shall be dedicated to the service accessibility, fundamental to contribute to the demographic maintenance and increase on the territory.

Even if there are many difficulties in terms of investments, involved authorities are trying to increase the accessibility to the integrated water network to every single area that is part of the municipality's territory, with particular attention to the areas that are having a positive demographic evolution for several reason.

Tab. XX. Cost-related variables: water and sewage in municipalities of Po Valley, Italy

Data	2000	2002	2004	2006	2008	2010

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	12,31	12,31	12,40	12,42	12,44	12,34
Area (sq km)	290.37	290.37	290.37	290.37	290.37	290.37
Budget income per capita (EUR/person)	7763,00	8220.00	8616,00	9295,00	10128,00	10429,00
Budget debt ratio (%)	NDA	NDA	NDA	NDA	NDA	NDA
FINANCE						
Total operators' expenditure on water provision (thousand national currency)	599,786	471,259	480.968	469,531	501,745	474,361
Total operators' revenues on water provision (thousand national currency)	419,836	428,384	441,818	430.051	465,248	486,042
Operators' revenues on water from households (core service sold - revenue on invoices) (thousand national currency)	390.202	396,326	408,369	394,978	414,883	430.012
Operators' revenues on water from companies (core service sold - revenue on invoices) (thousand national currency)	29,637	32,061	33,452	35,621	50.373	56,037
Operators' investments expenditure on water provision (thousand national currency)	261,071	97,880	100.830	90.330	164,847	82,170
Operators' operational costs on water provision (thousand national currency)	145,256	146,561	151,972	151,034	163,501	176,592
Operators' repair and maintenance costs on water provision (thousand national currency)	193,459	226,818	228,166	228,167	173,396	215,599
Subsidies of LAU local government to households water provision (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total operators' expenditure on sewerage (thousand national currency)	134,840	215,296	291,016	249,454	252,839	229,865
Total operators' revenues on sewerage (thousand national currency)	135,634	133,649	137,125	140.395	112,683	110.208
Operators' revenues on sewerage from households (core service sold - revenue on invoices) (thousand national currency)	123,294	117,404	120.655	122,799	97,286	91,385
Operators' revenues on sewerage from companies (core service sold - revenue on invoices) (thousand national currency)	15,480	16,250	16,424	17,600	15,404	18,830
Operators' investment expenditure on sewerage (thousand national currency)	16,674	17,884	69,054	15,054	24,457	17,183
Operators' operational costs on sewerage (thousand national currency)	50.534	90.534	114,764	116,019	129,863	102,577
Operators' repair and maintenance costs on sewerage (thousand national currency)	67,632	106,878	107,198	118,381	98,520	110.105
Subsidies of LAU local government to households sewerage (thousand national currency)	0.000	0.000	0.000	0.000	0.000	0.000
CUSTOMERS AND VOLUME						
Number of households in water network (thousand)	7,714	7,780	7,818	7,928	8,044	8,064
Number of households in sewerage network (thousand)	4,087	4,157	4,216	4,330	4,434	4,444
Length of water network (km)	346,825	346,825	346,825	346,825	382,225	382,225
Length of sewerage network (km)	95,260	95,260	97,260	97,260	99,370	99,370
Total amount of distributed water to households (thousands m3)	1158,022	1164,479	1190.842	1108,907	1049,702	1012,770
Total amount of treated sewerage from households (thousands m3)	620.240	627,585	633,884	653,186	618,741	601,409
Total amount of distributed water to companies	190.936	198,145	199,836	202,349	210.196	215,526

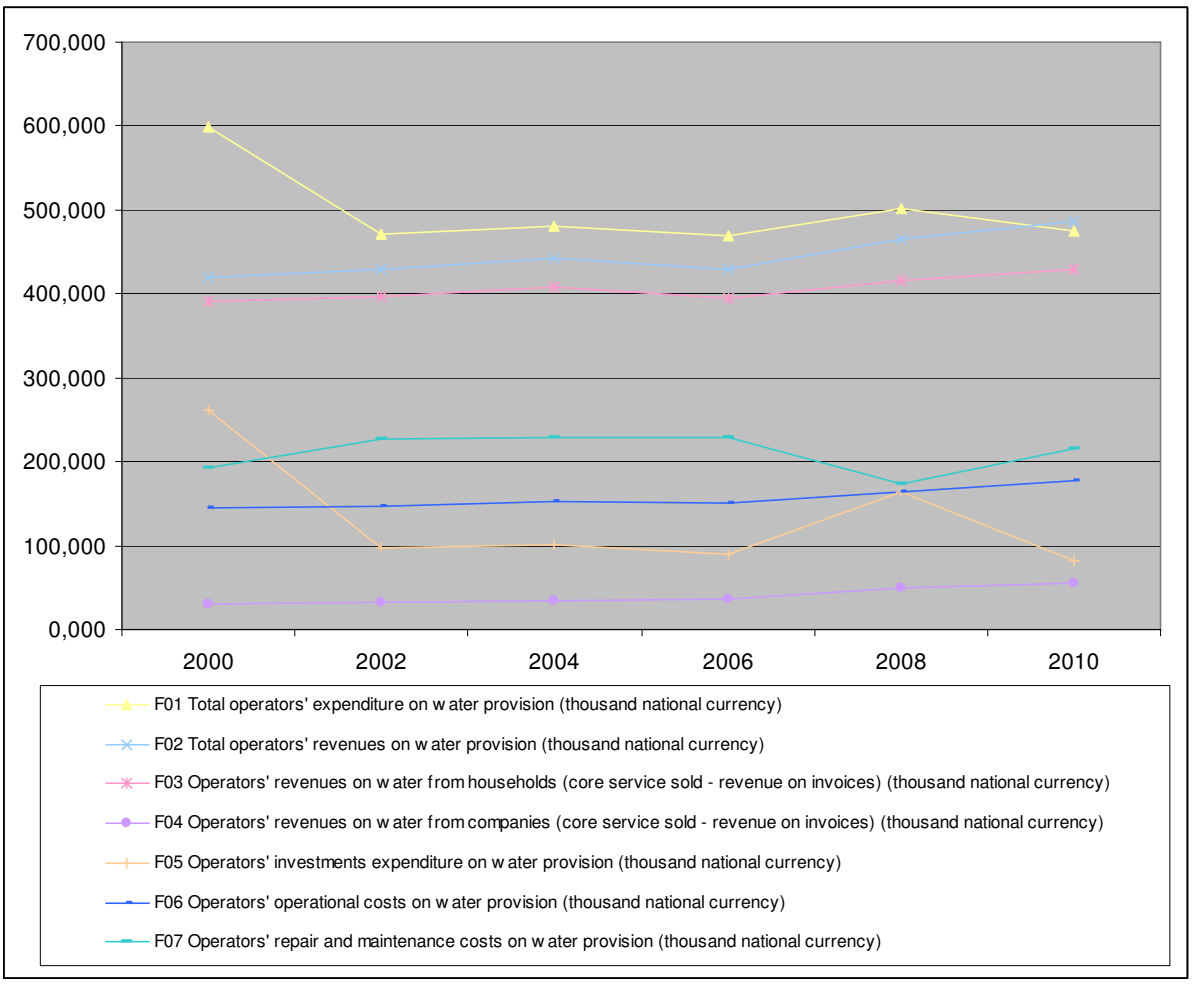
Data	2000	2002	2004	2006	2008	2010
(thousands m3)						
Total amount of treated sewerage from companies (thousands m3)	53,735	57,672	58,813	66,530	61,778	67,108
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Return on water	-30.00%	-9,10%	-8,14%	-8,41%	-7,27%	2,46%
Return on sewerage	0.59%	-37,92%	-52,88%	-43,72%	-55,43%	-52,06%
Cost of water provision per km	1,73	1,36	1,39	1,35	1,31	1,24
Cost of water provision per thousand m3	0.44	0.35	0.35	0.36	0.40	0.39
Cost of sewerage treatment per km	1,42	2,26	2,99	2,56	2,54	2,31
Cost of sewerage treatment per thousand m3	0.20	0.31	0.42	0.35	0.37	0.34
Share of operational costs on water in total expenditure on water	24,22%	31,10%	31,60%	32,17%	32,59%	37,23%
Share of operational costs on sewerage in total expenditure on sewerage	37,48%	42,05%	39,44%	46,51%	51,36%	44,62%
Share of repair and maintenance costs on water in total expenditure on water	32,25%	48,13%	47,44%	48,59%	34,56%	45,45%
Share of repair and maintenance costs on sewerage in total expenditure on sewerage	50.16%	49,64%	36,84%	47,46%	38,97%	47,90%
Share of subsidies to households on water in sales of water	NDA	NDA	NDA	NDA	NDA	NDA
Share of subsidies to households on sewerage in sales of sewerage services	NDA	NDA	NDA	NDA	NDA	NDA
Intensity of water network	0.02	0.02	0.02	0.02	0.02	0.02
Intensity of sewerage network	0.04	0.04	0.04	0.04	0.04	0.04

Source: based on data gathered and delivered by National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation

According to information provided for 2000 - 2010. the return on water, that describes the level of profitability or deficit in financing of water supply shows systematic growth. In 2000. the indicator was at the level of –30% and in 2010 it reached 2,5%. In other words, each 1 EUR spent on water generated nearly 0.3 EUR of loss in 2000 and now it brings a 0.02 EUR surplus. The growth of demand for water supply was not observed (a total change of -12,5% in 2000 vs. 2010 and highest decrease starting after 2006). However, there is a constant increase in water supplied to companies (a total growth of 13% with a highest year-to-year growth starting after 2006).

Both household and company-based revenues on water provision have gone up in the given period. As shown on figure XX, the 2006 brings an up-going tendency with revenues collected from both households and companies. At the same time the expenditure on water provision has decreased both in terms of total and repair and maintenance. The inflation in Italy ranged at 24,6% cumulating the values for years 2000-2010.

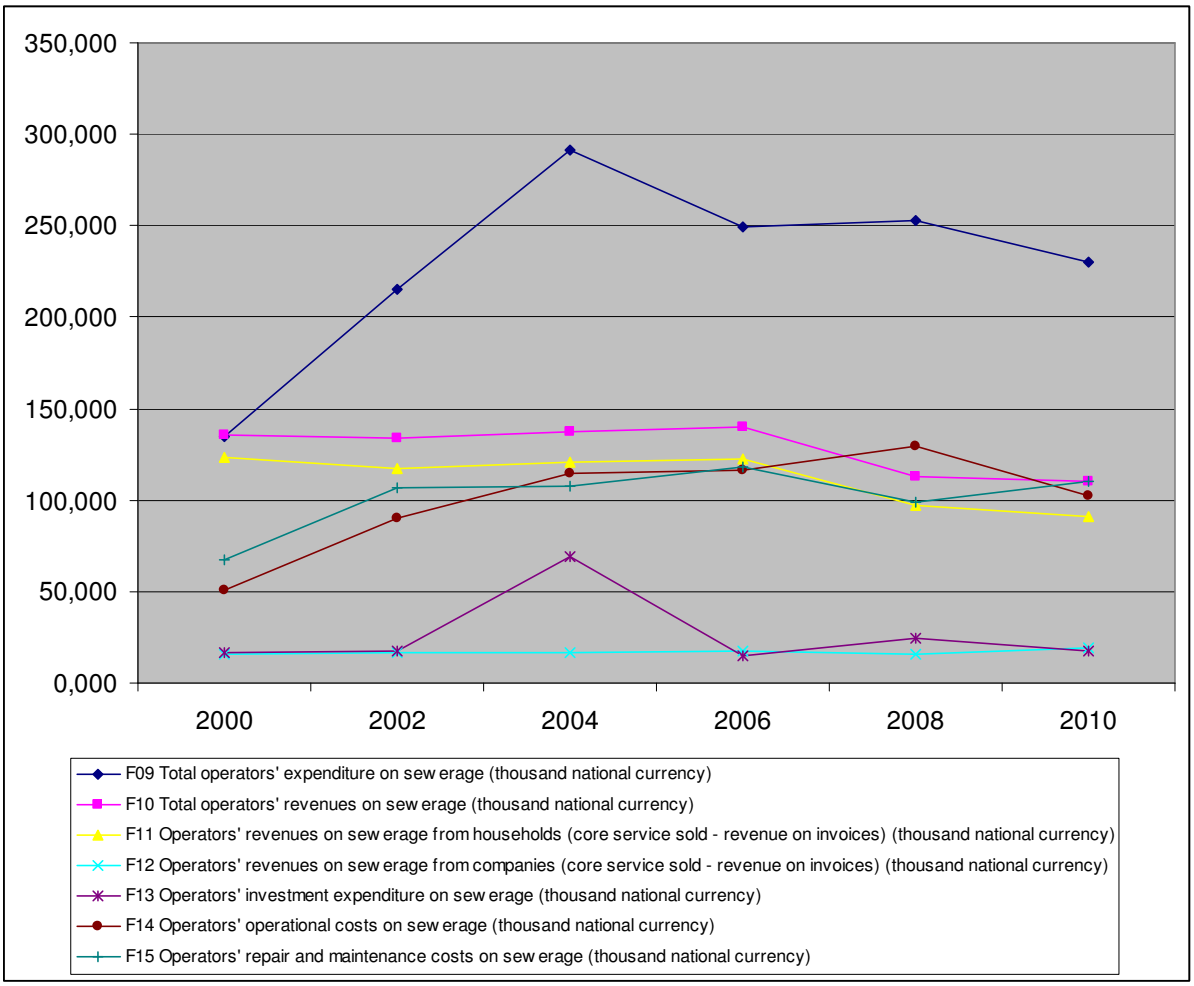
Fig. XX Operator's costs and revenues on water provision in municipalities of Po Valley, Italy



Source: based on data gathered and delivered by National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation

The return on sewerage describes the level of profitability or deficit in financing of sewerage treatment. In a given period, the situation is quite opposite to the situation of return on water. The profitability of sewage treatment show in 2000 a +0.6%, whereas it reached a -52%. The highest loss concerns 2008 when every 1 EUR spent on sewage treatment generated a 0.52 EUR loss. In nominal values, the biggest spending on expenditure was reported in 2006 (fig. XX) but it was interlinked with a high amount of investment spending. One of the reasons for such a situation can be seen in the constant growth of operational costs that climbed up till 2008. The amount of household sewage treated in Po Valley has been increasing till 2006 and went significantly down after then (a 5% and 4 % decrease of treated household sewage respectively in 2008-2006 and 2010-2008 periods). There has been a change in the length of sewage network but it was a 5% increase over the 10 years.

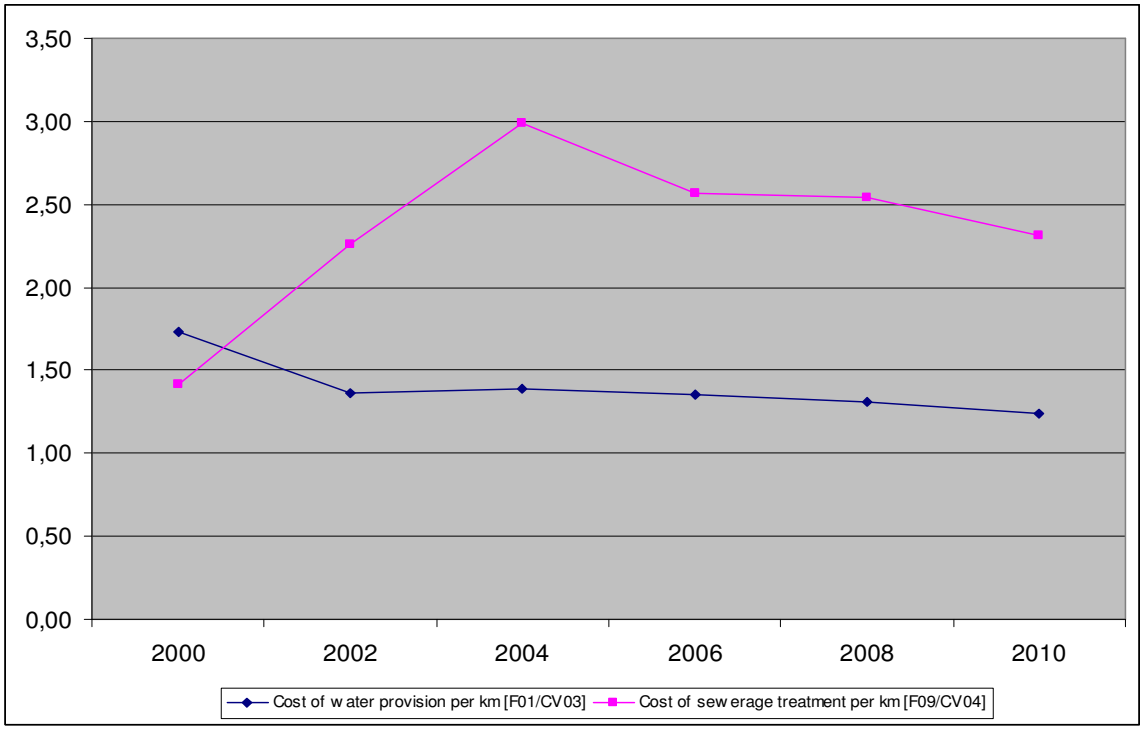
Fig. XX Operator's costs and revenues on sewage treatment in municipalities of Po Valley, Italy



Source: based on data gathered and delivered by National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation

When it comes to operators' average cost of water per km of water network as well as operators' average cost of sewage per km of sewage network (fig. XX), there is a tendency of growth for sewage and decrease for water as calculated in nominal values (inflation not calculated). The share of repair and maintenance costs on sewage in total expenditure on sewage equals nearly 50% during the 2000-2010 period, except for 2004 and 2008 when it was calculated at the level of approx. 37%. Also, the share of operational cost on sewage in total expenditure on sewage varies in years and it counts for in between 37 and 51%.

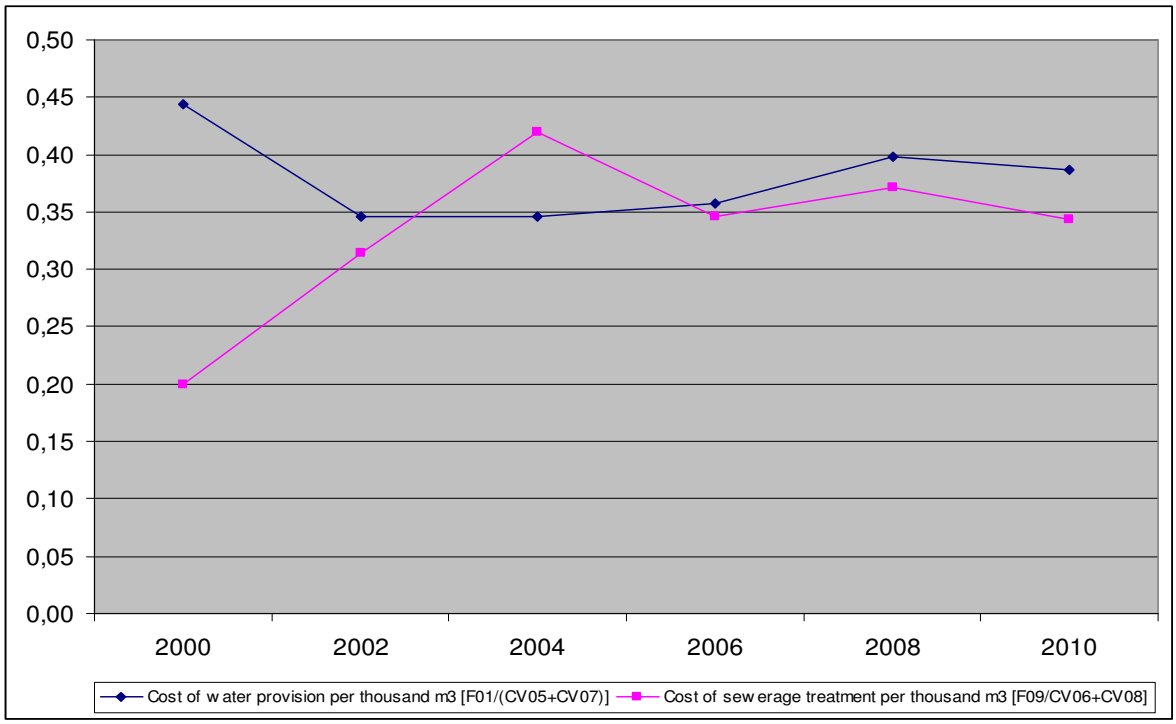
Fig. XX. Water and sewage average cost of infrastructure per km in municipalities of Po Valley, Italy



Source: based on data gathered and delivered by National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation

The year 2006 was a „milestone" in cost of sewage per km of network as the cost per 1 dm3 also started to go down. The average cost of water per 1 dm3 has not been radically changed (fig. XX). There has been an increase during 2006-2008.

Fig. XX. Water and sewage average cost of infrastructure per dm3 in manipulates of Po Valley, Italy



Source: based on data gathered and delivered by National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation

The intensity of water network and sewage network that describe spatial compactness of service delivery is not changing over the 10 year period, which means that the increase of households or other users pluged-in is ballanced with new infrastructure.

Water and sewage: the cost-based indicators in Katowice, Poland

Municipalities are by law responsible for the service of water supply and sewage treatment. In practice, it is the service offered by the operator(s) whose technical and economic potential allows the service provision. The role of the policy-makers should be seen as a guard of general standards and economics of the service. Nevertheless, it is mainly the tariffs and standards that are a community responsibility. Municipalities take care of control over the economic policy of the operator by means of legal agreements over the tariffs and therefore react based upon the costs-criteria. It may be either socially acceptable cost or/or economically justified municipal spending. Moreover, as a rule, water supply and sewage treatment should not by limited by municipality in terms of economic targets. It is the long-

term development plan that should offer a possibility to react to any economic instability or development tendencies.

