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Depopulation Differences in Slovak Former Mining Cities. The Role of Geographical Conditions and Local Interventions

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ABSTRACT

There is a specific group of former mining cities facing depopulation in Slovakia. They lost their key growth factor because their natural resources have been exhausted over the centuries or their extraction has become inefficient in the global economy. Nevertheless, even among them, we can find significant differences. We attempt to identify the drivers behind these surprising, at first glance, results, focusing on clusters of 15 cities with similar mining development grounds. We also try to identify some potential fields of action and good cases to cope with such development. We argue, that although cities and their local self-government have no chance to beat global market trends, or geographical location disadvantages, their reasonably intended activities can have depopulation mitigating effects at least in some of them. Such a chance is multiplied if a better intergovernmental support framework is available.

KEYWORDS

Depopulation; mining cities; geographical conditions; interventions; local self-government

Introduction

Urban demographic trajectories are unexpectedly differentiated in Slovakia. Of course, all cities' populations are getting older, and it is a definite general trend. Nevertheless, some cities enjoy a population increase by up to one-fifth in the last quarter of a century, while others have lost up to one-fifth of the population. There are differences in both natural increase and migration. Some cities benefit from both processes, but on the contrary, many of them face depopulation caused by similar processes. In other cities, the natural increase remains relatively high, but migration loss is increasing, and this is not only the case in cities with segregated Roma communities with higher fertility. Among Slovak cities, we can find a more specific group of mining cities, or in more accurate terms “former mining cities” because in most cases their natural resources have been already depleted, or their industrial extraction has become inefficient in the face of growing global competition. Nevertheless, they are deeply embedded in the Slovak urban system although with less clear perspectives. They are especially vulnerable as small mining towns in population terms and located in peripheral regions (as is frequent in more European countries, *e.g.*, Dale 2002; Marot and Harfst 2021).

Our goal is to identify the drivers behind these differences in the case of former mining cities. We divide the factors into two main groups. The first group is bound to the population and geographic factors; this means the primary factors that are outside the sphere of direct influence of local actors. We specifically name them in the next chapter. Demographic developments are understood as both a cause and a consequence in terms of urban development

progress, stagnation or deprivation, and therefore special attention is paid to them. Their detailed analysis enables uncovering the first part of the factors “puzzle”. Secondly, we assume that central state and local self-governments and local communities are not passive actors, are aware of such development, identify appropriate tools, and attempt to eliminate or at least mitigate the negative consequences of current post-mining developments. The different demographic trajectories can also reflect the diversity in local decision-making sphere activity. The hypothesis connected to the main goal is that geographical factors matter, and local authorities have only limited possibilities to influence local population development trends. However, we may also find exceptions that go beyond this hypothesis¹.

Theoretical and methodological framework

There is a relatively wide range of studies on depopulation issues. We can only very roughly divide them into two groups. The first group includes those addressing the causes and mechanisms of depopulation, with mostly demographic and geographical approaches to depopulation or its main driving forces, especially emigration (Stockdale 2002; Alamá-Sabater *et al.* 2021). The second group consists of studies that focus on the impacts and implications of depopulation. These works examine impacts on other demographic processes and structures, as well as effects on socio-economic development and society. A relatively heterogeneous set of approaches is used in this group; besides geography and demography, economic and political sciences deal with the topic to a considerable extent. The impact of depopulation on the economy was studied even for the nineteenth century (Baron 1980). There also exist studies – and not only those published in the last two or three decades – that combine demographic and non-demographic approaches (Laslett 1970; Lutz and Gailey 2020). Special attention is paid to the regional and local dimensions of depopulation, with a particular subcategory made of studies devoted to urban shrinkage (e. g., Buček and Bleha 2013; Haase *et al.* 2016) including shrinkage in mining cities (e. g., Martínez-Fernandez *et al.* 2012; Li, Lo, and Zhang 2020; Wu *et al.* 2022). Demographic change and related processes emerged also as a sub-field of quickly growing literature focusing on social aspects of mining closure (e. g., Bainton and Holcombe 2018; Carson, Nilsson, and Carson 2020). Also, the present study inclines primarily to this subject.