Tab. XX. Cost-related variables: water and sewage in Katowice, Poland

Data	2000	2002	2004	2006	2008	2010
BASIC DATA						
Population (thousands)	330.625	325,045	319,904	314,500	309,621	311,421
Area (sq km)	164	164	164	165	165	165
Budget income per capita (EUR/person)	NDA	NDA	NDA	NDA	NDA	NDA
Budget debt ratio (%)	NDA	NDA	NDA	NDA	NDA	NDA
FINANCE						
Total operators' expenditure on water provision (thousand national currency)	NDA	NDA	NDA	NDA	NDA	71383,90
Total operators' revenues on water provision (thousand national currency)	NDA	NDA	NDA	NDA	NDA	73581,40
Operators' revenues on water from households (core service sold - revenue on invoices) (thousand national currency)	39898,90	43477,40	43767,80	49039,80	49213,20	52541,10
Operators' revenues on water from companies (core service sold - revenue on invoices) (thousand national currency)	17973,60	17430.10	17266,20	18609,70	18550.50	19639,20
Operators' investments expenditure on water provision (thousand national currency)	10167,00	960.00	5615,00	3889,00	6666,00	10038,00
Operators' operational costs on water provision (thousand national currency)	63587,90	62700.90	62672,80	68422,40	69484,40	70582,80
Operators' repair and maintenance costs on water provision (thousand national currency)	7235,00	5180.00	4705,00	8866,00	8300.00	2945,00
Subsidies of LAU local government to households water provision (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
Total operators' expenditure on sewerage (thousand national currency)	NDA	NDA	NDA	NDA	NDA	83319,40
Total operators' revenues on sewerage (thousand national currency)	NDA	NDA	NDA	NDA	NDA	85569,60
Operators' revenues on sewerage from households (core service sold - revenue on invoices) (thousand national currency)	21907,50	25707,30	24409,90	28307,50	34707,10	52870.90
Operators' revenues on sewerage from companies (core service sold - revenue on invoices) (thousand national currency)	15560.20	16768,50	12831,20	14630.90	18739,90	36046,70
Operators' investment expenditure on sewerage (thousand national currency)	7001,00	941,00	3628,00	3561,00	3010.00	8205,00
Operators' operational costs on sewerage (thousand national currency)	27799,50	33535,00	29027,30	45751,60	51990.40	87759,40
Operators' repair and maintenance costs on sewerage (thousand national currency)	2315,00	423,00	2961,00	10213,00	1677,00	2209,00
Subsidies of LAU local government to households sewerage (thousand national currency)	NDA	NDA	NDA	NDA	NDA	NDA
CUSTOMERS AND VOLUME						
Number of contracts in water network (thousand)	15874	16931	18025	18901	20024	24353
Number of contracts in sewerage network (thousand)	14312	15067	15979	16719	17573	18362
Length of water network (km)	719,40	726,90	738,50	741,10	736,32	965,27
Length of sewerage network (km)	397,30	401,60	402,20	402,80	323,70	552,54

Total amount of distributed water to households (thousands m3)	15519,40	14038,10	12764,20	11881,40	11424,60	10979,20
Total amount of treated sewerage from households (thousands m3)	14080.80	13479,80	11990.90	11212,10	10816,40	10444,40
Total amount of distributed water to companies and public bodies (thousands m3)	6992,10	5632,60	5061,60	4738,20	4419,80	4237,50
Total amount of treated sewerage from companies and public bodies (thousands m3)	8166,20	6863,80	6293,80	5784,70	5864,90	8885,60
Total amount of distributed water to other users – public bodies (thousands m3)	NDA	NDA	NDA	NDA	3405,20	3154,90
Total amount of treated sewerage from other users – public bodies (thousands m3)	NDA	NDA	NDA	NDA	3196,00	6479,00
COST INDICATORS OF SERVICES AND INFRASTRUCTURE - SEE GLOSSARY OF INDICATORS (ANNEXED)						
Return on water	NDA	NDA	NDA	NDA	NDA	3,08%
Return on sewerage	NDA	NDA	NDA	NDA	NDA	2,70%
Cost of water provision per km	NDA	NDA	NDA	NDA	NDA	73,95
Cost of water provision per thousand m3	NDA	NDA	NDA	NDA	NDA	4,69
Cost of sewerage treatment per km	NDA	NDA	NDA	NDA	NDA	150.79
Cost of sewerage treatment per thousand m3	NDA	NDA	NDA	NDA	NDA	4,31
Share of operational costs on water in total expenditure on water	NDA	NDA	NDA	NDA	NDA	0.99
Share of operational costs on sewerage in total expenditure on sewerage	NDA	NDA	NDA	NDA	NDA	1,05
Share of repair and maintenance costs on water in total expenditure on water	NDA	NDA	NDA	NDA	NDA	0.04
Share of repair and maintenance costs on sewerage in total expenditure on sewerage	NDA	NDA	NDA	NDA	NDA	0.03
Share of subsidies to households on water in sales of water	NDA	NDA	NDA	NDA	NDA	NDA
Share of subsidies to households on sewerage in sales of sewerage services	NDA	NDA	NDA	NDA	NDA	NDA
Intensity of water network	22,07	23,29	24,41	25,50	27,19	25,23
Intensity of sewerage network	36,02	37,52	39,73	41,51	54,29	33,23

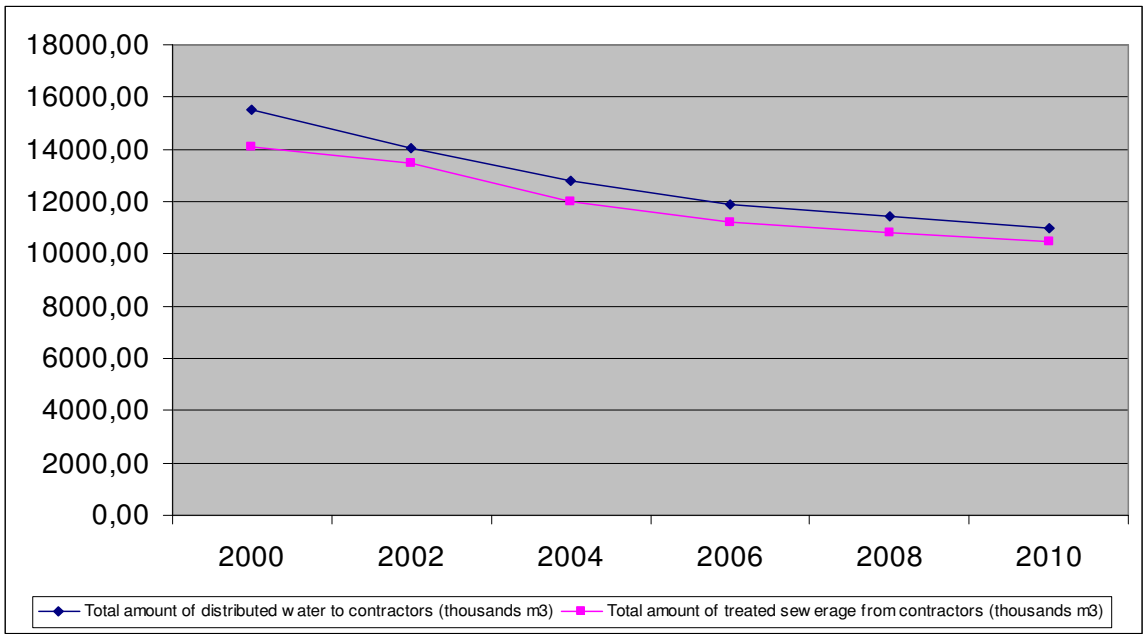
Source: based on data gathered and delivered by University of Economics in Katowice

According to the operator, there is only data for one year (2010) that can be offered as a reliable set of values towards expenditure on water. The reason is a change in the territorial range of operation that makes the economic rations in the past years incomparable. The other data – apart from the total expenditure and revenues is unified for the Katowice itself. Simply speaking, there are parts of the costs and revenues that come from the other territorial units, formerly in the area of operator's activities, that could not be extracted and therefore it is impossible to show a reliable total value set.

Anyway, the return on water for 2010 shows a 3% surplus which means that every 1 PLN gives a 0.03 PLN profit on water supply. When it comes to sewage and the return on this service, it is quite a similar characteristic with a nearly 3% profit. Even though, nothing can be said regarding the relation of ROE on water/sewage to the trends in volume and customers,

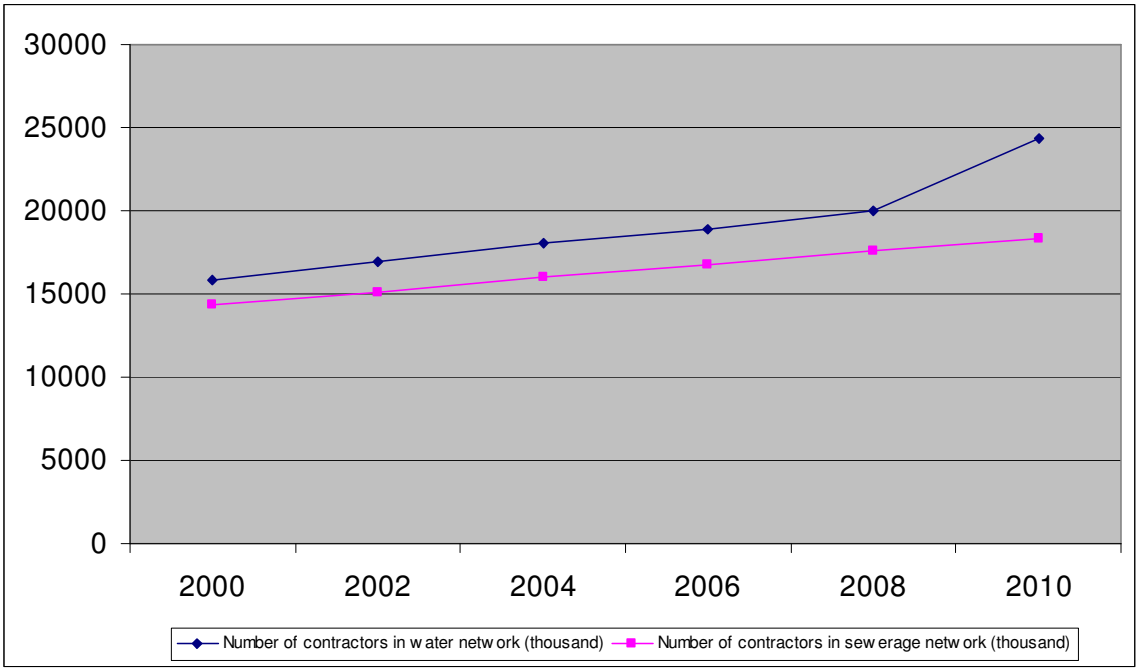
the changes in demand and supply are interesting. The number of contracts for water supply and sewage treatment in Katowice is constantly growing. Even if numbers cannot be compared, (contracting can be either a single household or a housing cooperative with 100 households), the housing market in Katowice is a balanced area with single houses and multi-household estates built in recent years. At the same time the amount of water supplied and sewage treated goes down. The reason, explained in relevant studies on water infrastructure economics, is twofold and basically reflects the demand side. Namely, it is the technology used in facilities in bath and kitchen that makes the consumption of water reduced on a daily basis and creates new and eco-friendly patterns of consumption. Secondly, and probably even more importunately, it is the economics of households' budgets. People are more aware on how much is spent on the service and do economise their expenditure.

Fig. XX. Water distribution and sewage treatment in dm3 in Katowice



Source: based on data gathered and delivered by University of Economics in Katowice

Fig. XX. Water and sewage service contractors in Katowice



Source: based on data gathered and delivered by University of Economics in Katowice

As mentioned, not much can be analysed in terms of share of particular costs in expenditure on water/sewage. The amount of money spent on maintenance and operation costs of water did not change much over the analysed period. When it comes to sewage treatment, there is a significant change in 2002, 2006, 2010. In general, the sewage costs of operator are related to spending on sewage treatment and taxes that is externally decided. Thus,, the operational costs have risen by at least 20% these years as compared to a preceding year in the table (2002/2000. 2006/2004, 2010/2008). In 2010 the difference in operational costs as compared to 2008 was at a highest level of + 70%. The inflation in Poland over 10 years amounted a 32% (in cumulative value).

As the revenues are calculated based on the tariffs system and thus are planned in advance (i.e. based on the volume sold / demand in the proceeding year), there is no surprise the revenues are going up nearly every year. Theoretically, the loss cannot happen as costs do not count in the perspective of depopulation trends/demand decrease. The financing of the services should be balanced and it is set up so as not to generate a loss. We may assume, that it is only a technical or other place-based specific problem (i.e. coal mine damage) that could lead to a financial loss in a given year. The citizen is to pay the amount calculated based on a share in total service sold by the operator .

Finally, the intensity of water network that describes a spatial compactness of service delivery is a subject of changes over time. The indicator shows an increase up till 2008 and goes down in 2010. A new infrastructure that is reported for 2010 sets the indicator in the time of 2006 reaching approx. 25 “contracted services” per km of the network. In the suburbs the contracts would be more a single household delivery whereas areas closer to the centre could be regarded as more multi-household contracting.

Water and sewage: conclusions

There is limited possibility to analyse both cases as they offer different data sets. The observations regarding a single year and changes in numbers allow only to forward a hypothesis on a less balanced cost structure in Italian case. The loss on sewage and a small profit on water supply may be a result of technical and terrain aspects of the mountainous specifics of Po Valley area. The Katowice case study shows only that a system with tariffs set up (based) on the volume of previous years, even if unfair to some users, compensates the losses resulting from any bottlenecks of technical (space-based and infrastructural) and demographic nature.

In general, as water provision is the basic public good, its demographic elasticity of supply is rather small. In other words, the demand must be fulfilled anyway, the only issue is whether the final beneficiary is able to cover the costs. So, the issue is whether the (usually) increasing costs of water delivery/sewage treatment are transferred onto the final user (citizen, company) or the are subsidised by public authority of any level. The fixed costs of the system mainly determine the economics of water provision/sewage treatment services and infrastructure.

Maintenance costs and investments cannot be stopped over the depopulation processes as technical operation of the system needs to be kept. It is hardly possible that a complete district/significant part of the city is closed down.

3.4. The influences over future situation in social and network services (and their infrastructures)

Not just the economy serves as the driving force behind adaptation in service delivery. There are more factors that influence operations and decision making. Some of them are locally-based, mainly dependant on local institutions activities and changes of citizens preferences, the other are external mainly dependant on national legislations. The issues worth particular attention are e.g.: frequent political changes or strategic plan implementations; citizen pressures, bottom-up initiatives; technological standards upgrades/downgrades of infrastructure; urban land use changes or other spatial processes. Local experts within the ADAPT2DC project identified key factors relevant to thematic fields and territories. Afterwards these findings, in a perspective of previous parts, have been aggregated in order to deliver questions and hypothesis on futures of social and network services and their infrastructures.

3.4.1. Social services and their infrastructure: trends and tendencies

The identified locally-based and external factors influencing futures of social services are presented in tab. XX.

Tab. XX. Factors influencing futures of social services and their infrastructure

FIELD	LOCATION	LOCALLY-BASED FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE	EXTERNAL FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE
Social care	Jászárokszállás, Hungary	- Employment possibilities are increasing in the examined LAU due to the active functioning of the industrial park of the settlement. Due to these changes probably more children will attend the local nursery. To launch new forms of children care services (e.g. children daycare nurseries) might be required by parents working in shifts for the companies operating in the industrial park. - The number of disadvantaged and severely disadvantaged children is	- Presently the Hungarian public administration is facing changes due to an overall reform. These changes in the public administration might cause challenges for local social policy. - The new act on national public education that will come into force on 1 September 2013 declares that from 1 September 2014 attendance in kindergarten will be compulsory from the age of 3 years. - Maximizing numbers of children in a nursery/kindergarten group

FIELD	LOCATION	LOCALLY-BASED FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE	EXTERNAL FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE
		kindergarten teachers will face special challenges in the field of developing children of special needs. - Positive population changes in the examined LAU might have an effect on the local social care service and infrastructure in the next few years. The newcomer population who move to the settlement due to the employment possibilities will likely to affect the increase of nursery and kindergarten places. - Considering aging population negative demographic changes can also occur, therefore the services provided	governesses and kindergarten teachers will be needed to be employed. - The worsening eating habits of children is likely to influence the range of medical care services integrated to social services provided for children. - The Hungarian National Development Concept for the period of 2014-2020 regarding positive demographic changes as a priority according to which the number of children is likely to increase in Hungary.
	Valley Po, Italy	- The reorganization of social care - The commitment of local administrators (majors, etc.) - The breaking up of Mountain Community - Budget plan restrictions also for small municipalities - Bureaucracy	- Less financial means due to the economic crisis of the country - Inefficiency of public machine - The likely new taxes - Globally, the aging population will increase the demand for services - The Regional reform laws on social care are not adapted to the needs
	Kozłów, Poland	- Lack of employers who could offer job possibilities to the local unemployed - Insufficient bus connection resulting in limited possibilities of commuting to bigger towns e.g. Krakow as well as high travelling costs - Local social welfare centre is a small one. The staff includes the manager, two social workers, and two carers. Additionally, some of the tasks are contracted: family assistant, accountant, other administration staff. Consequently, there is little potential of expanding activity -	- Insufficient external funds preventing hiring specialists (psychologist, lawyer, employment counsellor), launching addiction treatment or intervention helpdesk
Health care	Jászárokszállás, Hungary	- Further development of local infrastructure (including buildings, roads, etc.) - The improvement of doctor-patient proportion (more doctor for less patient would be advantageous) - Programmes targeting the enhancement of health-	- Introduction and further development of central screening programmes - Increase the standards of health care in the neighbour towns' hospitals - Human resource crisis emerging due to the ageing of health care professionals, staff shortages and

FIELD	LOCATION	LOCALLY-BASED FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE	EXTERNAL FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE
		consciousness of local people (regular screening programmes, prevention programmes) - Continuously increasing number of patients (ageing population as well as the younger newcomers) require a more diversifying health care services which includes local in-patient care as well	increasing migration, especially among physicians - The elections for mayors and municipalities which will be held next year (2014) could cause considerable changes in the local council as well as changing of the mayor might happen that can influence local attitude towards health services. - Health industry becomes a strong strategic area for economic development and growth for the Hungarian government which has consequences in the LAU as well
	Kozłów, Poland	- Lack of additional financing sources (e.g. from local authorities) - No price increase with regard to medical services - Scarce natural growth in the community - Ageing population in the community - Insufficient funds from the local authorities for modernization and renovation of small healthcare units - Cost-cutting policy	- Lack of additional financing sources - No increase in official National Health Fund's rates for treatment - Insufficient funding from the National Health Fund for the unit's development - Ageing society increasing the costs of medical services - Insufficient state funds for modernization and renovation of small healthcare units - The general policy of cutting costs
Public housing	Katowice, Poland	- Increase in attractiveness of central places in Katowice - Spatial reorganisation of housing units - The change of social exclusion level - Privatisation of public housing - Flexibility of housing policy measures	- National legislation on social and public housing - Increase in income disparities - Increased funding options towards infrastructure revitalisation based on 2014+ EU financial perspective
	Ljubljana, Slovenia	- Possibility of Public Housing Fund of the Municipality of Ljubljana to receive a loan for housing investments up to 50% (previously 10%) - Energy saving subventions from Slovenian Environmental Public Fund - Spatial strategy and spatial plan of the Municipality of Ljubljana (2010)	- Regional development plan for Ljubljana region 2014-2020 - Implementation of the new real estate tax system - Implementing alternative housing for old people according to Slovenian ageing strategies
	Vejprty, the Czech Republic	- Jobs - Accessibility of services and public facilities. - Population structure - Debt policy - Municipality politics according to	- Legislation - Financial means – possibilities of them, privilege loans, subsidies … - Social politics of the state

FIELD	LOCATION	LOCALLY-BASED FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE	EXTERNAL FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE
		prices	

Source: based on data gathered and delivered by:

- Észak-alföld Regional Development Agency Non-profit Ltd
- Institute of Sociology of the Academy of Sciences of the Czech Republic
- The Małopolska Region
- National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation
- University of Economics in Katowice
- Urban Planning Institute of the Republic of Slovenia

Locally-based factors determining the development of social care primarily relate to future changes in the labour markets. More flexible form of employment and greater mobility of workers will force the adjustment of social service both for children (nurseries and kindergartens) and elderly people (senior housings). Because of more and more complexity of living conditions, social care will cover more fields not only related to traditional social care, but also includes legal consulting, psychological support etc. External factors influencing the development of social care mainly concern the possible legislative changes. The most important are reforms of education and pension systems. Among the external factors are also the general cultural and social trends leading to lifestyle changes, including dietary habits or physical activities.

Among locally-based factors influencing health care sector are mainly demographic changes such as aging and increasing number of patients as its result. Demographic changes can cause a changes in the set of diseases, that are specific to the area. The other sets of factors relate to the technical state of buildings and medical equipment. External factors of the health care system development concentrate on future decisions on national level. It may concern the reform of funding system and introducing new screening programs. The health care sector may be also affected by medical staff migration, that caused shortage of specialists in the particular areas.

Internal factors influencing future situation of public housing focus on two main categories. The first one relates to changes in the local housing markets, the second one is directly linked to the state of local public housing resources. In case of local housing markets, most important factors relate to differences of spatial attractiveness of residential areas, changes of tenure choice, and growth of the housing primary market. In case of local public

housing conditions most important factors are level of technical wear, vacancy rate, and the level of arrears with the rent. The key challenge is matching the public housing offer to needs and means of different groups of households. External conditions of local public housing development seem to be strongly determined by chance of financing housing regeneration from EU funds. The next important factor are legislative changes dividing responsibilities of providing housing between state and local government.

3.4.2. Network services and their infrastructure: trends and tendencies

The identified locally-based and external factors influencing futures of network services are presented in tab. XX.

Tab. XX. Factors influencing futures of network services and their infrastructure

FIELD	LOCATION	LOCALLY-BASED FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE	EXTERNAL FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE
Public transport	Vejprty, the Czech Republic	- Demand for transport - Population in municipalities - Attractive and growing labour market - Attractive and growing tourism - Possible development of cross border public transport	- External financing from Usti region budget on transport services - The plan of transport services of Usti Region - Tendering procedures influencing the reduction of transportation costs - Development of infrastructure, traffic flows - Development of the microregion
	Saale-Orla-Kreis, Germany	- Population decline - Older population - Less rural population - Pedelecs (E-Bikes) - Possible change of trends (“green”, less car use)	- Change of paying authority GVFG - Possible change of Regionalisierungs-Mittel (see above) - Possible change of trends (“green”, less car use) - Non-state owned trains companies - Emergence of new long-distance bus network in Germany since Jan 2013
Roads	Saale-Orla-Kreis, Germany	- Renovation of important regional roads - De-activation and closure of roads with little traffic, in order to reduce maintenance costs. - Construction of bike-lanes between villages and suburbs-towns. - Possible change of trends (“green”, less car use) - People move to towns.	- Possible introduction of road pricing for cars on motorways - New PPP financing models - Changes in the GVFG (Gemeindeverkehrsfinanzierungsgesetz) - E-cars - Development of commuter subsidies

FIELD	LOCATION	LOCALLY-BASED FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE	EXTERNAL FACTORS INFLUENCING FUTURE SITUATION OF THE SERVICE AND ITS INFRASTRUCTURE
	Ljubljana, Slovenia	- Spatial plan of the Municipality of Ljubljana (2010) with the Road network plan - Payable parking zones. - Pedestrian zone in the centre of Ljubljana.	- Encouragement of the sustainable transport - Population decline in rural areas - Budget restriction for road maintenance
Water delivery and sewage treatment	Po Valley, Italy	- Social cohesion - Territorial ability to adapt to the reorganization of local autonomies, avoiding further divisions and splits - Institutional stability of ATO in relation to the reorganization of the local autonomies - Ability to adapt the choices of investment to the direct consequences of climate change already perceptible in the mountain environment - Use of simplified procedures for the realization of ordinary routine work and extraordinary maintenance of limited extent, with a preferential involvement of the local entrepreneurship	- Climate changes in the Alps related to the availability of water resources - Promotion and realization of bigger reservoirs for multiple use - National and regional politic choices about the maintenance of a public component of the investments added to the one guaranteed by the tariff, to compensate the high costs of the mountain areas that have a lower demographic density, and a more complex orography - The national and regional politics about the reorganization of the local autonomies - Simplification and streamlining of the rules about the commitments of public services and particularly the administration of the integrated water service
	Katowice, Poland	- Increase in unit price on sewage (external to the operator) - Further and radical decrease in water consumption of households - An increase in water unit price sold to the operator - Further efforts to develop monitoring and improve quality of water delivered to households - Political pressures on service effectiveness and costs	- Water stock availability in the region as well as neighbouring areas - Scale effect of metropolitan (multi-municipal) service delivery - Technological improvements further introduced to households and leading to reduction of water consumed - EU-based legal regulations on environmental protection

Source: based on data gathered and delivered by:
- National Union of Mountain Municipalities, Communities and Authorities – Piedmont Delegation
- Regional Authority of Usti Region
- Thuringian Ministry for Building, Regional Development and Infrastructure
- University of Economics in Katowice
- Urban Planning Institute of the Republic of Slovenia

Locally-based factors determining the development of local public transport are mainly based on demand-side issues. Depopulation and aging limiting the mobility of households means deceasing of demand. On the other hand the process of suburbanization generates more

needs for connections between centre and peripheries. In case of local transport important issue seems to be introduction of diversification and market-oriented solutions. External factors are based on technological changes aimed at improving the comfort of travel, environmental protection (so-called 'green transport'), and reduction of costs. Organizational and legislative changes in national and regional transport systems also may significantly influence on local public transport.

Local factors influencing in future road system could be divided into two main groups. The first one is based on changes of road system in order to improve its effectiveness. The second one takes into account the new trends in transport forcing changes in road system, such as green public transport, more trams and bike-lines. External factors determining the development of road system are based on political decision, especially related to introduction of road pricing and on the other side commuter subsidies.

In case of water and sewage sector searching for important locally-based factors focus on demand-side issues. One of the most important is continuously decline in water consumption of households. It is caused by population decline but also technological changes that helps to save waters by households. Future situation may also depends on attempts of reorganization of local authorities competencies to avoid division of water supply. The last but not least are technological improvements leading to cost reduction and quality improvement. Among the most important external factors influencing future situation in water and sewage sector are changes in water stock caused by climate changes and other environmental issues. Finally EU legal regulations on environmental protection should be taken into account.

3.5. In pursuit of drivers of future policy scenarios

Scenarios over future can be built upon general trends and key drivers of changes. It is not the aim of the publication to offer such scenarios however what may be interesting to the policy-makers is the set of potential tendencies and factors that have been identified[114] as worth further testing with regards to the future of local public service management in Central European countries.

There are various future trends that may affect social services and their infrastructure. Basically, when it comes to urban areas, we assume that future trends over social services

[114] The identified issues were conceptualized based on theoretical foundations of public service economics and management, cost analysis and finally field studies presented in chapters 1-3 of the book.

may be highly linked to standards, territorial concentration as well as funding sources. In particular, it is worth to identify whether:

- delivery of social services is to be concentrated in one or just a few multifunctional centers (sites/facilities/buildings);
- first aid (first contact, general practitioner) medical service standards are to rather rely upon national system of health care funding or private insurance market;
- fhe first aid (first contact, general practitioner) medical service standards are to rather rely upon national system of health care funding or local demographic situation and adaptation policies;
- standard of hospital services is to rely upon national system of health care funding more than just local activities and policies aimed at effectiveness and efficiency;
- public housing is to be dominantly intended for households with legally guaranteed support;
- limited number of nationally/EU-supported housing investment projects is to be implemented due to lack the capacity for co-financing in municipalities; and
- public-private housing development is to emerge as a new trend increasing the supply of public housing.

The other issue is the dynamics of changes that may be observed in urban areas offering social services. Namely, the policy-makers may question the future impacts of:

- spatial concentration of services in multifunction centers on general cost of social care delivery;
- multifunction centers on discrepancy between needs of individuals and delivered services;
- standards imposed by national health care funding system on cost of service delivery;
- local policy supporting new housing development (creating residential zones, selling land for developers, building permits) on demand for housing;
- national regulations (etc. youth support schemes for housing, standard setting, public housing financing schemes) on public expenditure to public housing;
- reduced car traffic in city centers and promotion of sustainable mobility on demand for housing in this area;

- public housing operators in cities on average floor area per public dwelling; and
- public housing operators in cities on number of public dwellings available locally.

Finally, it may be relevant for those in charge of future social service policies and their provision in urban areas to get to know economic, social and technical implications of the trends as well as the significance of the impact. This may include in particular:

- efficiency-based concentration of health care services that may shift access costs from operators to final users (who will have to cover costs of transportation, communication, etc.);
- public housing infrastructure that may be commercialised (assets will be made available as market offer for sale or lease);
- large scale passive housing projects (optionally co-funded by external sources) that may increase maintenance costs for public housing sites;
- demand on public housing that may be stimulated by labour market situation;
- mobility of young people and increasing share of single households that may increase demand for small flats supported/granted by public policy; and
- the trends introducing green technologies to housing that may reduce long term maintenance costs.

There are various future trends that may affect social services and their infrastructure. Basically, when it comes to urban areas, we assume that future trends over social services may be those described as: technologisation, concentration, financial and product diversification of services. In particular, it is worth to identify whether:

- territories affected by depopulation and ageing are to deliver social, counseling, welfare, referral and similar services mostly as e-services (e.g. remote monitoring, talks over communicators, registration to services, …);
- delivery of social services is to be concentrated in one or a few multifunctional centers (sites/facilities/buildings);
- extending the scope and improving the quality of social care services beyond the standards set by national law will be done by public service provider only while external funding is provided or customer pays extra fees; and
- new forms of children nursing services or changes in operation time are needed, due to increased possibilities in various labour schemes.

When it comes to the issue of the dynamics of changes that may be observed in rural areas offering social services, the policy-makers may question the future impacts of:

- accessibility of social care services and infrastructure for elderly people in remote territories;
- e-services with new technological interfaces (devices, communicators, mobile technologies) on the supply of social services in ageing society;
- technological trends in social services on the supply of more individualized and activation oriented as well as place-indifferent services;
- new business locations and economic development of suburban areas on the cost of supply of social services for younger generations;
- demographic change on property value of housing stock;
- demographic change on the maintenance cost of housing stock;
- demographic change on the volume of vacant housing stock;
- population shrinkage on housing vacancy and deconstructions;
- demographic change on the demand for public housing among elderly people;
- demographic change on the demand for social day care facilities among elderly people;
- availability of educational offer on the demand for housing among younger families; and
- availability of social and health service on the demand for housing among elderly people.

Economic, social and technical implications of the trends as well as the significance of the impact is to be questioned as well for the political decisions in rural areas. This may include in particular:

- ageing and distant territories that may suffer extra population outflows due to possible exclusion from social care services and infrastructure;
- national and regional governments that may subsidize mountainous or distant areas where costs of infrastructure and service provision are higher than elsewhere;
- the scope of social service that may be extended to cover needs and expectations of younger generations in order to attract them to areas suffering from or threatened by ageing;

- users of social services that may create pressure on improvement of services offered by operators and financed/managed in LAU regardless of the increase in fixed costs that is caused by demographic changes;
- the operators' costs of health care services that may be reduced due to national regulations allowing co-financing by patients;
- investments into diversification and quality of health care and social care services that may determine inverting depopulation trend; and
- the availability of jobs that may diminish housing vacancy rate.

The future trends that may affect network services and their infrastructure in urban areas may be highly linked to urbanisation, technologisation as well as funding sources. In particular, it is worth to identify whether:

- water and sewage infrastructure cost for public sector is to grow due to increased demand for land in city suburbs;
- forecasting and scenarios over the demand, dynamics and diversity of transportation services (cross border, ageing, tourism) are to gain more attention at the regional level;
- short range public transportation services are to be reduced and more funding is to be allocated to spatially concentrated park and ride infrastructure linking peripheral and depopulating areas with other parts of the country by means of medium and long range public transportation services;
- new public transportation services are to be offered only with the development of new industrial / commercial zones;
- new public transportation services are to be offered on condition that state / European funds for investments are available; and
- more elderly and handicapped are to safely use roads and pavements due to new technologies and facilities.

When it comes to the issue of the dynamics of changes that may be observed in urban areas offering network services, the policy-makers may question the future impacts of:

- the need for European funding onto the building of water and sewage infrastructure;
- pro-ecological and pro-effectiveness pressures on the consumption of water in public infrastructure (schools, hospitals, offices, etc.);

- the technological innovation in water and sewage management on operators' cost of service delivery;
- the technological innovation in water and sewage management on consumer price;
- population ageing on total water consumption in households;
- the number of stakeholders taking decisions on operation and financing of short range public transportation;
- the application of public procurement by policy-makers on cost-effectiveness of short range public transportation services;
- promotion of sustainable mobility (eco-friendly, energy efficient public transport, etc.) on the amount of investment expenditure on the development of road system;
- trends towards sustainable mobility on demand for pedestrian zones and bike lanes in city centers.

Economic, social and technical implications of the trends as well as the significance of the impact is to be questioned in urban areas. Regarding the network infrastructure and services, this may include in particular:

- the operators that may face a challenge to overtake short range public transportation services by medium and long range transportation operators in order to improve the level of cost-effectiveness of the services;
- the operators that may coordinate schedules of short range public transportation services and other transportation services in order to improve citizens' access to labour market or advanced public services;
- the operational and financial management of short range public transportation that may be centralised;
- e-services or other IT-based improvement tools targeting organization of transportation services that may be useful in achieving operators' cost-effectiveness;
- increase in commuting distance that may influence the supply of short range public transportation as a part of medium and long range public transportation service; and
- the amount of road investments that may be purely dependant on acquisition of European/national funds.

When it comes to rural areas, the future trends that may affect network services and their infrastructure may be highly linked to environmental and social trends. In particular, it is worth to identify whether:

- water and sewage per capita maintenance infrastructure cost is to grow due to diminishing number of citizens;
- the share of walking and biking is to increase significantly to become complementary to the provision of short range public transportation services; and
- selected territories in Central Europe are to be challenged by the critical decrease of existing water sources influencing water price levels.

When it comes to the issue of the dynamics of changes that may be observed in rural areas offering network services, the policy-makers may question the future impacts of:

- new technologies (e.g. environmental) imposed by European and global directives on the cost for operators of short range public transportation;
- legislative changes and state policies on the level of national/regional co-financing of public transportation service in LAU; and
- legislative changes and state policies on the level of national/regional co-financing of investments in public transportation infrastructure in LAU.

Last but not least, economic, social and technical implications of the trends as well as the significance of the impact is to be questioned in rural areas. Regarding the network infrastructure and services, this may include in particular:

- population growth that may affect the decision to decrease the price of water for users;
- water and sewage infrastructure accessibility that may determine the constant population growth;
- new techniques of delivery that may affect price of water;
- investments into water and sewage, transportation and other infrastructure (leading to its high accessibility) that may determine inverting depopulation trend;
- private (business) investments in water infrastructure that may supplement public water delivery systems;

- climate changes that may influence the increase of water prices;
- political pressure to maintain low cost of water that may create the necessity of strong interventions and increased public financing;
- tourism and demand on complementary public services that may increase the price of water;
- tendering and concessions that may impact operators to rationalize their networks of short range public transportation in depopulating areas;
- decrease in public transport offers across the depopulating areas that may increase the share of individual transportation (e.g. cars, bikes,);
- new trends in organizing/financing LAU-based public transportation (i.e. 'call a bus') that may reduce the prevailing (previous) cost of a single line;
- modernisation of railway system and operators' expansion over short range routes that may reduce the amount of bus operated short range public transportation services;
- territorial reorganization and closures of schools due to demographic change that may reduce the supply of short range public transportation services;
- deactivation of roads that may be important in controlling excessive spending for road infrastructure in depopulating areas;
- urban sprawl that may be catalysed/influenced by well-developed road system; and
- participatory budgeting and other activities incorporating citizens' engagement that may increase focus on citizens' needs for improved road system.

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Annex I. . National comparison of NUTS3 statistics on social and network services – demand and supply perspective: data availability comparison

Parameter	Objective	CZ	year	lowest level	DE	year	lowest level	HU	year	lowest level	PL	year	lowest level	SI	year	lowest level	IT	year	lowest level
Land-use changes /urban sprawl/																			
permits issued for residential buildings (total)	Classification of shrinking regions' structures regarding public service delivery	CZSO	2000-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995,2000-2009	NUTS3	KSH	2003-2010	NUTS3, NUT2	GUS	2000-2010	NUTS2, NUTS3, PL-LAU2	SLO	1995, 2000-2010	NUTS3	ISTA	2000-2008	NUTS2
permits issued for one-dwelling buildings	Classification of shrinking regions' structures regarding public service delivery	CZSO	2005-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995,2000-2009	NUTS3	KSH	2003-2010	NUTS3, NUT2	GUS	2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTA	1995, 2000-2010	NUTS2
permits issued for community residences (multi-dwelling buildings)	Classification of shrinking regions' structures regarding public service delivery	CZSO	2005-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995,2000-2009	NUTS3	KSH	2003-2010	NUTS3, NUT2	GUS	2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTA	1995, 2000-2010	NUTS2
number of purchase/sales transactions of non-residential stock	Classification of shrinking regions' structures regarding public service delivery	x	x	x	Statistisches Bundesamt	1995, 2000-2010	NUT3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2008	NUTS3, NUTS2	ISTA	2007-2010	NUTS2
number of purchase/sales transactions of non-residential stock in urban areas	Classification of shrinking regions' structures regarding public service delivery	x	x	x	Statistisches Bundesamt	1995, 2000-2010	NUT3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2008	NUTS3	x	x	
number of purchase/sales transactions of non-residential stock in rural areas	Classification of shrinking regions' structures regarding public service delivery	x	x	x	Statistisches Bundesamt	1995, 2000-2010	NUT3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2008	NUTS3	x	x	
number of purchase/sales transactions of building land	Classification of shrinking regions' structures regarding public service delivery	x	x	x	Statistisches Bundesamt	1995, 2000-2010	NUT3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2008	NUTS3	ISTA	2007-2010	NUTS2
number of purchase/sales transactions of residential building land	Classification of shrinking regions' structures regarding public service delivery	x	x	x	Statistisches Bundesamt	1995, 2000-2010	NUT3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2008	NUTS3	ISTA	2007-2010	NUTS2
avarange purchase/sales transacation value for m2 of building land	Classification of shrinking regions' structures regarding public service delivery	CZSO	2001-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995, 2000-2010	NUT3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2010	NUTS3	x	x	
avarange purchase/sales transacation value for m2 of residential building land	Classification of shrinking regions' structures regarding public service delivery	x	x	x	Statistisches Bundesamt	1995, 2000-2010	NUT3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2010	NUTS3	Piemonte	2006-2008	NUTS3

Housing																			
total dwelling stock	Comparative analysis of service and infrastructure: housing - supply side	CZSO	1995, 2000-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995, 2000-2009	NUTS3	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995-2010	NUTS2, NUTS3, PL-LAU2	SLO	2002-2010	NUTS3	ISTA	2007-2010	NUTS2
dwelling stock owned by municipalities	Comparative analysis of service and infrastructure: housing - supply side	CZSO	2001, 2011 (census)	NUTS3, NUTS2, LAU2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	1995-2010	NUTS2, NUTS3, PL-LAU2	SLO	2002	NUTS3	x	x	x
total usable floor area of dwellings [m2]	Comparative analysis of service and infrastructure: housing - supply side	CZSO	2001, 2011 (census)	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995, 2000-2009	NUTS3, LAU1	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995-2010	NUTS2, NUTS3, PL-LAU2	SLO	2002-2010	NUTS3	?	?	?
usable floor area of dwellings owned by municipalities [m2]	Comparative analysis of service and infrastructure: housing - supply side	CZSO	2001, 2011 (census)	NUTS3, NUTS2, LAU2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	1995-2010	NUTS2, NUTS3, PL-LAU2	SLO	2002	NUTS3	?	?	?
avarege usable floor area of dwellings per 1 person [m2]	Comparative analysis of service and infrastructure: housing - supply side	CZSO	2001, 2011 (census)	NUTS3, NUTS2, LAU2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	2002-2010	NUTS2, NUTS3, PL-LAU2	SLO	1995, 2002, 2004	NUTS3	?	?	?
unoccupied apartments in the municipal resource (vacant)	Comparative analysis of service and infrastructure: housing - supply side	x	x	x	x	x	x	x	x	x	GUS	2003-2005-2007-2009	PL-LAU2	x	x	x	?	?	?
total decrement in dwelling stock	Comparative analysis of service and infrastructure: housing - supply side	CZSO	2000-2010	NUTS3, NUTS2, LAU2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	2001, 2003-2010	NUTS2, NUTS3, PL-LAU1	x	x	x	?	?	?
decrement in dwelling stock owned by municipality	Comparative analysis of service and infrastructure: housing - supply side	CZSO	2001, 2011 (census)	NUTS3, NUTS2, LAU2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	2003-2010	NUTS2, NUTS3, PL-LAU1	x	x	x	?	?	?
renovation of dwellings in municiplality owned buildings [total number]	Comparative analysis of service and infrastructure: housing - supply side	x	x	x	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	2003-2005-2007-2009	NUTS2, NUTS3, PL-LAU2	x	x	x	?	?	?
total number of purchase/sales transactions of residential stock	Comparative analysis of service and infrastructure: housing - supply side	CZSO	2000-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995, 2000-2010	NUTS3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2010	NUTS3	?	?	?
number of purchase/sales transactions of residential stock in urban areas	Classification of shrinking regions' structures regarding public service delivery	CZSO	2000-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995, 2000-2010	NUTS3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2010	NUTS3	?	?	?

number of purchase/sales transactions of residential stock in rural areas	Classification of shrinking regions' structures regarding public service delivery	CZSO	2000-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995, 2000-2010	NUTS3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2010	NUTS3	?	?	?
avarange purchase/sales transacation price for m2 of residential stock	Classification of shrinking regions' structures regarding public service delivery	CZSO	2000-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995, 2000-2010	NUTS3, NUTS2	x	x	x	GUS	2003-2010	NUTS2	SLO	2007-2010	NUTS3	?	?	?
Demand level & consumption																			
revenues from dues, waste-water management and water protection	Comparative analysis of service and infrastructure: water provision - demand side	CZSO	2003-2010	NUT3, NUTS2	Statistisches Bundesamt	1995	NUTS3	x	x	x	x	x	x	?	?	?	Piemonte	2000-2010	NUTS3, NUTS2
revenue from dues, waste management	Comparative analysis of service and infrastructure: water provision - demand side	?	?	?	x	x	x	x	x	x	x	x	x	?	?	?	Piemonte	2000-2010	NUTS3, NUTS2
number of persons per bed in general hospitals	Comparative analysis of service and infrastructure: healthcare - demand side	CZSO	2000-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	1995, 2000-2003	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	2003-2010	NUTS3	SLO	2001, 2004, 2009	NUTS3	?	?	?
persons using social assistance benefits per 10 thous. capita	Comparative analysis of service and infrastructure: social care - demand side	CZSO	1995,2000-2010	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	2000-2010	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	2008-2010	NUTS2	?	?	?	Piemonte	2007-2009	NUTS3, NUTS2
consumption per capita, water from water-line system	Comparative analysis of service and infrastructure: water provision - demand side	CZSO	2003-2010	NUT3, NUTS2	Statistisches Bundesamt	1998, 2001,2004,2007	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	2002-2010	NUTS2, NUTS3, PL-LAU2	SLO	2002-2010	NUTS3	ISTA	2000-2010	NUTS3, NUTS2
consumption per capita, gas from gas-line system	Classification of shrinking regions' structures regarding public service delivery	ERO	2004-2010	NUT3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	2002-2010	NUTS2, NUTS3, PL-LAU2	?	?	?	ISTA	2006-2010	NUTS3, NUTS2
Supply level & cost (expenditures)																			
local government (LAU 1 & LAU 2) expenditure on education, current expenditure total	Comparative analysis of service and infrastructure: education - supply side	YRGB?	2003-2010	NUTS3, NUTS2	Statistisches Bundesamt	1995, 2000-2001	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS3, NUTS2

local government (LAU 1 & LAU 2) expenditure on education, assets-related spending, total	Comparative analysis of service and infrastructure: education - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on education, investment assets-related spending	Comparative analysis of service and infrastructure: education - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on health care, current expenditure total	Comparative analysis of service and infrastructure: healthcare - supply side	YRGB?	2003-2010	NUTS3, NUTS2	Statistisches Bundesamt	1995, 2000-2001	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on health care, assets-related spending, total	Comparative analysis of service and infrastructure: healthcare - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on health care, investment assets-related spending	Comparative analysis of service and infrastructure: healthcare - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on transport and communication (roads), current expenditure total	Comparative analysis of service and infrastructure: transportation - supply side	YRGB	2003-2010	NUTS3, NUTS2	Statistisches Bundesamt	1995, 2000-2001	NUTS3, NUTS2	KSH	1995, 2000-2009	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on transport and communication (roads), assets-related spending, total	Comparative analysis of service and infrastructure: transportation - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on transport and communication (roads), investment assets-related	Comparative analysis of service and infrastructure: transportation - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2

spending																			
local government (LAU 1 & LAU 2) expenditure on transport and communication (public transportation), current expenditure total	Comparative analysis of service and infrastructure: transportation - supply side	YRGB	2003-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on transport and communication (public transportation), assets-related spending, total	Comparative analysis of service and infrastructure: transportation - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on transport and communication (public transportation), investment assets-related spending	Comparative analysis of service and infrastructure: transportation - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2
local government (LAU 1 & LAU 2) expenditure on social care and other tasks of social policy, current expenditure total	Comparative analysis of service and infrastructure: social care - supply side	YRGB	2003-2010	NUTS3, NUTS2	Statistisches Bundesamt	1995, 2000-2001	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
local government (LAU 1 & LAU 2) expenditure on social care and other tasks of social policy, assets-related spending, total	Comparative analysis of service and infrastructure: social care - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
local government (LAU 1 & LAU 2) expenditure on social care and other tasks of social policy,	Comparative analysis of service and infrastructure: social care - supply side	YRGB?	2003-2010	NUTS3	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x