We may see a tendency toward a narrower or broader perception of the term depopulation in professional discussion; similarly in the case of the term shrinkage. Depopulation can be narrowly understood as an elementary population decline, *i.e.*, a decrease of population size. In a broader sense, phenomena as population aging, aging of the workforce, shrinking cohorts of women at the age of highest fertility, longevity, migration decline, and also natural decline are included here. On the one hand, it is obvious that narrow understanding does not give a true picture of all aspects and phenomena falling under the reduction of demographic dynamics and the decline in indicator values below critical limits – such as zero for natural increase or 100 for the aging index.

Depopulation is basically such a common term in the literature that there is no greater discussion about its definitions and understanding. It is understood simply as a shrinking of population, population decline. For comparison: if we spoke about the “depopulation of regions”, we would find dozens, maybe hundreds, of definitions of the term region in geography and regional studies. Therefore, depopulation is a much less understandable and much more debated concept. The frequency of the term depopulation increased after World War II. A cursory glance at older volumes of traditional journals suggests that it is an equivalent of French “depopulation”. But, quite logically, we can find this term in the French environment as early as the beginning of the twentieth century (Dumont 1890 and Bertillon 1911 in United Nations 1977). Depopulation and decline as concepts often occur in connection with the depopulation of rural areas (Johnson and Lichter 2019), while shrinkage as a term is associated rather with cities. We meet with the term rural depopulation again in France already almost 100 years ago (Thompson 1925).

Especially cities and urban regions strongly dependent on one type of economic activity are sensitive to depopulation. Mining is considered a traditional growth factor in cities. However, such cities face a set of problems related to the nature of mining in general, multiplied also by post-socialist transformation in many countries. Under such conditions, the key problem besides the non-renewability of resources has been long-term development outside global market competition. It accompanied underinvestment and the need to cope with stricter environmental regulations. Mining also faced general dynamics in this sector influenced by the rising concentration and role of large mining multinational corporations (*e.g.*, preference given to large, extensively equipped mines). It threatened the outlook of smaller and less efficient mines that faced closure or significant cuts in operations. Among their weaknesses, we can mention lower quality resources (coal, ores), location in the peripheral and remote areas, and dependency on state subsidies and other state interventions to operate. In some countries, including post-socialist ones, selected mining activities have lasted to avoid the risk of social and political tensions (large number and traditionally high status of miners within the society) thanks to their important linkages to other important economic sectors as energy and metal production (*e.g.*, Buček and Bleha 2022). There is little evidence of the expected trend toward more intelligent mining, applying new technologies, and higher productivity (Humphreys 2020). Among possible outcomes is also a search for new, balanced functioning although with less population. However, although in the case of mining, we can predict (with particular accuracy in advance) the decline in mining determined by the exhaustion of resources, technological limits, and market conditions (see *e.g.*, Martinez-Fernandez *et al.* 2012), the preparation in advance is frequently inadequate. An important aspect of the development situation concerns the timing of mining closure.

There are many cities all around the world coping with post-mining issues. They mostly focus on economic restructuring and diversification (often including a shift toward services, *e.g.*, tourism), culture and heritage protection, environmental revitalization and turn to sustainable development, quality of life and public services (to meet the needs of remaining residents), as well as an institutional framework (*e.g.*, Dale 2002 on Norwegian mining towns, Harfst and Wirth 2011 on mining regions in East Germany; He *et al.* 2017 on Chinese mining cities, Marot and Harfst 2021 on Central European cases). As cities facing economic and social decline are forced to adopt new local development policy tools (see *e.g.*, Dale 2002; Blakely and Leigh 2013). They can turn to planning activities, either integrative or addressing specific fields (economic, social, environmental). They can also address employment issues (*e.g.*, reskilling), business development (*e.g.*, business climate, business start assistance), locality and land development, human resources development (education and workforce training), community initiatives etc. It reflects those spatial development and planning theories focusing on the integration of central state regional policy and selected sectoral policies (*e.g.*, economic, social), as well as bottom-up based initiatives combined with the search for new endogenous local potential, and/or use of inherited capacities in a new way.

As it is frequently documented, the turn to multilevel governance approaches is frequent (*e.g.*, Harfst and Wirth 2011). In this study, we focus on two important stakeholders - central state (national policies) and local self-government. Among local and regional development policy clusters induced by the central state, we try to identify relevant tools and evaluate to which extent they are useful (*e.g.*, addressing lagging regions, industrial parks development, urban regeneration policies, or even explicitly addressing mining cities and regions). Local self-government possibilities are in general limited by their powers and the overall local finance framework. Nevertheless, they have the capacity to be active and participate in nationwide policies as well as to initiate their own tools. Local development can also be multiplied by attracting new stakeholders and exogenous resources, with EU involvement frequent in the European context (Widuto 2019; PwC 2019). We pay attention primarily to the tools that could potentially have depopulation mitigation effects and could influence the decision-making of the population not to leave or immigrate to the city (*e.g.*, family support, housing development, community social enterprises).

To analyze these approaches and responses we studied central state policy documents and legislation. We concentrate our attention on those existing policies and policy tools with an impact on mining activity in cities and their population development, as well as those that provide a support framework for differentiated local initiatives to solve their problems and how they were used in analyzed cities. It is the case of economic policy (energy and resources policies), regional development policy, employment and social policy (social economy, housing) and environmental policy. We also prepared our own databases based on data extracted from local budgets (city budgets and final accounts 2018-2020), local finance database (INEKO 2022), and national housing support projects (ŠFRB 2021). We went through obligatory prepared local planning documents (valid Programmes of social and economic development, Community plans of social services) in search of measures with impact on local population development adopted by local self-governments (*e.g.*, family support). We selected narrow group cities (within the text also as “reduced sample”) with some positive signs in population development (Modrý Kameň, Jelšava, Krompachy, Dobšiná and Nováky) for very detailed analyses within the final parts of the paper (*e.g.*, by using of local council meetings records).

Besides mentioned population and policy background, we are considering population development evaluation with specific reference to the following geographical factors relevant in Slovakia (Korec 2014; Michálek, Sládeková Madajová, and Podolák 2018).

- macroregional location and attractivity (poorer south-east east of the country and more developed west/northwest of the country)
- access to main transit roads (motorways, main railways)
- proximity to bigger urban centers (with key attention to larger urban centers above 50 thousand inhabitants and serving as important employment centers)
- existence of segregated, mainly Roma communities in the city or nearby
- suburbanization processes and position within the settlement system, including specific urban function allocation and status (administrative, tourist, other specific).

A brief profile of selected former mining cities

Mining had been among the most typical economic activities in Slovakia for centuries. The current Slovak regions were an important source of metals and energy resources for medieval Hungary or the Habsburg empire (including important mining and merchant families such as Fuggers). Part of this mining potential had been activated during the early stages of industrialization in Hungary in the nineteenth century (which included the current territory of Slovakia) and expanded during the era of early socialist industrialization. Nevertheless, due to limited resources, increasing difficulties in their extraction and rising costs slowly eliminated mining in many regions. As a result, we can find numerous cities with mining history. While some of them successfully turned to other economic bases and growth (*e.g.*, Banská Bystrica which lost its mining role very early), on the other hand, some of them declined and are now only small villages. We focus on the development of 15 former mining cities in Slovakia (although in many of them, the term “town” could be more suitable today). The selection criterion was that the decline in mining occurred during the last decades of the socialist period or after 1989 (so it does not cover all cities with such history). It means that it could directly influence the demographic developments during the last quarter of a century. Only in minor scope and only in some of them residual mining activity is still in process (*e.g.*, in Jelšava). Despite historically similar mining economic grounds, their development is diverse.