investment assets-related spending																			
collective water supply systems, service lines to buildings in km	Comparative analysis of service and infrastructure: water provision - supply side	CZSO	2003-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
collective water supply systems, service lines to buildings in pcs	Comparative analysis of service and infrastructure: water provision - supply side	CZSO	2003-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
water purification plants	Comparative analysis of service and infrastructure: water provision - supply side	CZSO	2003-2010	NUTS3, NUTS2	Statistisches Bundesamt	1998, 2001, 2004	NUTS3, NUTS2	x	x	x	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	Piemonte	2009	NUTS2
collective sewerage system, building sewers in km	Comparative analysis of service and infrastructure: water provision - supply side	CZSO	2003-2010	NUTS3, NUTS2	Statistisches Bundesamt	1998, 2001, 2004, 2007	NUTS3, NUTS2	KSH	2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
collective sewerage system, building sewers in pcs	Comparative analysis of service and infrastructure: water provision - supply side	CZSO	2003-2010	NUTS3, NUTS2	Statistisches Bundesamt	1998, 2001, 2004, 2007	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
collective waste water treatment plants	Comparative analysis of service and infrastructure: water provision - supply side	ISSAR, CZSO	2000-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
collective waste water treatment plants, throughput	Comparative analysis of service and infrastructure: water provision - supply side	ME?	1995, 2000-2010	NUTS3, NUTS2	Statistisches Bundesamt	1998, 2001, 2004, 2007	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
individual rural waste water treatment plants	Comparative analysis of service and infrastructure: water provision - supply side	CZSO	2001, 2011 (census)	NUTS3, NUTS2, LAU2	Statistisches Bundesamt	2007	NUT3	x	x	x	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
landfill sites	Comparative analysis of service and infrastructure: waste management - supply side	CENIA-ISSAR?	1995,2000-2010	NUTS3, NUTS2	Statistisches Bundesamt	2001-2009	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	ISTAT	1995, 2000-2010	NUTS2

landfill sites, area	Comparative analysis of service and infrastructure: waste management - supply side	CENIA-ISSAR?	1995,2000-2010	NUTS3, NUTS2	Statistisches Bundesamt	2001-2010	NUT3	x	x	x	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
expenditures on water management, outlays per capita	Comparative analysis of service and infrastructure: water provision - supply side	?	?	?	x	x	x	x	x	x	x	x	x	SLO	2001-2010	NUTS3	x	x	x
outlays on fixed assets expenditures on water management, total	Comparative analysis of service and infrastructure: water provision - supply side	?	?	?	x	x	x	x	x	x	x	x	x	SLO	2001-2010	NUTS3	x	x	x
outlays on fixed assets expenditures on water management, construction and modernisation of water treatment plants	Comparative analysis of service and infrastructure: water provision - supply side	?	?	?	x	x	x	x	x	x	x	x	x	SLO	2001-2010	NUTS3	x	x	x
expenditure on environmental protection and water management, sewerage system discharging sewage	Comparative analysis of service and infrastructure: water provision - supply side	CZSO, CENIA-ISSAR	1995,2000-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	x	x	x	SLO	2001-2010	NUTS3	x	x	x
expenditure on environmental protection and water management, sewerage system discharging rainwater	Comparative analysis of service and infrastructure: water provision - supply side	?	?	?	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	x	x	x	x	x	x	x	x	x
expenditure on environmental protection and water management, municipal waste water treatment plants	Comparative analysis of service and infrastructure: water provision - supply side	?	?	?	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	x	x	x	x	x	x	x	x	x
expenditure on recycling and utilization of waste	Comparative analysis of service and infrastructure: waste management - supply side	CENIA-ISSAR?	2002-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	x	x	x	SLO	2001-2010	NUTS3	x	x	x
beds in general hospitals per 10	Comparative analysis of service and	HY	2000-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-	NUTS3, NUTS2,	GUS	2002-2010	NUTS3	SLO	2001, 2004,	NUTS3	x	x	x

thous. population	infrastructure: healthcare - supply side								2010	LAU2					2009				
beds in general hospitals	Comparative analysis of service and infrastructure: healthcare - supply side	HY	2000-2010	NUTS3, NUTS2	Statistisches Bundesamt	1995, 2000-2009	NUTS3, NUTS2	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	2002-2010	NUTS3	SLO	2001, 2004, 2009	NUTS3	ISTAT	1995, 2000-2010	NUTS2
out-patient departments, health centres, departments – subordinated to local self-government, total	Comparative analysis of service and infrastructure: healthcare - supply side	HY	2000-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	x	x	x	x	x	x	x	x	x
distribution network per 100 km2, water-line system	Comparative analysis of service and infrastructure: water provision - supply side	CZSO	2003-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
distribution network per 100 km2, sewerage system	Comparative analysis of service and infrastructure: water provision - supply side	CZSO	2003-2010	NUTS3, NUTS2	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x
distribution network per 100 km2, gas-line system	Classification of shrinking regions' structures regarding public service delivery	?	?	?	x	x	x	KSH	1995, 2000-2010	NUTS3, NUTS2, LAU2	GUS	1995, 2000-2010	NUTS2, NUTS3, PL-LAU2	x	x	x	x	x	x

Annex II. Exemplary field study guideline

FIELD: WATER AND SEWAGE

Executive Summary

The report aims at delivering common methodology of investigating field studies in WP3.2 of the project. The field studies have been set-up by the partnership in order to enable better understanding of changes in infrastructure and service costs related to demographic changes. The activity based on this document (deliverable 3.2.1) contributes to microeconomic analysis of sample cases in infrastructure and service provision in shrinking regions, comparative in groups of two-three LAU1 and/or LAU2 cases. It is worth pinpointing that sample cases will be reviewed referring to trends and tendencies with wide context analysis. Direct price comparisons would not be recommended as they might result in misleading estimations and conclusions.

According to AF, the partnership provides knowledge on six field studies. These are:

- housing (PP 10 – task force leader, PP 4, PP 13)
- public transport (LP – task force leader, PP 2, PP 5)
- roads (LP – task force leader, PP 2, PP 13)
- water (PP 10 – task force leader, PP 9)
- social care (PP 8 – task force leader, PP 9, PP 11)
- health care (PP 11 – task force leader, PP 8)

Six separate, tailor-made parts of methodology has been elaborated and these guidelines refer to field study in water and sewerage.

Every partner is requested to provide data and description regarding selected LAU only and fill-in this template and accompanying Excel file. Every partner selects only one LAU1 (i.e. equivalent of poviat, kreis, county, …) or LAU2 (i.e. equivalent of city, community, …) for field study description.

The additional role of task force leaders is to monitor progress in September 2012 – January 2013 and deliver results of work (Word and Excel files) to PP10.

Partners will need to inquire for the listed data/indicators at LAU administration and service operators (personal interviews, desk research, surveys, queries, phone calls, etc.) The activities are eligible under WP3 staff costs.

The document has been arranged according to four interlinked parts. Part I deals with public service overview. It pinpoints national and local contexts of service organisation and delivery necessary to understand the economics of public services in scrutiny. Part II reviews main economic data and indicators. It consists of worksheet prepared in Excel and a descriptive part. Part III focuses on quality of services and its political, social, technological and spatial determinants. It provides an enhanced picture of the economy of service in scrutiny. Finally, part IV brings conclusions on service provision towards WP3.3 and WP5.

Introduction

As the territorial context matters for identifying the performance of services, we kindly ask you to briefly present the territory that is the subject of your field study. Note that every partner selects only one LAU1 (i.e. equivalent of poviat, kreis, county, …) or LAU2 (i.e. equivalent of city, community, …) for description.

Tab.1. FIELD STUDY AREA	
Name of the territorial unit (LAU 1, LAU2)	Katowice

Tab.2. ECONOMY			
Dominant sectors of economy (*mark max two boxes for each year*) based on employment	2000	2005	2010
– Agriculture, forestry and fishing (NACE Rev 2. – code A)	☐	☐	☐
– Services (NACE Rev 2. – codes F-U)	X	X	X
– Industry (NACE Rev 2. – codes B-E, including C)	☐	☐	☐

Tab.3. SPATIAL ISSUES			
Dominant land use patterns (*mark one box only per question*)			
– what is the level of urbanisation?	high x	medium ☐	low ☐
– what is the dominant structure of settlement?	monocentric ☐	polycentric x	
– what is the dominant type of spatial concentration of economic activities?	large industrial zones ☐	old industrial areas located within urban tissue x	micro firms and SMEs located across the territory ☐
– what are key amenities of the territory?	leisure (sport) area/s ☐	culture area/s ☐	green space/s ☐
	health resort ☐	science and education area/s ☐	other - metropolitan ☐

Part I. Public service overview – water and sewerage factsheet

Public service overview provided in this part is thought as a starting point for understanding the national and local context of infrastructure and service provision in your shrinking region.

Tab.4. GENERAL FACTSHEET: NATIONAL CONTEXT	
What are the key national frameworks that impose or facilitate certain activities in water and sewerage management on local governments?	……..
What are the implications of the above mentioned frameworks?	

– organization of water and sewerage system on local level	……..
– financing water and sewerage system on local level	……..
– maintenance of water and sewerage system on local level (standards, technical issues, specific regulations, …)	……..
– other	……..
What is the national framework concerning contracting out by local/regional governments to private sector?	……..
What is the historical setting of water and sewerage system? Massive privatisations, communalisation of assets, etc.	……..
How the above mentioned facts allow to react to depopulation issues?	……..

Tab.5. PRODUCT DESCRIPTION AND PRODUCTION CHAIN - LOCAL (SELECTED LAU) CONTEXT	
What is the ownership structure of water and sewerage system in LAU?	……..
What products are offered as water and sewerage system in LAU? Provide basic information regarding types of water and sewerage infrastructure; describe characteristics of network.	……..
Are there any e-services linked to water and sewerage system? (metering, customer service, etc.)	……..
Are water delivery and sewerage treatment systems affected by spatial and/or social changes in LAU area? What are the particular challenges?	……..
How the above mentioned facts allow to react to depopulation issues?	……..

Tab.6. MANAGEMENT AND FINANCING - LOCAL (SELECTED LAU) CONTEXT	
What are the operational agents (operators) responsible for management of water and sewerage? Who sets the rules of operations?	……..
How does the financing of water and sewerage system take place?	……..
What are the pricing schemes in water and sewerage system (the price of services)?	……..
How the above mentioned facts allow to react to depopulation issues?	……..

Tab.7. STANDARDS AND TECHNOLOGY: LOCAL (SELECTED LAU) CONTEXT	
What were the main actions taken by policy-makers to upgrade the standard of water and sewerage systems in LAU in last 5-10 years?	……..
What are the key technical challenges that influence LAU-related water and sewerage systems?	……..
How the above mentioned facts allow to react to depopulation issues?	……..

Tab.8. LOCALISATION - LOCAL (SELECTED LAU) CONTEXT	
What are the dominant terrain related issues that influence the organisation of water and sewerage systems (hills, dry areas, building density, etc.)	……..
Are there any areas not covered/insufficiently covered by water and sewerage networks in LAU? Name reasons.	……..

Part II. The economics of water

The part of the study related to the economics of water and sewerage systems is based upon scrutiny of data and indicators. We kindly ask you to present the information requested in attached Excel file. The data requested covers the timeframe: 2000-2002-2004-2006-2008-2010. Please provide data on the territorial unit of your field study only.

In order to complete the study you are strongly advised to inquire for the listed data/indicators at your LAU administration and service operators.

The data requested for water in the core part of the study is as follows:

A BASIC DATA

- A01 Population (thousands)
- A02 Area (sq km)
- A03 Budget income per capita (EUR/person)
- A04 Budget debt ratio (%)

F FINANCE

- F01 Total operators' expenditure on water provision (thousand national currency)
- F02 Total operators' revenues on water provision (thousand national currency)
- F03 Operators' revenues on water from households (core service sold - revenue on invoices) (thousand national currency)
- F04 Operators' revenues on water from companies (core service sold - revenue on invoices) (thousand national currency)
- F05 Operators' investments expenditure on water provision (thousand national currency)
- F06 Operators' operational costs on water provision (thousand national currency)
- F07 Operators' repair and maintenance costs on water provision (thousand national currency)
- F08 Subsidies of LAU local government to households water provision (thousand national currency)
- F09 Total operators' expenditure on sewerage (thousand national currency)
- F10 Total operators' revenues on sewerage (thousand national currency)
- F11 Operators' revenues on sewerage from households (core service sold - revenue on invoices) (thousand national currency)
- F12 Operators' revenues on sewerage from companies (core service sold - revenue on invoices) (thousand national currency)
- F13 Operators' investment expenditure on sewerage (thousand national currency)
- F14 Operators' operational costs on sewerage (thousand national currency)
- F15 Operators' repair and maintenance costs on sewerage (thousand national currency)
- F16 Subsidies of LAU local government to households sewerage (thousand national currency)

CV CUSTOMERS AND VOLUME

- CV01 Number of households in water network (thousand)
- CV02 Number of households in sewerage network (thousand)
- CV03 Length of water network (km)
- CV04 Length of sewerage network (km)
- CV05 Total amount of distributed water to households (thousands m3)
- CV06 Total amount of treated sewerage from households (thousands m3)
- CV07 Total amount of distributed water to companies (thousands m3)
- CV08 Total amount of treated sewerage from companies (thousands m3)

The Excel file is pre-formatted so **the following cost indicators of services and infrastructure** that are listed below should be automatically calculated based on your inputs. Please do not change the formulas and formatting, especially green marked cells.

I COST INDICATORS OF SERVICES AND INFRASTRUCTURE

- I01 Return on water [(F02-F01)/F02]
- I02 Return on sewerage [(F10-F09)/F10]
- I03 Cost of water provision per km [F01/CV03]
- I04 Cost of water provision per thousand m3 [F01/(CV05+CV07)]
- I05 Cost of sewerage treatment per km [F09/CV04]
- I06 Cost of sewerage treatment per thousand m3 [F09/CV06+CV08]
- I07 Share of operational costs on water in total expenditure on water [F06/F/01]
- I08 Share of operational costs on sewerage in total expenditure on sewerage [F14/F/09]
- I09 Share of repair and maintenance costs on water in total expenditure on water [F07/F/01]
- I10 Share of repair and maintenance costs on sewerage in total expenditure on sewerage [F15/F/09]
- I11 Share of subsidies to households on water in sales of water [F08/F03]
- I12 Share of subsidies to households on sewerage in sales of sewerage services [F16/F11]
- I13 Intensity of water network [CV01/CV03]
- I14 Intensity of sewerage network [CV02/CV04]

Picture. 1. Exemplary screenshot: cost indicators of services and infrastructure - Excel file template

ADAPT2DC
FIELD STUDY TEMPLATE
Guidelines for Project Partners concerning WP3.2.2 implementation
HOUSING

Code	Data	2000	2002	2004	2006	2008	2010
A	BASIC DATA						
A01	Population (thousands)	0,00	0,00	0,00	0,00	0,00	0,00
A02	Area (sq km)	0,00	0,00	0,00	0,00	0,00	0,00
A03	Budget income per capita (EUR/person)	0,00	0,00	0,00	0,00	0,00	0,00
A04	Budget debt ratio (%)	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
F	FINANCE						
F01	Expenditure on public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F02	Expenditure on social public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F03	Expenditure on non-social public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F04	Revenues on public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F05	Revenues on social public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F06	Revenues on non-social public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F07	Operational costs on public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F08	Operational costs on social public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F09	Operational costs on non-social public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
F10	Repair and maintenance cost in public housing (thousand national currency)	0,00	0,00	0,00	0,00	0,00	0,00
CV	CUSTOMERS AND VOLUME						
CV01	Number of people living in public housing (person)	0	0	0	0	0	0
CV02	Number of people living in social public housing	0	0	0	0	0	0
CV03	Number of people living in non-social public housing	0	0	0	0	0	0
CV04	Total square meters of public housing (thousand sq m)	0,00	0,00	0,00	0,00	0,00	0,00

The data provided constitutes the basis for detailed analyses and in particular, the following investigation paths should be considered to evidence the changes in costs of services and infrastructure in water and sewerage:

- **Return on water (I01)** describes the level of profitability or deficit in financing of water provision. The change of the values basically depends on costs (F01) / revenues (F02). Here the question is if it is particularly related to changes of: A01, CV01, CV03, CV05, CV07 or any contextual information written in parts: I and III.
- **Return on sewerage (I02)** describes the level of profitability or deficit in financing of sewerage treatment. The change of the values basically depends on costs (F09) / revenues (F10). Here the question is if it is particularly related to changes of: A01, CV02, CV04, CV06, CV08 or any contextual information written in parts: I and III.
- **Cost of water provision per km (I03)** describes the operators' average cost of water per km of water network. The change of the values basically depends on costs (F01) / length of water network (CV03). Here the question is if it is particularly related to changes of: A01, F05, CV01, CV05 or any contextual information written in parts: I and III.
- **Cost of water provision per thousand m3 (I04)** describes the operators' average cost of water per delivered m3. The change of the values basically depends on costs (F01) / amount of water delivered to households and business (CV05, CV07). Here the question is if it is particularly related to changes of: A01, F05, CV03, CV05 or any contextual information written in parts: I and III.

- **Cost of sewerage treatment per km (I05)** describes the operators' average cost of sewerage per km of sewerage network. The change of the values basically depends on costs (F09) / length of sewerage network (CV04). Here the question is if it is particularly related to changes of: A01, F13, CV06, CV08 or any contextual information written in parts: I and III.
- **Cost of sewerage treatment per thousand m3 (I06)** describes the operators' average cost of sewerage per m3 treated sewerage. The change of the values basically depends on costs (F09) / amount of sewerage (CV06, CV08). Here the question is if it is particularly related to changes of: A01, F13, CV04 or any contextual information written in parts: I and III.
- **Share of operational costs on water provision in total expenditure on water provision (I07)** describes the level of variable costs in overall spending on water provision. The change of the values basically depends on operational costs on water provision (F06) and total operators' expenditure (F01). Here the question is if it is particularly related to changes of: A01, CV01, CV03, CV05, CV07 or any contextual information written in parts: I and III.
- **Share of operational costs on sewerage treatment in total expenditure on sewerage treatment (I08)** describes the level of variable costs in overall spending on sewerage. The change of the values basically depends on operational costs on sewerage treatment (F14) and total operators' expenditure (F09). Here the question is if it is particularly related to changes of: A01, CV02, CV04, CV06, CV08 or any contextual information written in parts: I and III.
- **Share of repair and maintenance cost on water provision in total expenditure on water provision (I09)** describes the level of technical usage of water network. The change of the values basically depends on repair and maintenance costs on water provision (F07) and total operators' expenditure (F01). Here the question is if it is particularly related to changes of: A01, F05, F08, CV01, CV03, CV05, CV07 or any contextual information written in parts: I and III.
- **Share of repair and maintenance cost on sewerage treatment in total expenditure on sewerage treatment (I10)** describes the level of technical usage of sewerage network. The change of the values basically depends on repair and maintenance costs on sewerage treated (F15) and total operators' expenditure (F09). Here the question is if it is particularly related to changes of: A01, F13, F16, CV02, CV04, CV06, CV08 or any contextual information written in parts: I and III.
- **Share of subsidies to households on water in sales of water (I11)** describes public intervention intensity towards water provision. The change of the values basically depends on the level of subsidies to water system (F08) and operators' revenues from sales to households (F03). Here the question is if it is particularly related to changes of: A01, A03, A04, CV01, CV05 or any contextual information written in parts: I and III.
- **Share of subsidies to households on sewerage in sales of sewerage services (I12)** describes public intervention intensity towards water provision. The change of the values basically depends on the level of subsidies to water system (F16) and operators' revenues from sales to households (F11). Here the question is if it is particularly related to changes of: A01, A03, A04, CV02, CV06 or any contextual information written in parts: I and III.
- **Intensity of water network (I13)** describes spatial compactness of service delivery. The change of the values basically depends on number of households using water (CV01) and length of water network (CV03). Here the question is if it is particularly related to changes of: A01, F05, I03 or any contextual information written in parts: I and III.
- **Intensity of sewerage network (I14)** describes spatial compactness of service delivery. The change of the values basically depends on number of households connected to sewerage network (CV02) and length of sewerage network (CV04). Here the question is if it is particularly related to changes of: A01, F13, I04 or any contextual information written in parts: I and III.

Consequently, the investigation paths are to be illustrated by graphical charts.

Part III. Qualitative setting of water

Not just the economy serves as the driving force behind the water and sewerage services. There are more factors that influence water and sewerage systems. Please do provide us with local ***qualitative information*** *on finance and customers volume. The requested information concerns* ***the territorial unit of your field study only****.*

We kindly ask you to write short ***information on factors having impact on water and sewerage systems in last 5-10 years****. Are there any issues worth particular attention: frequent* ***political*** *changes or strategic plan implementations;* ***citizen*** *pressures, bottom-up initiatives;* ***technological*** *standards upgrades/downgrades of infrastructure; changes in urban land use or other* ***spatial*** *processes.*

Please refer to indicators listed in Part II and provide short narrative text.

Tab.9. KEY ISSUES IN FINANCING OF WATER / SEWERAGE SERVICES AND INFRASTRUCTURE
What are the key qualitative issues that influenced changes in financing of water and sewerage services and infrastructure in terms of political, social, technological and spatial issues?

Issue type	Factor name (minimum 4 words per factor)	Description (narrative text – max. 1000 characters)
political issues	–	
	–	
	–	
social issues	–	
	–	
	–	
technology issues	–	
	–	
	–	
spatial issues	–	
	–	
	–	

Tab.10. KEY ISSUES IN CUSTOMER VOLUME OF WATER / SEWERAGE SERVICES AND INFRASTRUCTURE		
What are the key qualitative issues that influenced changes in customer volume regarding water and sewerage services and infrastructure in terms of political, social, technological and spatial issues?		
Issue type	**Factor name (minimum 4 words per factor)**	**Description (narrative text – max. 1000 characters)**
political issues	–	
	–	
	–	
social issues	–	
	–	
	–	
technology issues	–	
	–	
	–	
spatial issues	–	
	–	
	–	

Part IV. Conclusions on past, present and future of water

Tab.11. CONCLUSIONS PAST, PRESENT AND FUTURE - WATER / SEWERAGE SERVICES AND INFRASTRUCTURE
Are the decisions taken by various stakeholders in LAU mainly driven by economy or policy? How is it linked to demographic changes? (description: narrative text min. 1000 /max. 2500 characters)
……..
Is the supply of service linked more to upgrading standards (quality) or improving accessibility (quantity) of service? How is it linked to demographic changes? (description: narrative text min. 1000 /max. 2500 characters)
……..
Name <u>five local factors</u> that will determine the situation regarding water / sewerage service and infrastructure <u>in next 5-10 years</u>?
1. .. 2. .. 3. .. 4. .. 5. ..
Name <u>five external factors</u> (outside LAU) that will determine the situation regarding water / sewerage service and infrastructure <u>in next 5-10 years</u>?
1. .. 2. .. 3. .. 4. .. 5. ..