From the point of view of the primary mining base, we can observe two main groups of cities – coal mining cities and other ores mining cities. There are two brown coal mining clusters. One is the cluster in Horná Nitra with cities Prievidza, Handlová, Nováky, and the second

cluster with cities Veľký Krtíš and Modrý Kameň. Other ores mining clusters comprise cities Banská Štiavnica and Kremnica, and cluster in traditional regions Spiš (in German Zips) and Gemer with cities Spišská Nová Ves, Krompachy, Gelnica, Dobšiná, Rožňava, Jelšava, Hnúšťa, Tisovec. Their size distribution (Table 1) reflects their current less important role within the settlement system. Most of them (10 cities) have less than 10 thousand inhabitants while 5 cities are below 5 thousand inhabitants. There are only two mid-size cities – Prievidza and Rožňava. Only in a minor number of cities, we can observe any kind of population growth within the last 50 years. Geographically are cities located in less developed regions of Central and Eastern Slovakia (Figure 1). Only a few selected cities currently hold any specific function, the most frequent is the role of the administrative center at the district level (there are 79 districts in Slovakia). Some of them have valuable historical physical environments. The most valuable in this are cities Banská Štiavnica (listed in UNESCO World Heritage) and Kremnica.

Population development explained

The evaluation of the population dynamics over the past 25 years brings some interesting and also surprising findings. The overall context of development corresponds to fundamental changes in the Slovak population within the societal transformations following 1989. In addition, even in the former Eastern bloc then, Slovakia belonged to the group of countries with a higher reproduction of population and younger age composition (Potancokova *et al.* 2008). Another important fact is that Slovakia is markedly regionally and demographically differentiated. These

Table 1. Basic profiles of evaluated former mining cities.

	Population 1970 Census	Population 1991 Census	Population 2021 Census	Other specific function	Located in least developed district (2021)	Primary mining base	Mining activity termination
Banská Štiavnica	9118	10756	9628	District city, UNESCO list	No	Silver, gold	Ceased 1990s
Dobšiná	4368	4569	5102		Yes	Iron ore, polymetals	Ceased 1970s
Gelnica	4640	6277	5951	District city	Yes	Polymetals	Ceased 1990s
Handlová	17111	17835	16199		No	Brown coal	Ceased in 2021
Hnúšťa	5329	7146	6762		Yes	Magnesite	Continues
Jelšava	3538	2508	3209		Yes	Magnesite, polymetals	Continues
Kremnica	6121	6299	4934	State mint factory	No	Gold	Ceased 1970s
Krompachy	6250	8252	8739		Ye	Polymetals	Ceased 1990s
Modrý Kameň	1793	1374	1620		Yes	Brown coal	Ceased 2010s
Nováky	5367	4341	4197		No	Brown coal	Planned termination in 2023
Prievidza	28425	53424	45017	District city	No	Brown coal	Planned termination in 2023
Rožňava	11075	18632	17569	District city, Seat of bishop (Roman Catholic)	Yes	Iron ores, polymetal	Ceased 1990s
Spišská Nová Ves	22345	39218	35431	District city	No	Iron and copper ores	Ceased 1990s
Tisovec	4615	4430	3720		Yes	Iron ore	Ceased 1960s
Veľký Krtíš	4425	13686	11028	District city	Yes	Brown coal	Ceased 2010s

Source: Adopted according to Statistical Office of the Slovak Republic (2003, 2022); Office of the Vice-Premier of the Slovak Government for Investments and Informatization (2022); State Geological Institute of Dionyz Stur 2019.