Contact person in the task force and contributors

SURNAME NAME	ORGANISATION	EMAIL	PHONE
Contact person			
Contributors			

Annex III. Glossary on indicators

Social infrastructure: cost analysis – ratios and investigation paths

Study field: social care

Code	Data
A	BASIC DATA
A01	Population (thousands)
A02	Area (sq km)
A03	Budget income per capita (EUR/person)
A04	Budget debt ratio (%)
F	**FINANCE**
F01	Total expenditure on LAU-managed social care (thousand national currency); excl. creche expend.
F02	Total investment expenditure on LAU-managed social care (thousand national currency); excl. creche expend.
F03	Total maintenance and repair expenditure on LAU-managed social care (thousand national currency); excl. creche expend.
F04	Total operational expenditure on LAU-managed social care (thousand national currency); excl. creche expend.
F05	Total expenditure on direct subsidies paid to people under social care (thousand national currency); excl. creche expend.
F06	Total expenditure on LAU-managed creche/day nursery (thousand national currency)
F07	Total investment expenditure on LAU-managed creche/day nursery (thousand national currency)
F08	Total maintenance and repair expenditure on LAU-managed creche/day nursery (thousand national currency)
F09	Total operational expenditure on LAU-managed creche/day nursery (thousand national currency)
F10	Subsidies granted to LAU on social care (thousand national currency)
F11	Subsidies granted to LAU on creche/day nursery (thousand national currency)
CV	**CUSTOMERS AND VOLUME**
CV01	Number of people using social care infrastructure and non-financial service (thousand persons)
CV02	Number of people granted financial aid under social care scheme (thousand persons)
CV03	Number of children in creche/day nursery (persons)
CV04	Number of places available in creche/day-nursery
CV05	Economically active population (thousand persons)
I	**COST INDICATORS OF SERVICES AND INFRASTRUCTURE**
I01	Average cost of social care per beneficiary [F01/(CV01+CV02)]
I02	Average cost of social care per citizen [F01/A01]
I03	Average aid cost per beneficiary of financial social care [F05/CV02]
I04	Average cost of social care per beneficiary of social care infrastructure and non-financial service [(F02+F03+F04)/CV01]
I05	Share of external social care subsidies in LAU total expenditure on social care [F10/F01]
I06	Average cost of creche/day nursery per kid [F06/CV03]
I07	Vacancy rate of creche/day nursery service [CV03/CV04]
I08	Share of external creche subsidies in LAU total expenditure on creche/day nursery [F11/F06]

Average cost of social care per beneficiary (I01) describes the average cost of overall financial and non-financial services (but crèche) delivered to beneficiaries. The change of the values basically depends on costs (F01) and number of served beneficiaries (CV01, CV02). Here the question is if it is particularly related to changes of: A01, F10. CV05.

Average cost of social care per citizen (I02) describes the average cost of social care (but crèche) for community. The change of the values basically depends on costs (F01) and number of citizens (A01). Here the question is if it is particularly related to changes of: A03, A04, CV01, CV02, F10.

Average aid cost per beneficiary financial social care (I03) describes the average cost of financial subsidies delivered to beneficiaries. The change of the values basically depends on expenditure on subsidies (F05) and number of people granted financial aid (CV02). Here the question is if it is particularly related to changes of: A01, F10. CV05.

Average cost of social care per beneficiary of social care infrastructure and non-financial service (I04) describes the average cost of social care infrastructure and non-financial services delivered to beneficiaries. The change of the values basically depends on costs (F02, F03, F04) and number of served beneficiaries (CV01). Here the question is if it is particularly related to changes of: A01, F10. CV05.

Share of external social care subsidies in LAU total expenditure on social care (I05) describes the level of social care burden over community compared to accessible and due external financing. The ratio basically depends on subsidies granted to LAU (F10) and total expenditure on social care (F01). Here the question is if it is particularly related to changes of: A01, CV01, CV02, CV05.

Average cost of crèche/day nursery per kid (I06) describes average cost of crèche per beneficiary. The change of the values basically depends on costs of LAU-managed crèche/day nursery (F06) and number of children served with the service (CV03). Here the question is if it is particularly related to changes of: A01, F07, F11, CV04.

Vacancy rate of crèche/day nursery service (I07) describes the load on crèche services. The change of the values basically depends on number of children in crèche (CV03) and capacity of infrastructure (CV04). Here the question is if it is particularly related to changes of: A01, F07, F11, CV05.

Share of external crèche subsidies in LAU total expenditure on crèche/day nursery (I08) describes the level of crèche delivery burden over community compared to accessible and due external financing. The ratio basically depends on subsidies granted to LAU (F11) and total expenditure on day nursery (F06). Here the question is if it is particularly related to changes of: A01, CV03, CV04.

Study field: health care

A	**BASIC DATA**
A01	Population (thousands)
A02	Area (sq km)
A03	Budget income per capita (EUR/person)
A04	Budget debt ratio (%)
F	**FINANCE**
F01	Total operators' expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)
F02	Operators' investment expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)
F03	Operators' maintenance and repair expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)
F04	Operators' operational expenditure (doctors, first-aid medical services) on health care in LAU (thousand national currency)
F05	Total operators' expenditure (hospitals) on health care in LAU (thousand national currency)
F06	Operators' investment expenditure (hospitals) on health care in LAU (thousand national currency)
F07	Operators' maintenance and repair expenditure (hospitals) on health care in LAU (thousand national currency)
F08	Operators' operational expenditure (hospitals) on health care in LAU (thousand national currency)
F09	Operators' "market" revenues (doctors, first-aid medical services) on health care in LAU (thousand national currency)
F10	Operators' "market" revenues (hospitals) on health care in LAU (thousand national currency)
F11	Subsidies granted by national health system to (doctors, first-aid medical services) operators on health care (thousand national currency)
F12	Subsidies granted by national health system to (hospitals) operators on health care (thousand national currency)
F13	Subsidies granted by LAU to (doctors, first-aid medical services) operators on health care (thousand national currency)
F14	Subsidies granted by LAU to (hospitals) operators on health care (thousand national currency)
CV	**CUSTOMERS AND VOLUME**
CV01	Number of patients using doctors/first-aid medical services (thousand persons)
CV02	Number of patients in hospitals (thousand persons)
CV03	Number of doctors in first-aid medical services (persons)
CV04	Number of beds in hospitals (units)
CV05	Deaths (persons)
I	**COST INDICATORS OF SERVICES AND INFRASTRUCTURE**
I01	Average total cost of doctors/first-aid medical services per patient [F01/CV01]
I02	Average total cost of hospitals services per patient [F05/CV02]
I03	Average total cost of doctors/first-aid medical services per citizen [F01/A01]
I04	Average total cost of hospitals services per citizen [F05/A01]
I05	Average investment cost of doctors/first-aid medical services per citizen [F02/A01]
I06	Average investment cost of hospitals services per citizen [F06/A01]
I07	Average maintenance, repair and operational costs of doctors/first-aid medical services per patient [(F03+F04)/CV01]
I08	Average maintenance, repair and operational costs of hospital services per patient [(F07+F08)/CV02]
I09	Share of operators' investment expenditure in operators' total expenditure (doctors, first-aid medical services) on health care in LAU [F02/F01]
I10	Share of operators' investment expenditure in operators' total expenditure (hospitals) on health care in LAU [F06/F05]
I11	Share of all subsidies granted to operators on health care (doctors, first-aid medical services) in total operators' expenditure [(F11+F13)/F01]
I12	Share of all subsidies granted to operators on health care (hospitals) in total operators' expenditure [(F12+F14)/F05]
I13	Number of citizens per doctor in first-aid medical services (thousands/doctor) [CV03/A01]
I14	Number of citizens per bed in hospitals (thousands/bed) [CV04/A01]

Average cost of doctors/first-aid medical services per patient (I01) describes the average cost of overall non-specialist doctors/first-aid medical services delivered to patients. The change of the values basically depends on costs (F01) and number of served beneficiaries (CV01). Here the question is if it is particularly related to changes of: A01, F02, CV03.

Average cost of hospitals services per patient (I02) describes the average cost of overall non-specialist hospitals services delivered to patients. The change of the values basically depends on costs (F05) and number of served beneficiaries (CV02). Here the question is if it is particularly related to changes of: A01, F06, CV04.

Average cost of doctors/first-aid medical services per citizen (I03) describes the average cost overall non-specialist doctors/first-aid medical services for community. The change of the values basically depends on costs (F01) and number of citizens (A01). Here the question is if it is particularly related to changes of: CV01, CV03, F11, F13.

Average cost of hospitals services per citizen (I04) describes the average cost overall non-specialist hospitals services for community. The change of the values basically depends on costs (F05) and number of citizens (A01). Here the question is if it is particularly related to changes of: CV02, CV04, F12, F14.

Average investment cost of doctors/first-aid medical services per citizen (I05) describes the technical upgrade of doctors/first-aid medical services and infrastructure. The change of the values basically depends on investment expenditure (F02) and number of citizens (A01). Here the question is if it is particularly related to changes of: CV01, F11, F13.

Average investment cost of hospitals services per citizen (I06) describes the technical upgrade of hospitals services and infrastructure. The change of the values basically depends on investment expenditure (F06) and number of citizens (A01). Here the question is if it is particularly related to changes of: CV02, F12, F14.

Average maintenance, repair and operational costs of doctors/first-aid medical services per patient (I07) describes the average non-investment cost of doctors/first-aid medical service per patient. The change of the values basically depends on repair and operational as well as maintenance expenditure (F03, F04) and number of patients (CV01). Here the question is if it is particularly related to changes of: A01, F09, CV03.

Average maintenance, repair and operational costs of hospitals services per patient (I08) describes the average non-investment cost of hospitals service per patient. The change of the values basically depends on repair and operational as well as maintenance expenditure (F07, F08) and number of patients (CV02). Here the question is if it is particularly related to changes of: A01, F10. CV04.

Share of operators' investment expenditure in operators' total expenditure (doctors, first-aid medical services) on health care in LAU (I09) describes the intensity of investment made. The change of the values basically depends on investment expenditure to doctors, first-aid medical services (F02) and total operators' expenditure (F01). Here the question is if it is particularly related to changes of: A01, F09, F11, F13, CV01.

Share of operators' investment expenditure in operators' total expenditure (hosiptals) on health care in LAU (I10) describes the intensity of investment made. The change of the values basically depends on investment expenditure to hospitals services (F06) and total operators' expenditure (F05). Here the question is if it is particularly related to changes of: A01, F10. F12, F14, CV02.

Share of all subsidies granted to operators on health care (doctors, first-aid medical services) in total operators' expenditure (I11) describes the level of public aid intensity in doctors/first-aid services. The ratio basically depends on subsidies granted to operators (F11, F13) and their total expenditure (F01). Here the question is if it is particularly related to changes of: A01, A03, A04, F09, CV01.

Share of all subsidies granted to operators on health care (hospitals services) in total operators' expenditure (I12) describes the level of public aid intensity in hospitals services. The ratio basically depends on subsidies granted to operators (F12, F14) and their total expenditure (F02). Here the question is if it is particularly related to changes of: A01, A03, A04, F10. CV02.

Number of citizens per doctor in first-aid medical services (I13) describes the average availability of service. The change of the values basically depends on number of staff in doctors/first-aid medical services (CV03) and number of citizens (A01). Here the question is if it is particularly related to changes of: A03, F01, CV01.

Number of citizens per bed in hospitals (I14) describes the average availability of service. The change of the values basically depends on number of beds in hospitals (CV04) and number of citizens (A01). Here the question is if it is particularly related to changes of: A03, F05, CV02.

Study field: housing

A	**BASIC DATA**
A01	Population (thousands)
A02	Area (sq km)
A03	Budget income per capita (EUR/person)
A04	Budget debt ratio (%)
F	**FINANCE**
F01	Expenditure on public housing (thousand national currency)
F02	Expenditure on social public housing (thousand national currency)
F03	Expenditure on non-social public housing (thousand national currency)
F04	Revenues on public housing (thousand national currency)
F05	Revenues on social public housing (thousand national currency)
F06	Revenues on non-social public housing (thousand national currency)
F07	Operational costs on public housing (thousand national currency)
F08	Operational costs on social public housing (thousand national currency)
F09	Operational costs on non-social public housing (thousand national currency)
F10	Repair and maintenance cost in public housing (thousand national currency)
CV	**CUSTOMERS AND VOLUME**
CV01	Number of people living in public housing (person)
CV02	Number of people living in social public housing
CV03	Number of people living in non-social public housing
CV04	Total square meters of public housing (thousand sq m)
CV05	Total square meters of social public housing (thousand sq m)
CV06	Total square meters of non-social public housing (thousand sq m)
CV07	Vacancy rate in public housing (%)
CV08	Vacancy rate in social public housing (%)
CV09	Vacancy rate in non-social public housing (%)
CV10	Individual building permits per 10000 inhabitants
I	**COST INDICATORS OF SERVICES AND INFRASTRUCTURE**
I01	Return on public housing [(F04-F01)/F04]
I02	Return on social public housing [F(05-F02)/F05]
I03	Return on non-social public housing [(F06-F03)/F06]
I04	Operational costs on public housing (thousand national currency) per square meters [F07/CV04]
I05	Operational costs on social public housing (thousand national currency) per square meters [F08/CV05]
I06	Operational costs on non-social public housing (thousand national currency) per square meters [F09/CV06]
I07	Share of people living in public housing to general population per 1000 inhabitants [CV01/A01]
I08	Share of people living in social public housing to general population per 1000 inhabitants [CV02/A01]
I09	Share of people living in non-social public housing to general population per 1000 inhabitants [CV03/A01]

Return on public housing (I01) describes the level of profitability or deficit in financing of social and non-social public housing. The change of the values basically depends on costs (F01) / revenues (F04). Here the question is if it is particularly related to changes of: A01, CV01, CV04, CV07.

Return on social public housing (I02) describes the level of profitability or deficit in financing social public housing. The change of the values basically depends mostly on costs (F02) and to some extent on revenues (F05). Here the question is if it is particularly related to changes of: A01, CV02, CV05, CV08.

Return on non-social public housing (I03) describes the level of profitability or deficit in financing all public housing except for social public housing. The change of the values basically depends on costs (F03)/revenues (F06). Here the question is if it is particularly related to changes of: A01, CV03, CV06, CV09, CV10. The value shows proficiency in public housing management and its resilience to shrinkage.

Operational costs on public housing (thousand national currency) per square meters (I04) describe average cost of public housing services (without cost of repair and maintenance, investment and finance). The change of the values basically depends on costs of operations regarding public housing services (F07) and volume of public housing infrastructure (CV04). Here the question is if it is particularly related to changes of: A01, F04, F10. CV01, CV07.

Operational costs on social public housing (thousand national currency) per square meters (I05) describe average cost of social public housing services (without cost of repair and maintenance, investment and finance). The change of the values basically depends on costs of operations regarding social public housing services (F08) and volume of social public housing infrastructure (CV05). Here the question is if it is particularly related to changes of: A01, F05, F10. CV02, CV08.

Operational costs on non-social public housing (thousand national currency) per square meters (I06) describe average cost of non-social public housing services (without cost of repair and maintenance, investment and finance). The change of the values basically depends on costs of operations regarding non-social public housing services (F09) and volume of non-social public housing infrastructure (CV06). Here the question is if it is particularly related to changes of: A01, F06, F10. CV03, CV09.

Share of people living in public housing to general population per 1000 inhabitants (I07) describes level of engagement in public housing service and infrastructure provision. The change of the values basically depends on volume of customers of public housing (CV01) and population in given territorial unit (A01). Here the question is if it is particularly related to changes of: F01, CV07, CV10.

Share of people living in social public housing to general population per 1000 inhabitants (I08) describes level of engagement in social public housing service and infrastructure provision. The change of the values basically depends on supply of social public housing (CV02) and population in given territorial unit (A01). Here the question is if it is particularly related to changes of: F02, CV08, CV10.

Share of people living in non-social public housing to general population per 1000 inhabitants (I09) describes level of engagement in non-social public housing service and infrastructure provision. The change of the values basically depends on customers of public housing (CV03) and population in given territorial unit (A01). Here the question is if it is particularly related to changes of: F03, CV09, CV10.

Network infrastructure: cost analysis – ratios and investigation paths

Study field: roads

A	**BASIC DATA**
A01	Population (thousands)
A02	Area (sq km)
A03	Budget income per capita (EUR/person)
A04	Budget debt ratio (%)
F	**FINANCE**
F01	Total expenditure on LAU-managed roads (thousand national currency)
F02	Total investment expenditure on LAU-managed roads (thousand national currency)
F03	Total maintenance expenditure on LAU-managed roads (thousand national currency)
F04	Total expenditure on street lightning on LAU-managed roads (thousand national currency)
F05	Total expenditure on non-LAU-managed roads (thousand national currency)
F06	Total investment expenditure on non-LAU-managed roads (thousand national currency)
F07	Total maintenance expenditure on non-LAU-managed roads (thousand national currency)
F08	Total expenditure on street lightning on non-LAU-managed roads (thousand national currency)
F09	Income on LAU-managed roads - redistribution, subsidies, fees, tolls (thousand national currency)
F10	Income on non-LAU-managed roads - redistribution, subsidies, fees, tolls (thousand national currency)
CV	**CUSTOMERS AND VOLUME**
CV01	Length of LAU-managed road network
CV02	Length of non-LAU-managed road network
CV03	Number of cars registered in LAU (units)
CV04	Length of bicycle roads
CV05	Length of LAU-managed roads equipped with street lightning
CV06	Length of non-LAU-managed roads equipped with street lightning
I	**COST INDICATORS OF SERVICES AND INFRASTRUCTURE**
I01	Share of income on LAU-managed roads in total expenditure on LAU-managed roads [F09/F01]
I02	Share of income on non-LAU-managed roads in total expenditure on non-LAU-managed roads [F10/F05]
I03	Average cost of public roads per km [(F01+F04+F05+F08)/(CV01+CV02)]
I04	Average cost of public roads per car [(F01+F04+F05+F08)/CV03]
I05	Share of repair and maintenance costs in total expenditure on LAU-managed roads [F03/F01]
I06	Share of repair and maintenance costs in total expenditure on roads [(F03+F07)/(F01+F05)]
I07	Average cost of street lightning per km of roads [(F04+F08)/(CV05+CV06)]

Share of income on LAU-managed roads in total expenditure on LAU-managed roads (I01) describes the intensity of external financing of LAU-managed road network. The change of the values basically depends on income on LAU-managed roads (F09) and total expenditure (F01). Here the question is if it is particularly related to changes of: A01, CV01, CV05.

Share of income on non-LAU-managed roads in total expenditure on non-LAU-managed roads (I02) describes the intensity of external financing of non-LAU-managed road network. The change of the values basically depends on income on non-LAU-managed roads (F10) and total expenditure on non-LAU-managed roads (F05). Here the question is if it is particularly related to changes of: A01, CV02, CV06.

Average cost of public roads per km (I03) describes the average cost of LAU and non-LAU managed road network per km. The change of the values basically depends on all types of costs (F01, F04, F05, F08) / total length of roads in LAU (CV01,CV02). Here the question is if it is particularly related to changes of: A01, CV05, CV06.

Average cost of public roads per car (I04) describes the average cost of LAU and non-LAU managed road network per car. The change of the values basically depends on all types of costs (F01, F04, F05, F08) / total number of cars registered in LAU (CV03). Here the question is if it is particularly related to changes of: A01, CV04.

Share of repair and maintenance costs in total expenditure on LAU-managed roads (I05) describes the level of technical usage of LAU-managed road network. The change of the values basically depends on repair and maintenance costs on LAU-managed road network (F03) and total expenditure on LAU-managed roads (F01). Here the question is if it is particularly related to changes of: A01, CV01, CV03, CV05.

Share of repair and maintenance costs in total expenditure on roads (I06) describes the level of technical usage of LAU and non-LAU-managed road network. The change of the values basically depends on repair and maintenance costs on LAU and non-LAU-managed road network (F03, F07) and total expenditure on LAU and non-LAU-managed roads (F01, F05). Here the question is if it is particularly related to changes of: A01, CV01, CV02, CV03, CV05, CV06.

Average cost of street lightning per km of roads (I07) describes the level of lightning effectiveness. The change of the values basically depends on expenditure on street lightning (F04, F08) and length of LAU and non-LAU-managed roads equipped with street lights (CV05, CV06). Here the question is if it is particularly related to changes of: A01, CV01, CV02.

Study field: public transport

A	**BASIC DATA**
A01	Population (thousands)
A02	Area (sq km)
A03	Budget income per capita (EUR/person)
A04	Budget debt ratio (%)
F	**FINANCE**
F01	Total operators' expenditure on public transport - buses, trams (thousand national currency)
F02	Total operators' revenues on public transport - buses, trams (thousand national currency)
F03	Operators' revenues on core service sold - revenue on tickets in buses, trams (thousand national currency)
F04	Operators' investment expenditure on public transport - buses, trams (thousand national currency)
F05	Operators' operational expenditure on public transport - buses, trams (thousand national currency)
F06	Operators' repair and maintenance expenditure in public transport - buses, trams (thousand national currency)
F07	Subsidies of LAU local government to public transport system - buses, trams (thousand national currency)
CV	**CUSTOMERS AND VOLUME**
CV01	Number of passengers in buses, trams per year (person)
CV02	Distance travelled by means of transportation - buses, trams (km)
CV03	Length of public transport - buses, trams - lines (km)
CV04	Number of buses and trams (units)
CV05	Capacity of means of public transportation - buses, trams (person)
CV06	Average age of means of public transportation - buses, trams (years)
CV07	Number of newly registered cars
I	**COST INDICATORS OF SERVICES AND INFRASTRUCTURE**
I01	Return on public transport [(F02-F01)/F02]
I02	Return on service sold [(F03-F01)/F03]
I03	Cost of public transportation per km [F01/CV02]
I04	Share of investment costs in total expenditure [F04/F01]
I05	Share of operational costs in total expenditure [F05/F/01]
I06	Share of repair and maintenance costs in total expenditure [F06/F/01]
I07	Share of subsidies in total revenues [F07/F02]
I08	Intensity of public transport lines use [CV02/CV03]
I09	Share of people registering new cars to general population per 1000 inhabitants [CV07/A01]

Return on public transport (I01) describes the level of profitability or deficit in financing of public transport. The change of the values basically depends on costs (F01) / revenues (F02). Here the question is if it is particularly related to changes of: A01, CV01, CV02, CV03, CV04, CV05, CV06.

Return on service sold (I02) describes the level of profitability or deficit in financing core operations of public transport. The change of the values basically depends on costs (F01) / core service revenues (F03). Here the question is if it is particularly related to changes of: A01, CV01, CV02, CV03, CV04, CV05, CV07.

Cost of public transportation per km (I03) describes the operators' average cost of public transportation per km. The change of the values basically depends on costs (F01) / distance (CV02). Here the question is if it is particularly related to changes of: A01, CV03, CV04. The value shows proficiency in public housing management and its resilience to shrinkage.

Share of investment costs in total expenditure (I04) describes the intensity of investment made to public transportation. The change of the values basically depends on investment expenditure on public transport (F04) and total operators' expenditure (F01). Here the question is if it is particularly related to changes of: A01, CV04, CV05, CV06.

Share of operational costs in total expenditure (I05) describes the level of variable costs in overall spending on public transportation. The change of the values basically depends on operational costs on public transport (F05) and total operators' expenditure (F01). Here the question is if it is particularly related to changes of: A01, CV02, CV03, CV04.

Share of repair and maintenance costs in total expenditure (I06) describes the level of technical usage of public transportation infrastructure. The change of the values basically depends on repair and maintenance costs on public transport (F06) and total operators' expenditure (F01). Here the question is if it is particularly related to changes of: A01, CV02, CV06.

Share of subsidies in total revenues (I07) describes public intervention intensity towards public transportation. The change of the values basically depends on the level of subsidies to public transport (F07) and total operators' revenues (F02). Here the question is if it is particularly related to changes of: A01, A03, A04, CV01, CV02.

Intensity of public transport lines use (I08) describes spatial compactness of service delivery. The change of the values basically depends on distance travelled by buses and trams (CV02) and length of lines (CV03). Here the question is if it is particularly related to changes of: A01, CV01, CV05, CV07.

Share of people registering new cars to general population per 1000 inhabitants (I09) describes level of alternative transportation schemes to public transportation. The change of the values basically depends on new cars registered (CV07) and population in given territorial unit (A01). Here the question is if it is particularly related to changes of: F01, CV03, CV04.

Study field: water and sewage

Code	Data
A	BASIC DATA
A01	Population (thousands)
A02	Area (sq km)
A03	Budget income per capita (EUR/person)
A04	Budget debt ratio (%)
F	**FINANCE**
F01	Total operators' expenditure on water provision (thousand national currency)
F02	Total operators' revenues on water provision (thousand national currency)
F03	Operators' revenues on water from households (core service sold - revenue on invoices) (thousand national currency)
F04	Operators' revenues on water from companies (core service sold - revenue on invoices) (thousand national currency)
F05	Operators' investments expenditure on water provision (thousand national currency)
F06	Operators' operational costs on water provision (thousand national currency)
F07	Operators' repair and maintenance costs on water provision (thousand national currency)
F08	Subsidies of LAU local government to households water provision (thousand national currency)
F09	Total operators' expenditure on sewerage (thousand national currency)
F10	Total operators' revenues on sewerage (thousand national currency)
F11	Operators' revenues on sewerage from households (core service sold - revenue on invoices) (thousand national currency)
F12	Operators' revenues on sewerage from companies (core service sold - revenue on invoices) (thousand national currency)
F13	Operators' investment expenditure on sewerage (thousand national currency)
F14	Operators' operational costs on sewerage (thousand national currency)
F15	Operators' repair and maintenance costs on sewerage (thousand national currency)
F16	Subsidies of LAU local government to households sewerage (thousand national currency)
CV	**CUSTOMERS AND VOLUME**
CV01	Number of households in water network (thousand)
CV02	Number of households in sewerage network (thousand)
CV03	Length of water network (km)
CV04	Length of sewerage network (km)
CV05	Total amount of distributed water to households (thousands m3)
CV06	Total amount of treated sewerage from households (thousands m3)
CV07	Total amount of distributed water to companies (thousands m3)
CV08	Total amount of treated sewerage from companies (thousands m3)
I	**COST INDICATORS OF SERVICES AND INFRASTRUCTURE**
I01	Return on water [(F02-F01)/F02]
I02	Return on sewerage [(F10-F09)/F10]
I03	Cost of water provision per km [F01/CV03]
I04	Cost of water provision per thousand m3 [F01/(CV05+CV07)]
I05	Cost of sewerage treatment per km [F09/CV04]
I06	Cost of sewerage treatment per thousand m3 [F09/CV06+CV08]
I07	Share of operational costs on water in total expenditure on water [F06/F/01]
I08	Share of operational costs on sewerage in total expenditure on sewerage [F14/F/09]
I09	Share of repair and maintenance costs on water in total expenditure on water [F07/F/01]
I10	Share of repair and maintenance costs on sewerage in total expenditure on sewerage [F15/F/09]
I11	Share of subsidies to households on water in sales of water [F08/F03]
I12	Share of subsidies to households on sewerage in sales of sewerage services [F16/F11]
I13	Intensity of water network [CV01/CV03]
I14	Intensity of sewerage network [CV02/CV04]

Return on water (I01) describes the level of profitability or deficit in financing of water provision. The change of the values basically depends on costs (F01) / revenues (F02). Here the question is if it is particularly related to changes of: A01, CV01, CV03, CV05, CV07.

Return on sewerage (I02) describes the level of profitability or deficit in financing of sewerage treatment. The change of the values basically depends on costs (F09) / revenues (F10). Here the question is if it is particularly related to changes of: A01, CV02, CV04, CV06, CV08.

Cost of water provision per km (I03) describes the operators' average cost of water per km of water network. The change of the values basically depends on costs (F01) / length of water network (CV03). Here the question is if it is particularly related to changes of: A01, F05, CV01, CV05.

Cost of water provision per thousand m3 (I04) describes the operators' average cost of water per delivered m3. The change of the values basically depends on costs (F01) / amount of water delivered to households and business (CV05, CV07). Here the question is if it is particularly related to changes of: A01, F05, CV03, CV05.

Cost of sewerage treatment per km (I05) describes the operators' average cost of sewerage per km of sewerage network. The change of the values basically depends on costs (F09) / length of sewerage network (CV04). Here the question is if it is particularly related to changes of: A01, F13, CV06, CV08.

Cost of sewerage treatment per thousand m3 (I06) describes the operators' average cost of sewerage per m3 treated sewerage. The change of the values basically depends on costs (F09) / amount of sewerage (CV06, CV08). Here the question is if it is particularly related to changes of: A01, F13, CV04.

Share of operational costs on water provision in total expenditure on water provision (I07) describes the level of variable costs in overall spending on water provision. The change of the values basically depends on operational costs on water provision (F06) and total operators' expenditure (F01). Here the question is if it is particularly related to changes of: A01, CV01, CV03, CV05, CV07.

Share of operational costs on sewerage treatment in total expenditure on sewerage treatment (I08) describes the level of variable costs in overall spending on sewerage. The change of the values basically depends on operational costs on sewerage treatment (F14) and total operators' expenditure (F09). Here the question is if it is particularly related to changes of: A01, CV02, CV04, CV06, CV08.

Share of repair and maintenance cost on water provision in total expenditure on water provision (I09) describes the level of technical usage of water network. The change of the values basically depends on repair and maintenance costs on water provision (F07) and total operators' expenditure (F01). Here the question is if it is particularly related to changes of: A01, F05, F08, CV01, CV03, CV05, CV07.

Share of repair and maintenance cost on sewerage treatment in total expenditure on sewerage treatment (I10) describes the level of technical usage of sewerage network. The change of the values basically depends on repair and maintenance costs on sewerage treated (F15) and total operators' expenditure (F09). Here the question is if it is particularly related to changes of: A01, F13, F16, CV02, CV04, CV06, CV08.

Share of subsidies to households on water in sales of water (I11) describes public intervention intensity towards water provision. The change of the values basically depends on the level of subsidies to water system (F08) and operators' revenues from sales to households (F03). Here the question is if it is particularly related to changes of: A01, A03, A04, CV01, CV05.

Share of subsidies to households on sewerage in sales of sewerage services (I12) describes public intervention intensity towards water provision. The change of the values basically

depends on the level of subsidies to water system (F16) and operators' revenues from sales to households (F11). Here the question is if it is particularly related to changes of: A01, A03, A04, CV02, CV06.

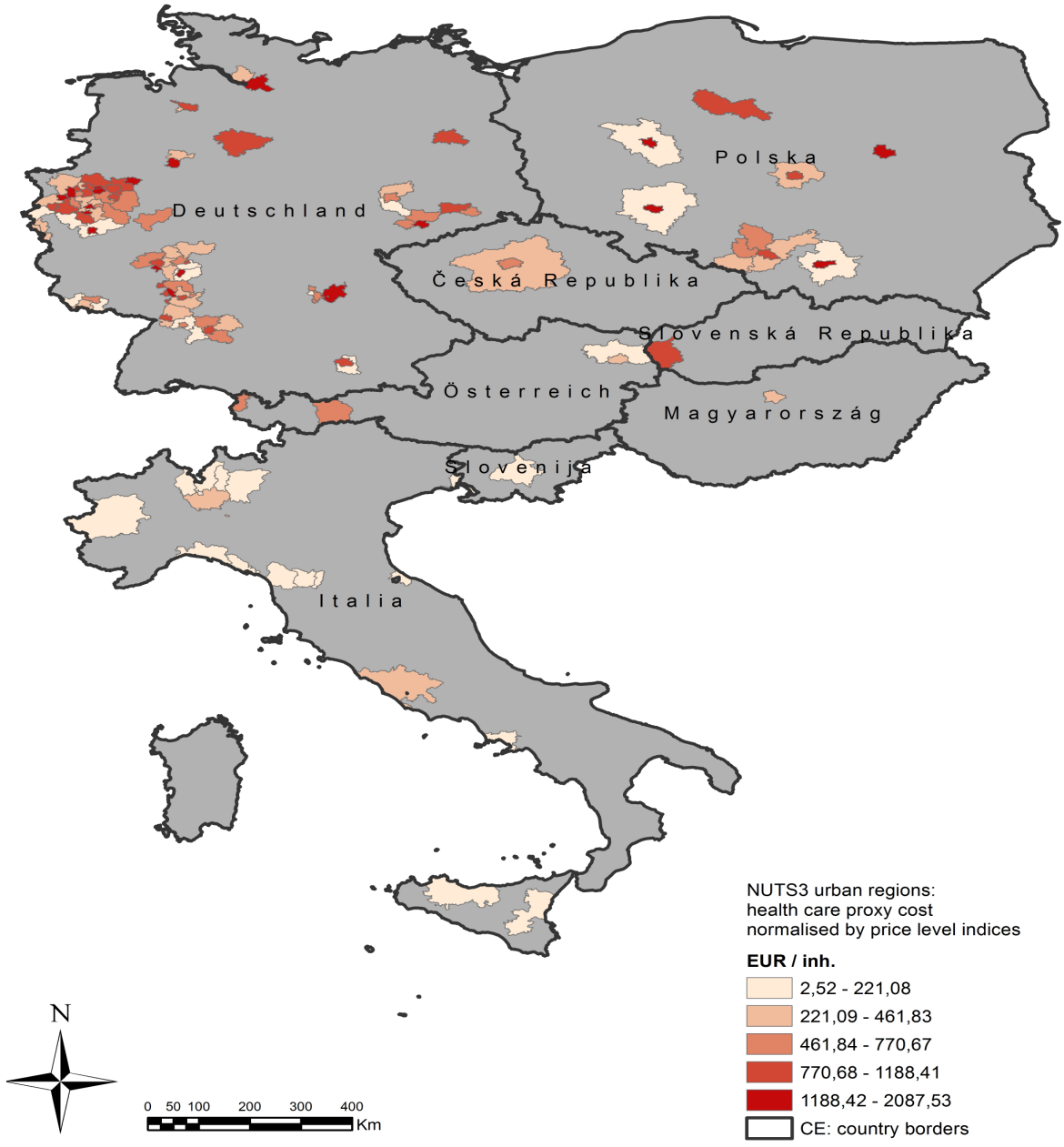
Intensity of water network (I13) describes spatial compactness of service delivery. The change of the values basically depends on number of households using water (CV01) and length of water network (CV03). Here the question is if it is particularly related to changes of: A01, F05, I03.

Intensity of sewerage network (I14) describes spatial compactness of service delivery. The change of the values basically depends on number of households connected to sewerage network (CV02) and length of sewerage network (CV04). Here the question is if it is particularly related to changes of: A01, F13, I04.

For a complete set of methodological guidelines on the field studies see www.adapt2dc.eu

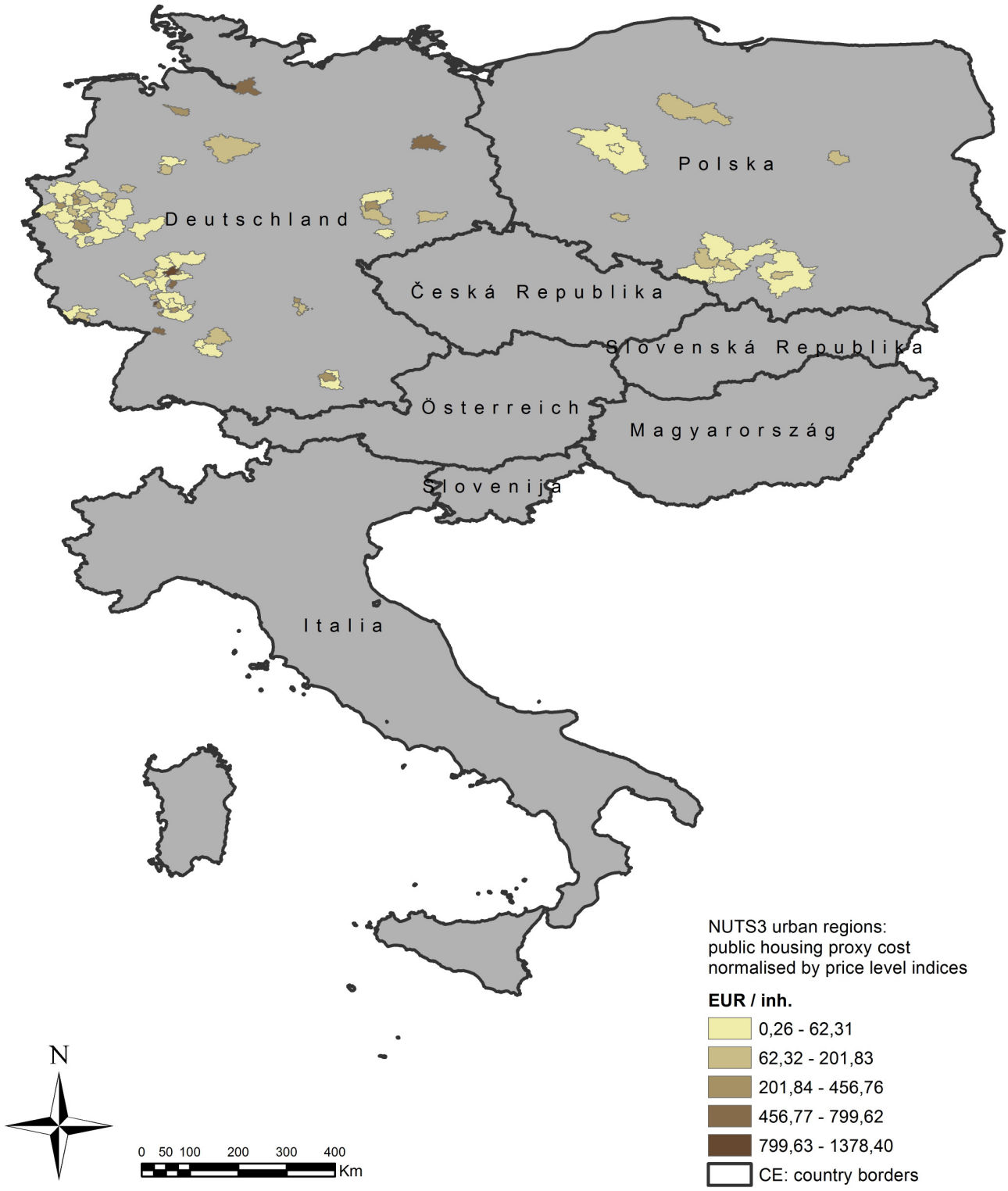
Annex IV. Maps on specific PCR according to the urban/rural typology

Map. X.1. PCR_PLI_HEA levels in Central Europe - predominantly urban regions

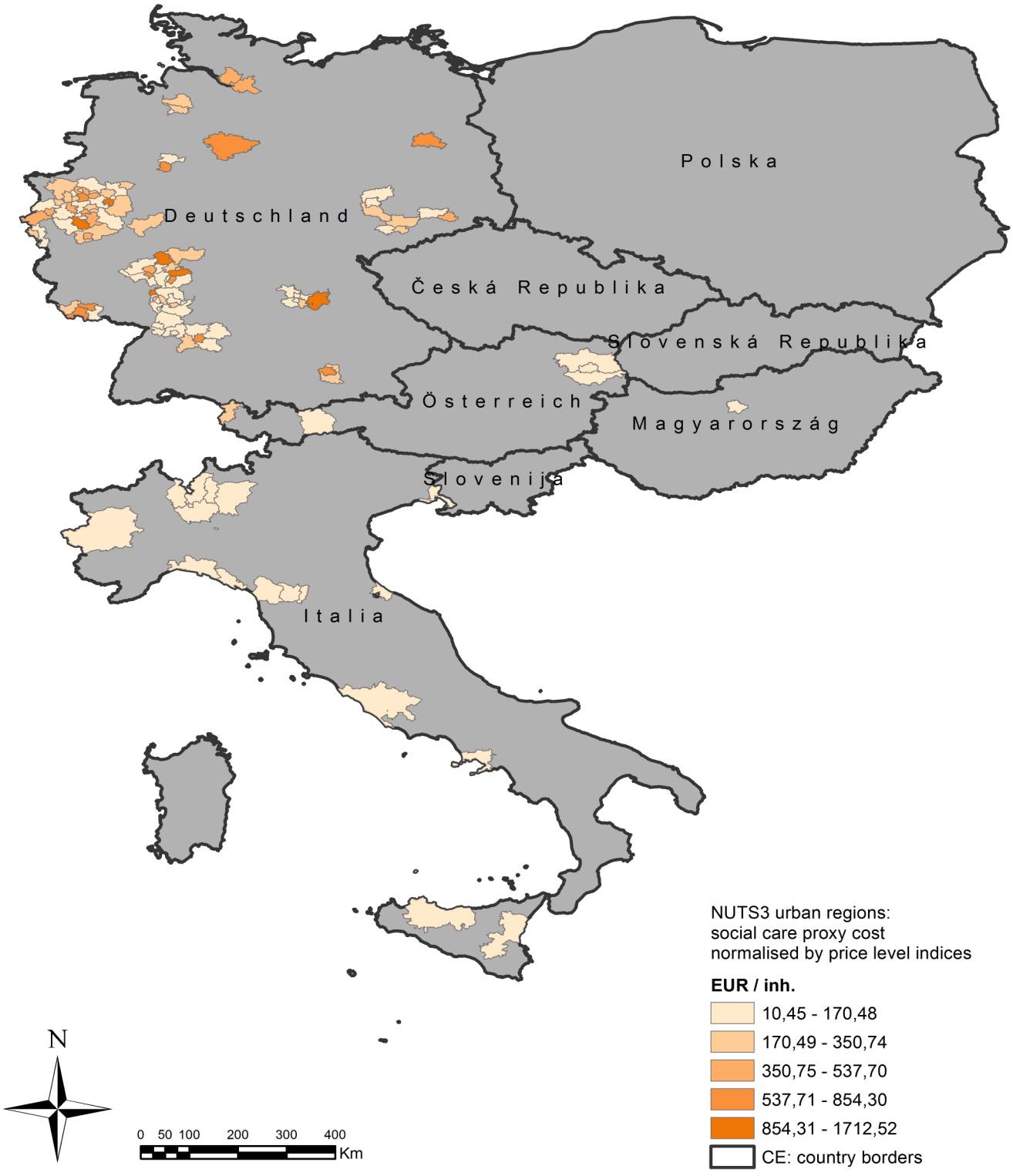


Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

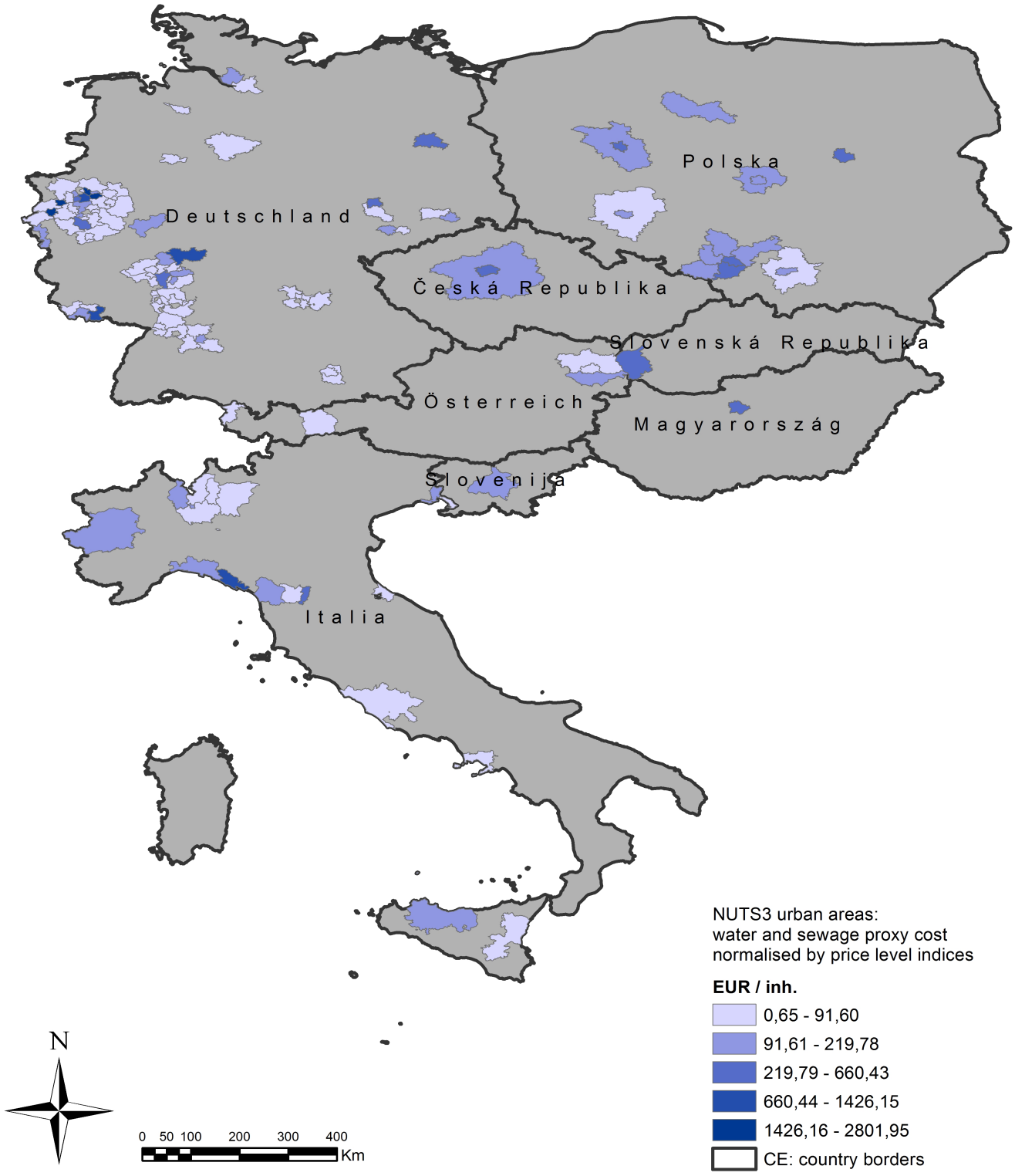
Map. X.2. PCR_PLI_HOU levels in Central Europe - predominantly urban regions



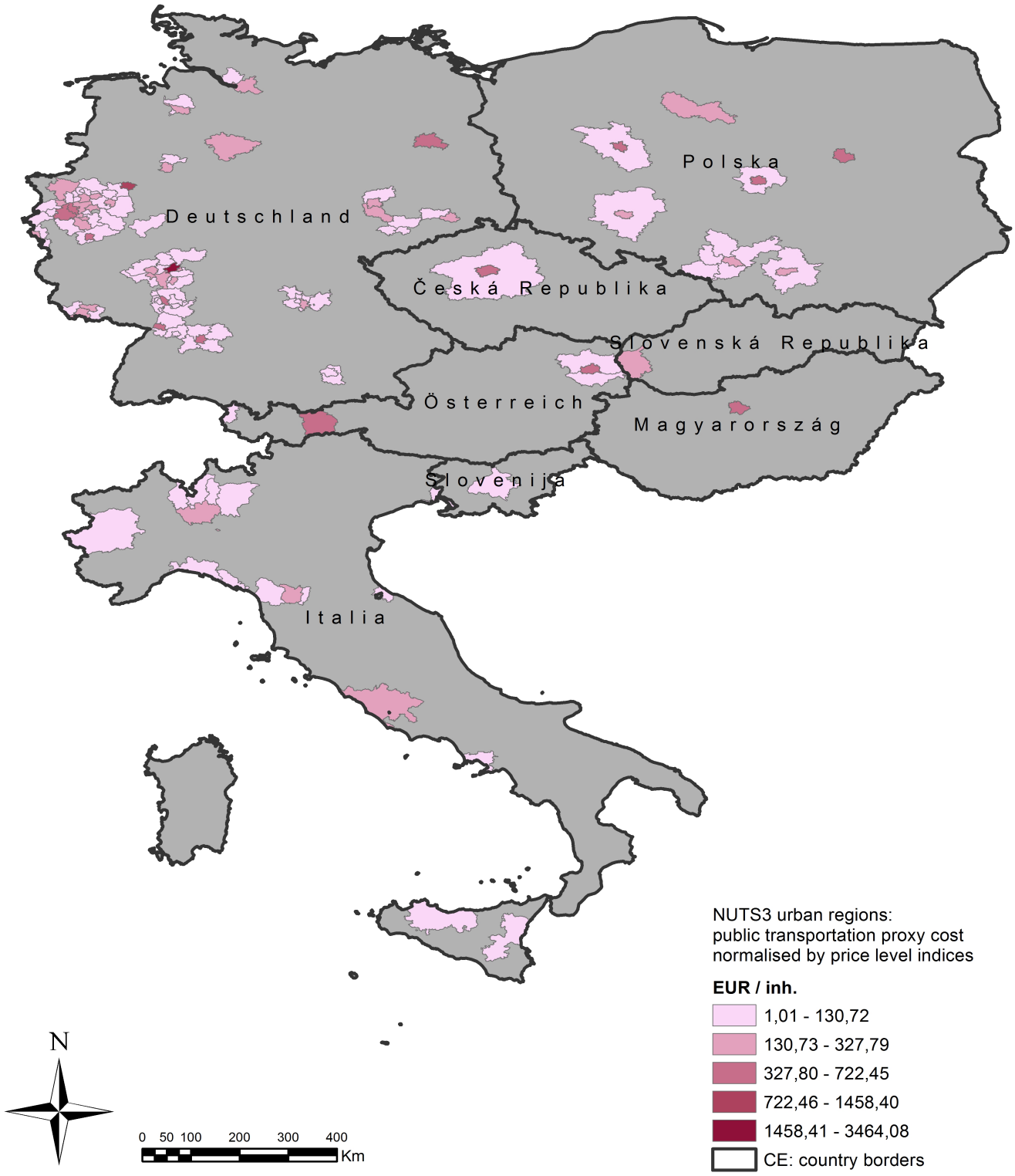
Map. X.3. PCR_PLI_SOC levels in Central Europe - predominantly urban regions


Polska
Deutschland
Česká Republika
Slovenská Republika
Österreich
Magyarország
Slovenija
Italia
N
0 50 100 200 300 400
Km
NUTS3 urban regions:
social care proxy cost
normalised by price level indices
EUR / inh.
10,45 - 170,48
170,49 - 350,74
350,75 - 537,70
537,71 - 854,30
854,31 - 1712,52
CE: country borders

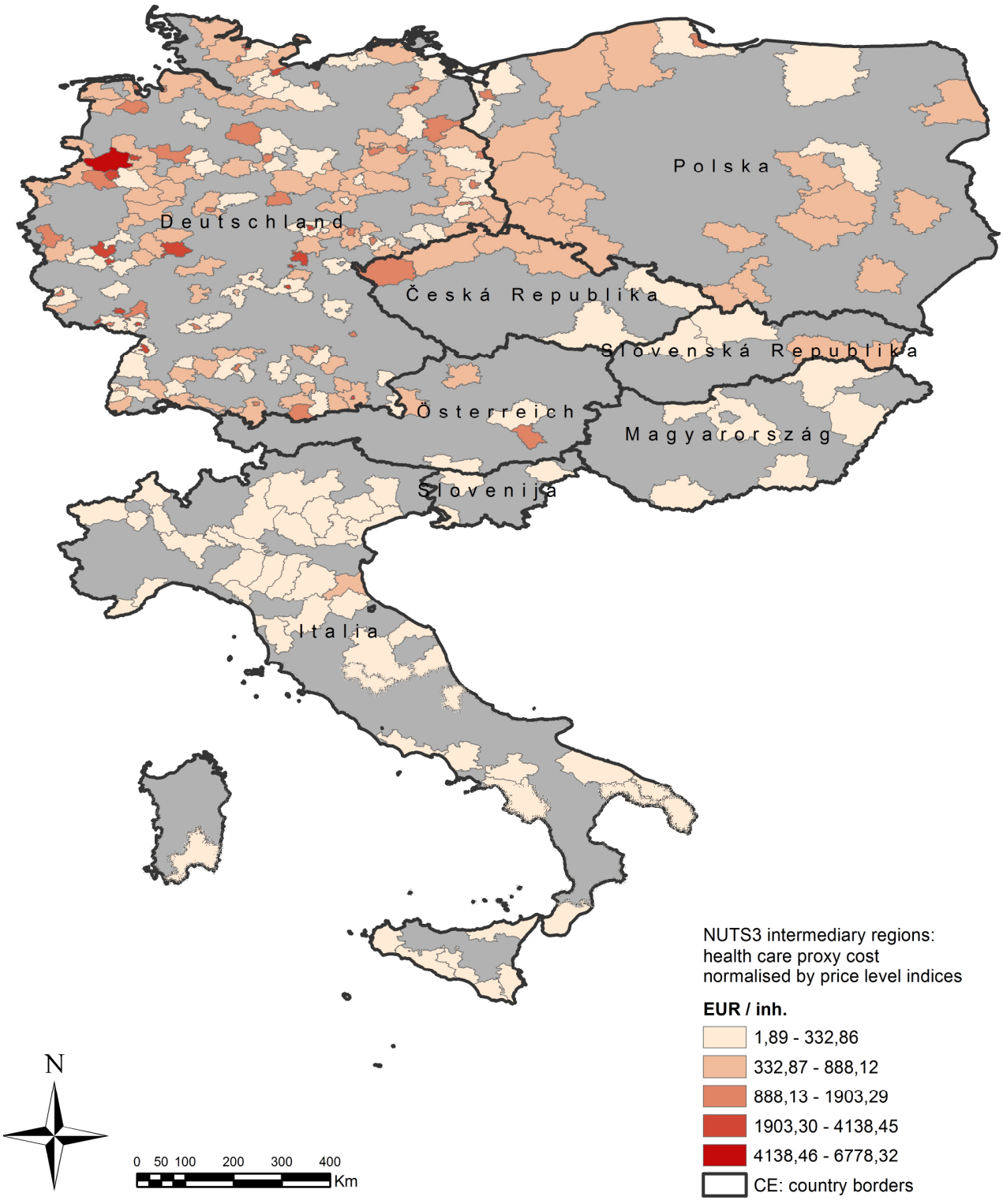
Map. X.4. PCR_PLI_WAT levels in Central Europe - predominantly urban regions



Map. X.5. PCR_PLI_TRA levels in Central Europe - predominantly urban regions

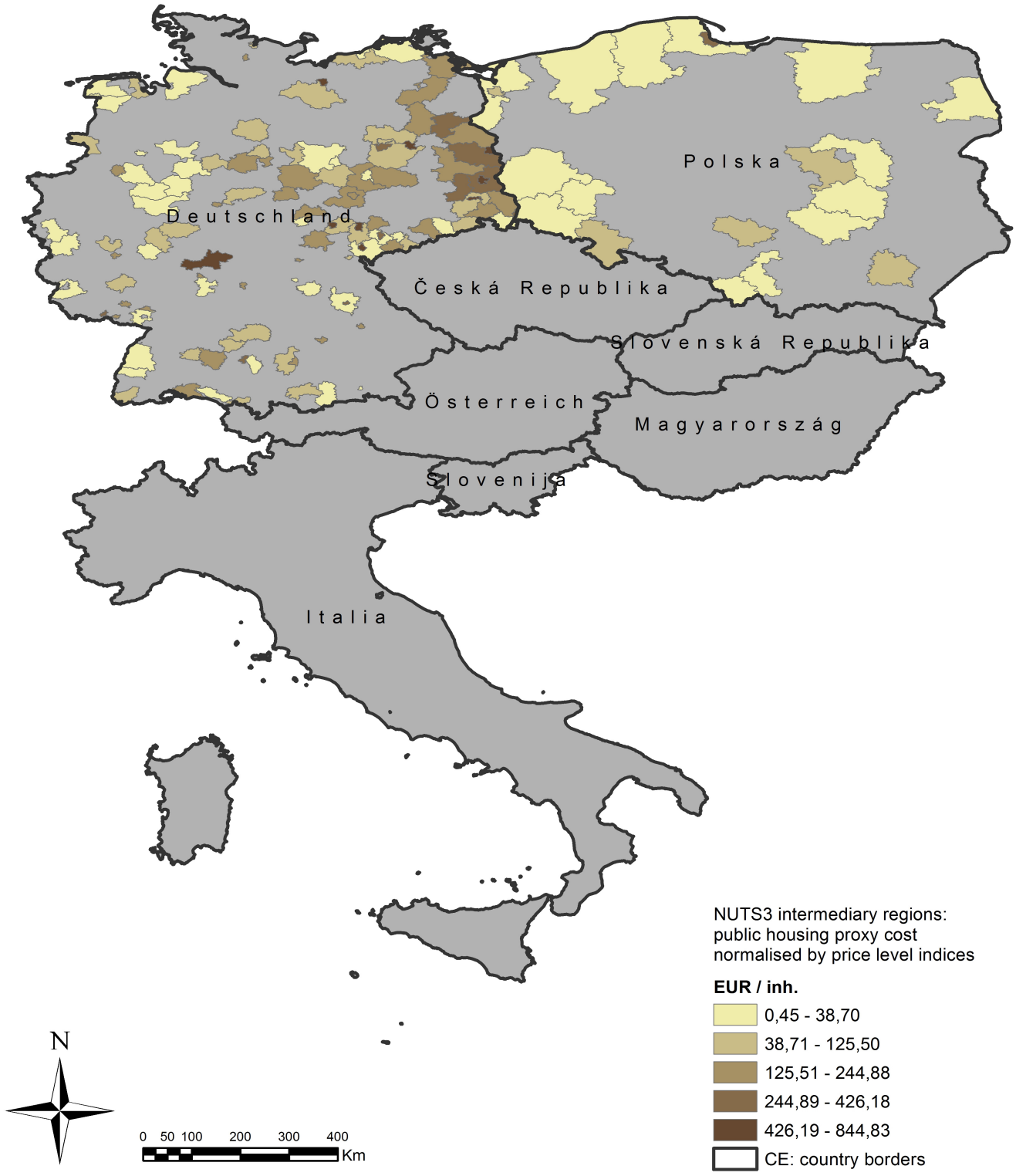


Map. X.6. PCR_PLI_HEA levels in Central Europe - intermediate regions



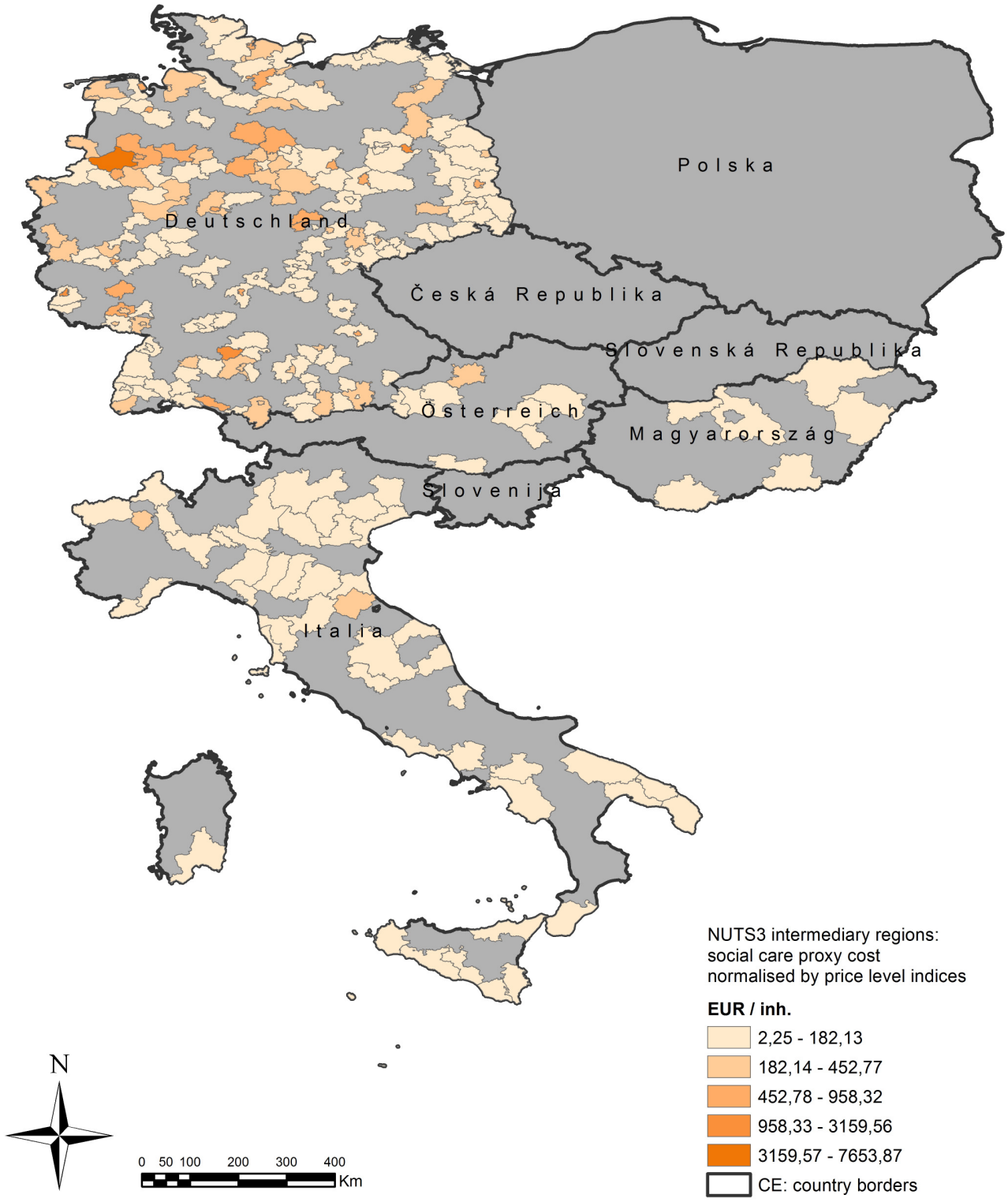
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. X.7. PCR_PLI_HOU levels in Central Europe - intermediate regions



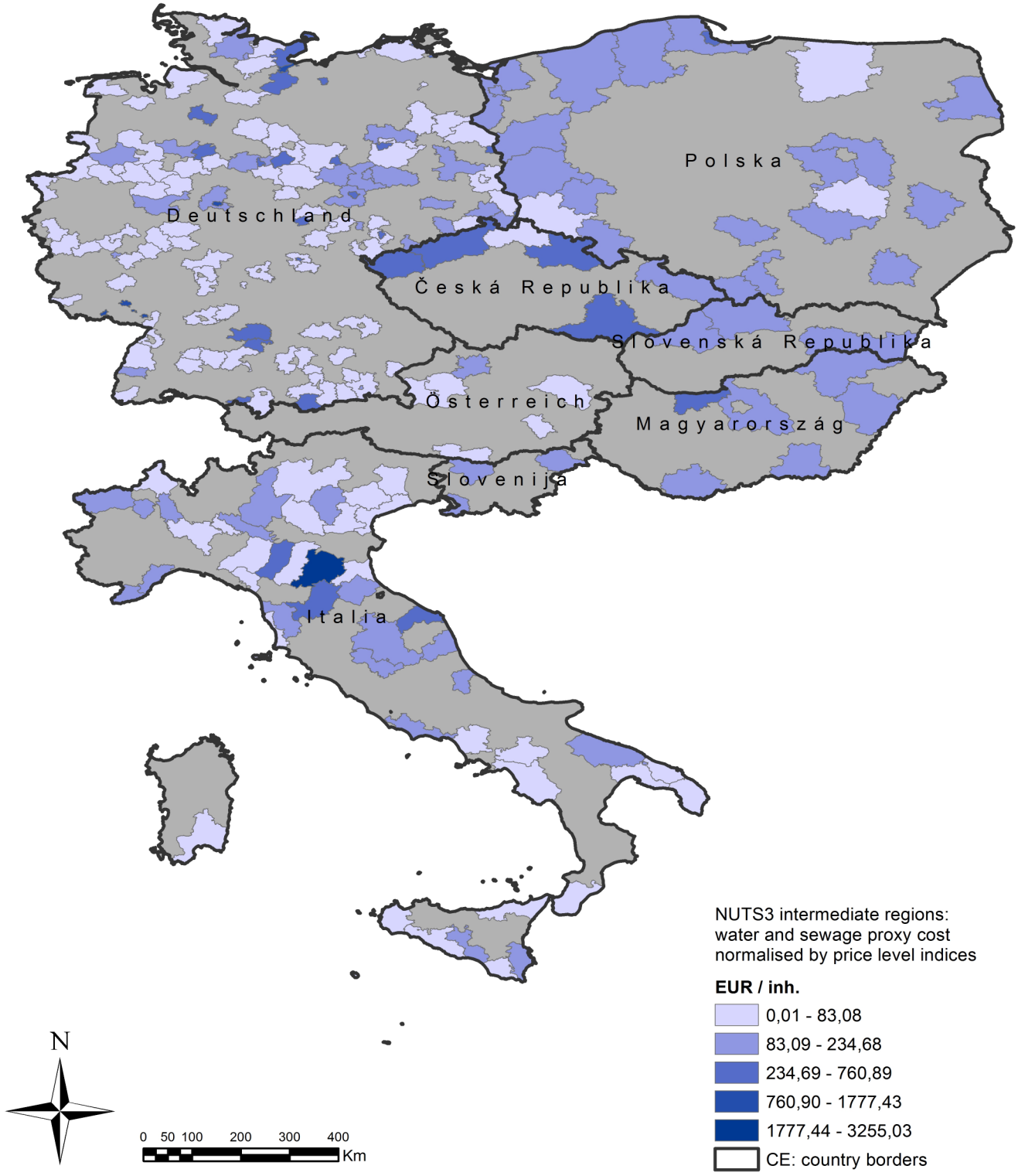
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. X.8. PCR_PLI_SOC levels in Central Europe - intermediate regions



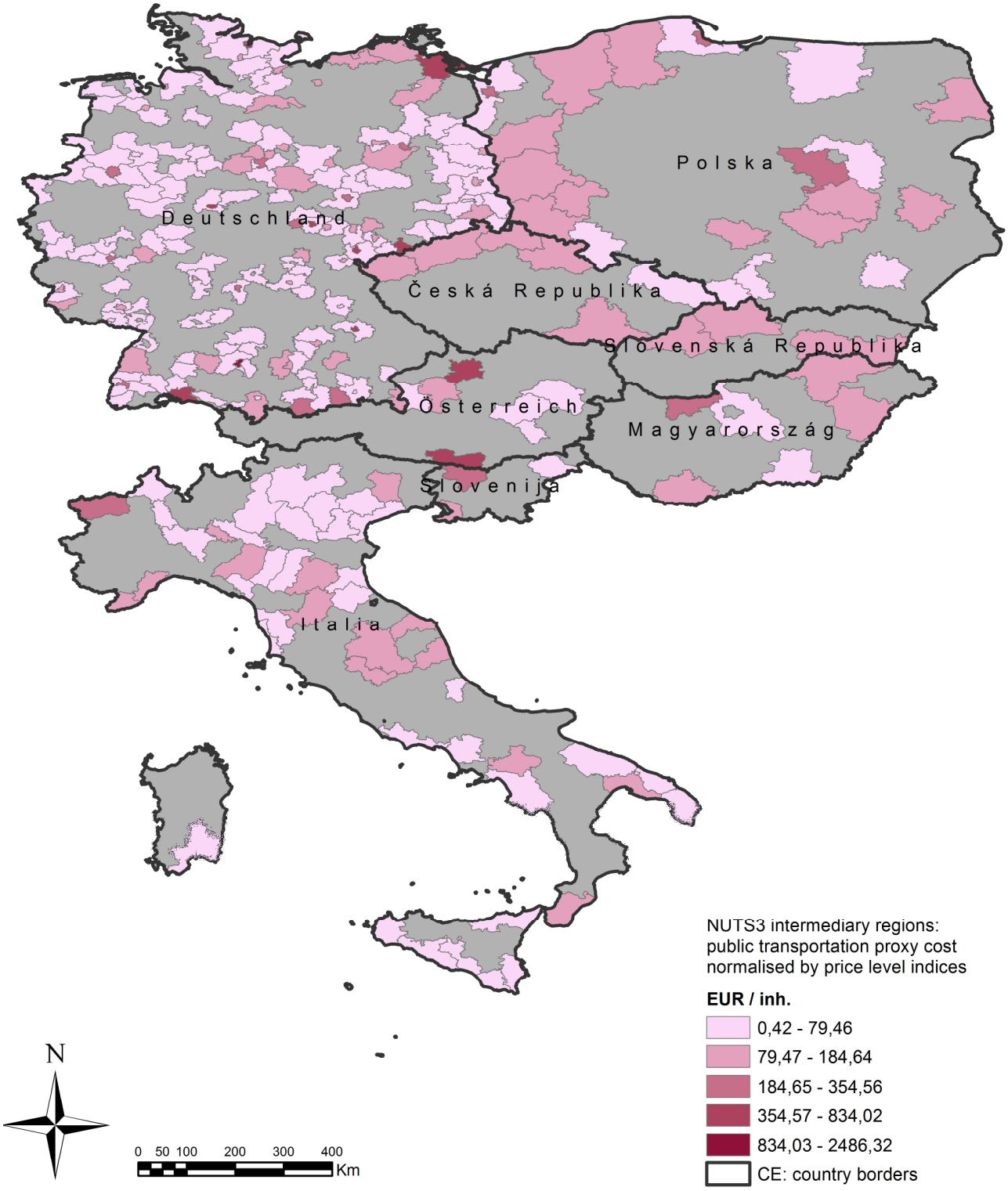
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. X.9. PCR_PLI_WAT levels in Central Europe - intermediate regions

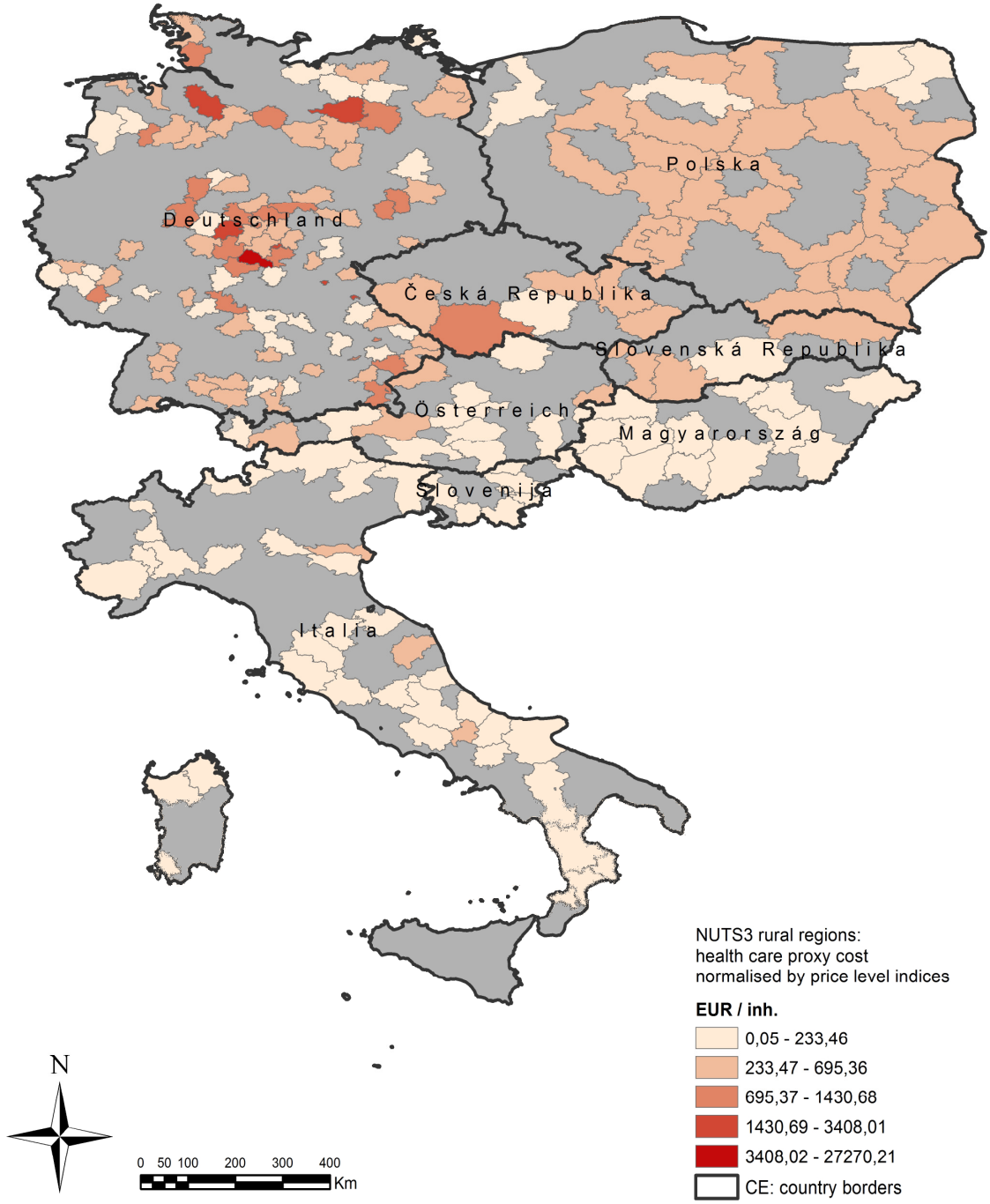


Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

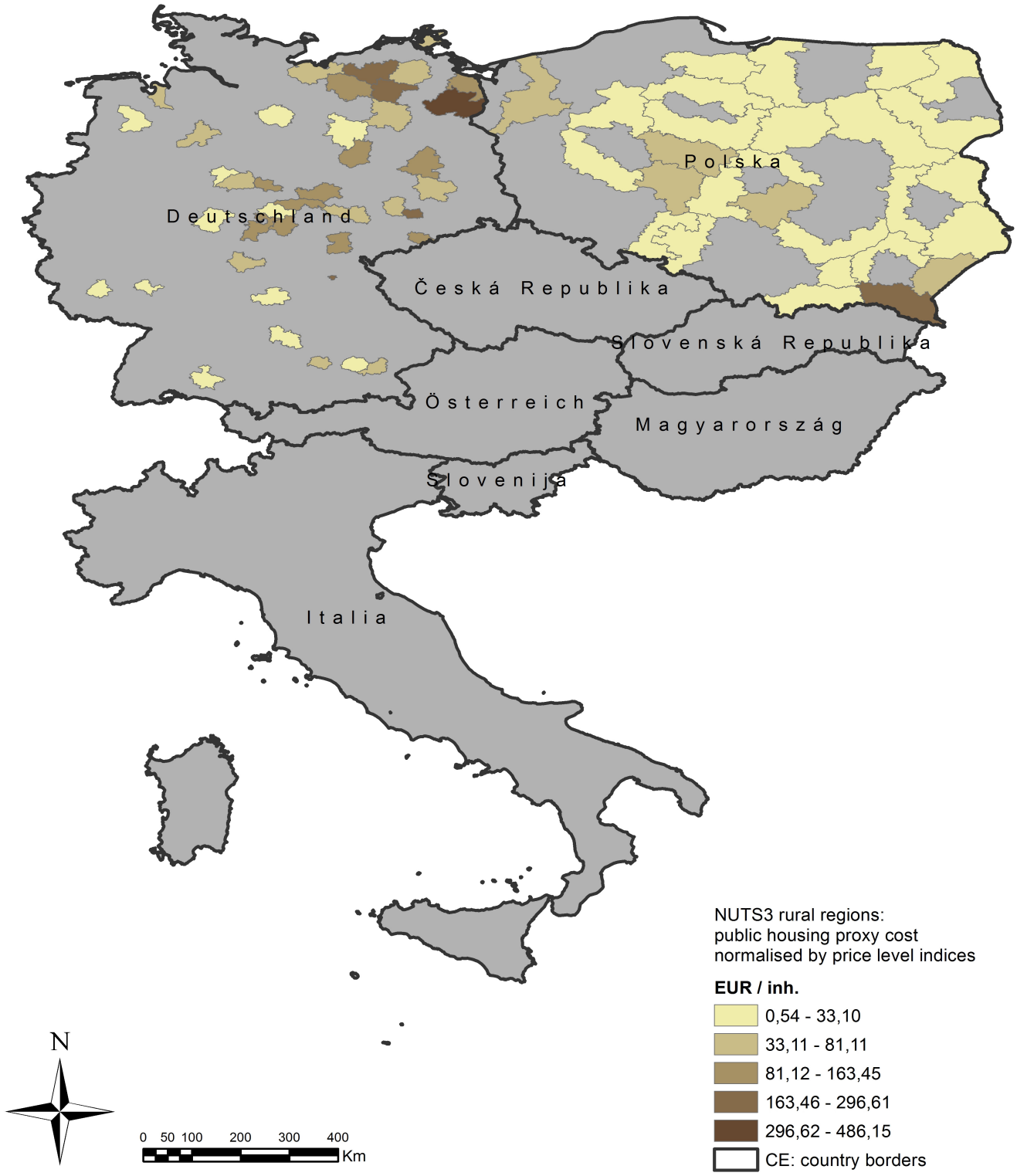
Map. X.10. PCR_PLI_TRA levels in Central Europe - intermediate regions



Map. X.11. PCR_PLI_HEA levels in Central Europe - predominantly rural regions

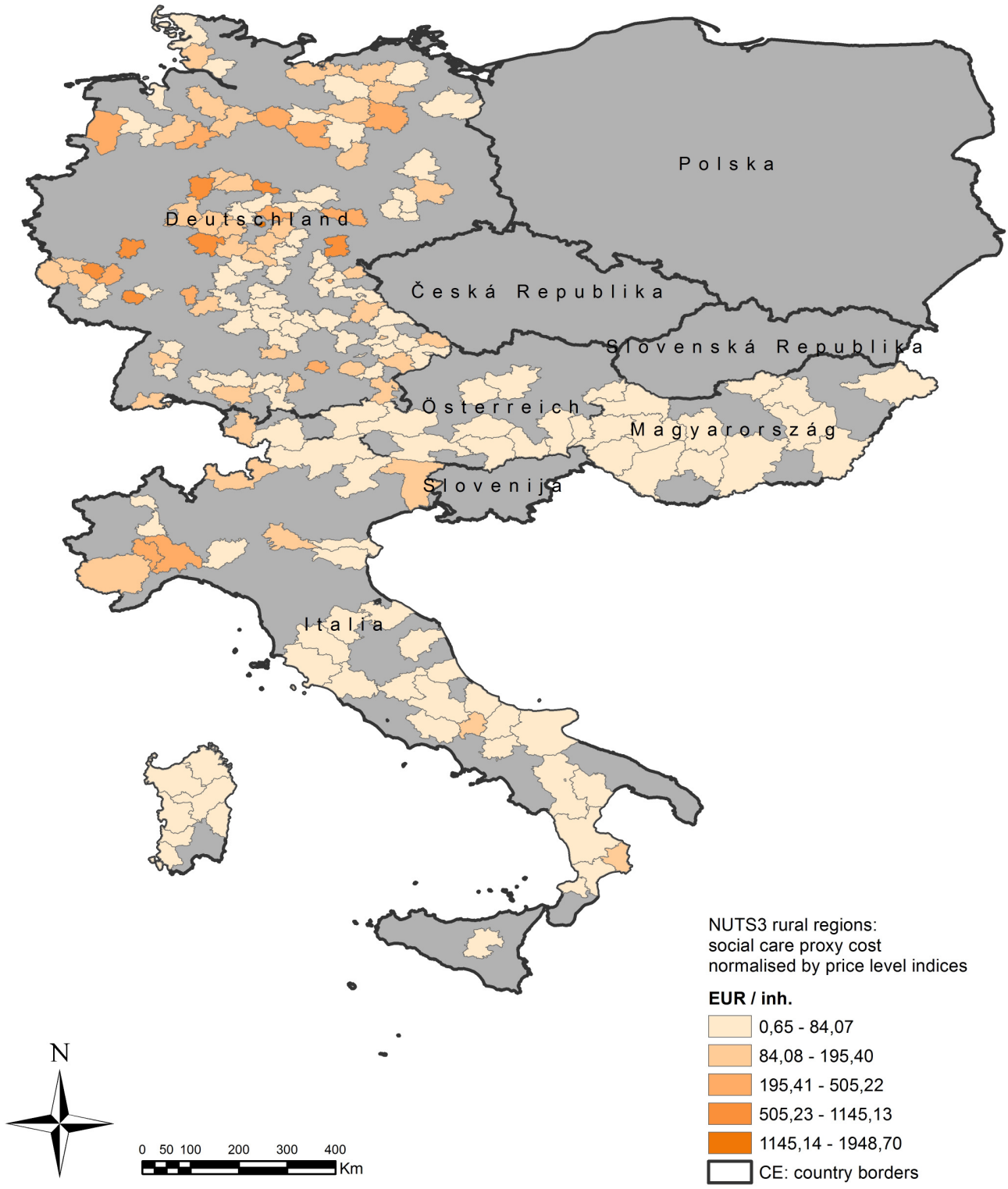


Map. X.12. PCR_PLI_HOU levels in Central Europe - predominantly rural regions



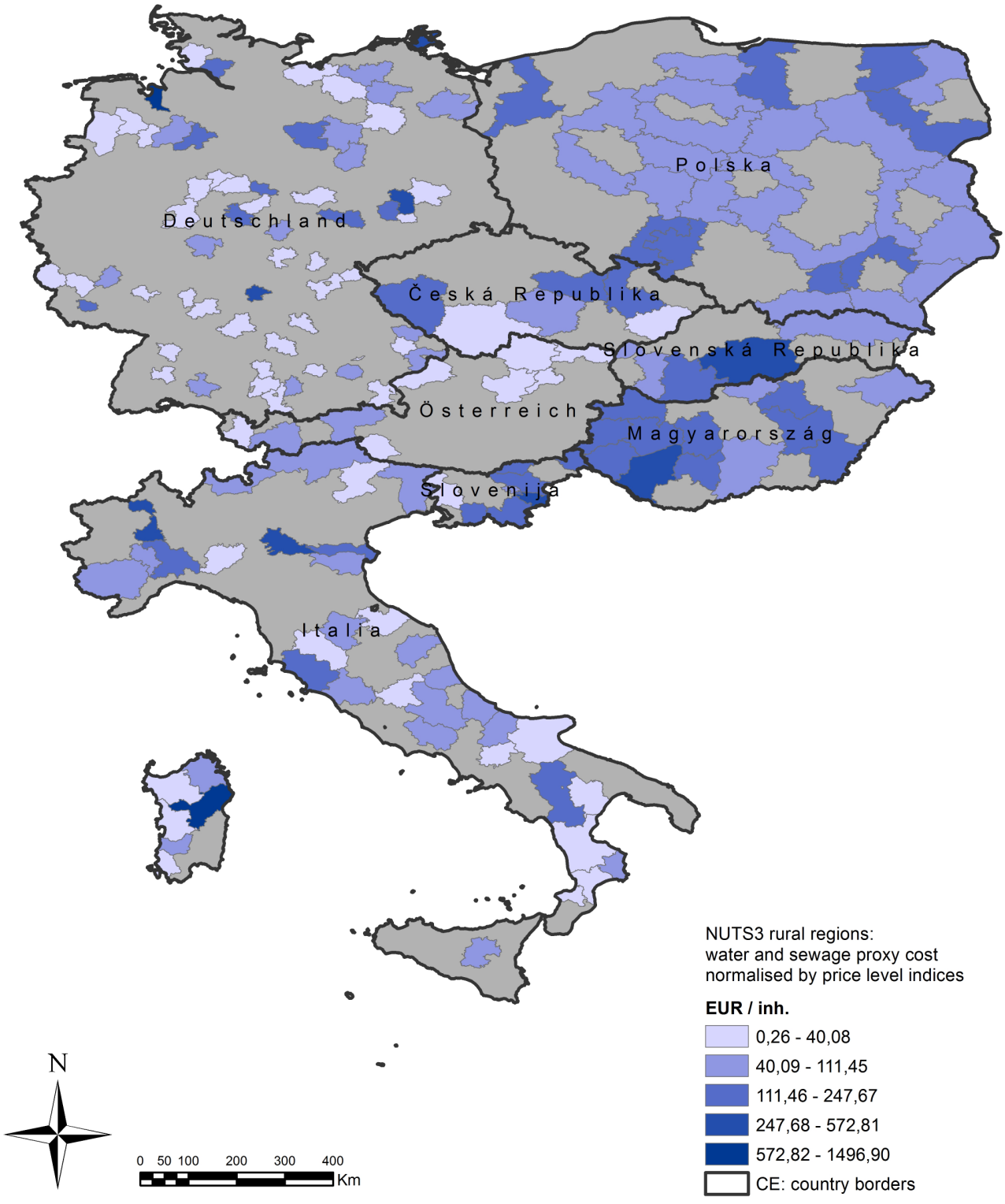
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. X.13. PCR_PLI_SOC levels in Central Europe - predominantly rural regions



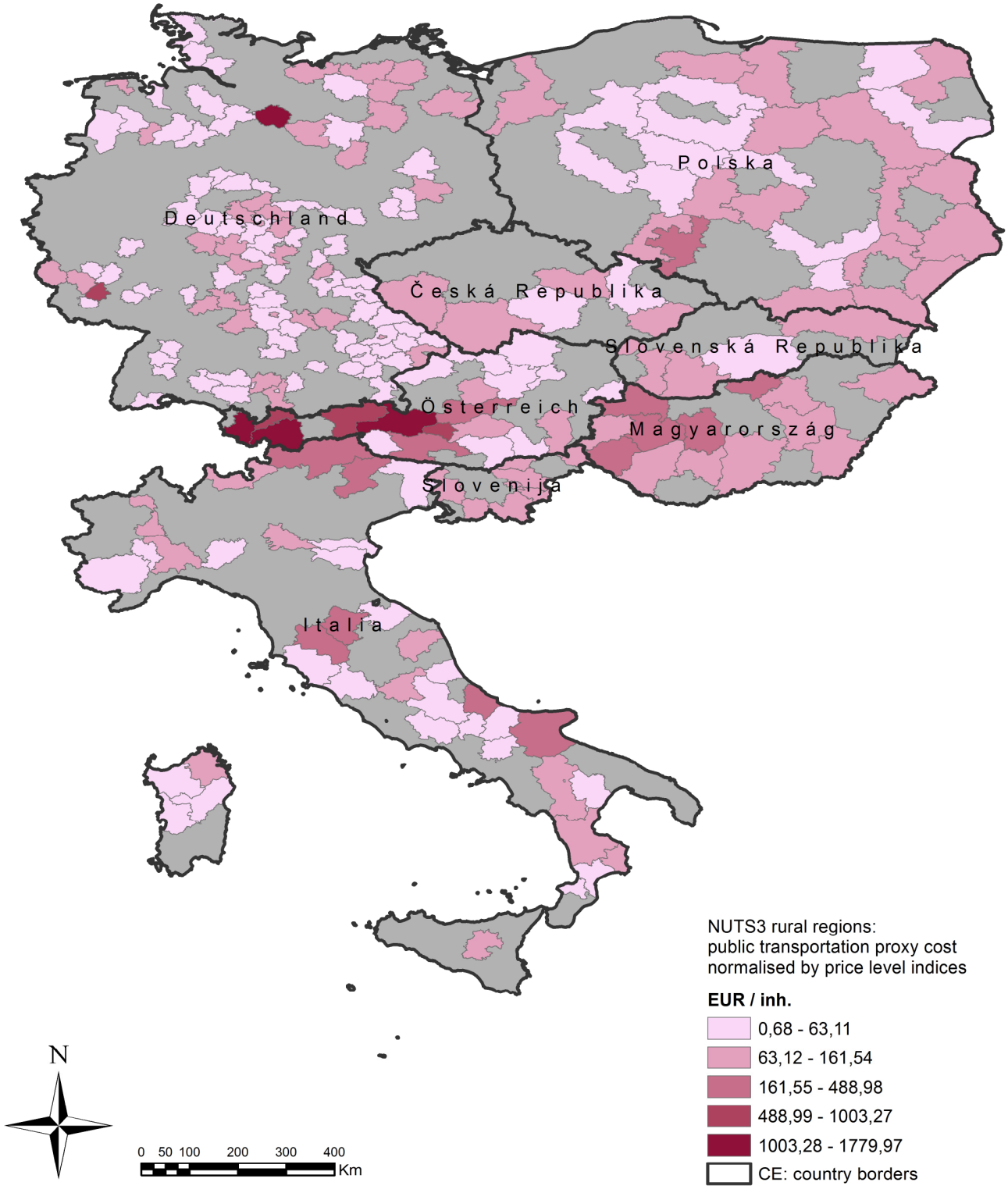
Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. X.14. PCR_PLI_WAT levels in Central Europe - predominantly rural regions



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.

Map. X.15. PCR_PLI_TRA levels in Central Europe - predominantly rural regions



Disclaimer: PCR calculations are based upon the best available data set extracted from Amadeus by Bureau van Dijk. PCRs are not backed up by the complete territorial data. Individual observations concerning particular NUTS3 territories may be over- or underestimated.