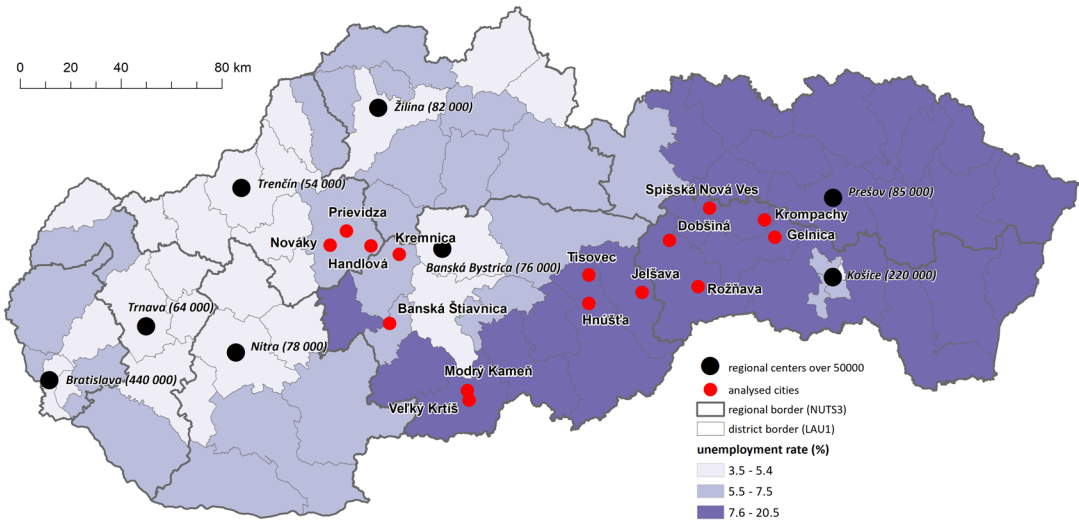


Figure 1. Cities location to regional disparities and bigger cities/regional centers (2021).
 Source: Adopted according to data available at Statistical Office of the Slovak Republic (2021)

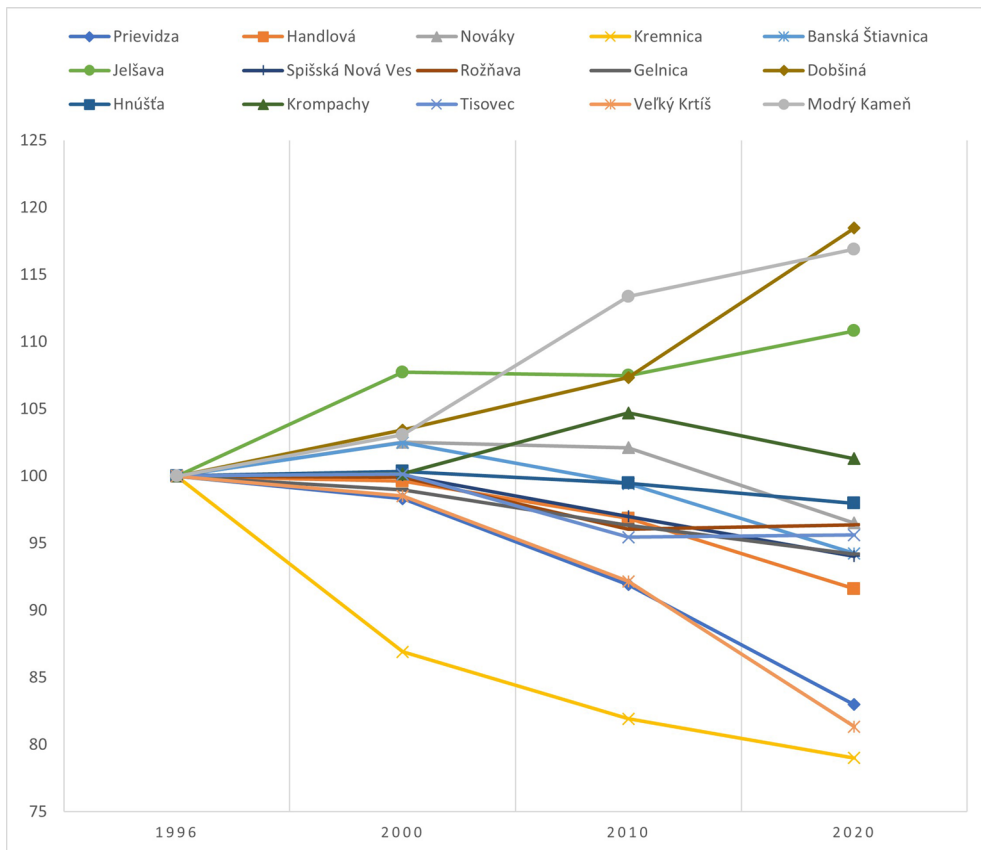


Figure 2. Index of population change in selected cities (1996=100).
 Source: Datacube of Statistical Office of the Slovak Republic

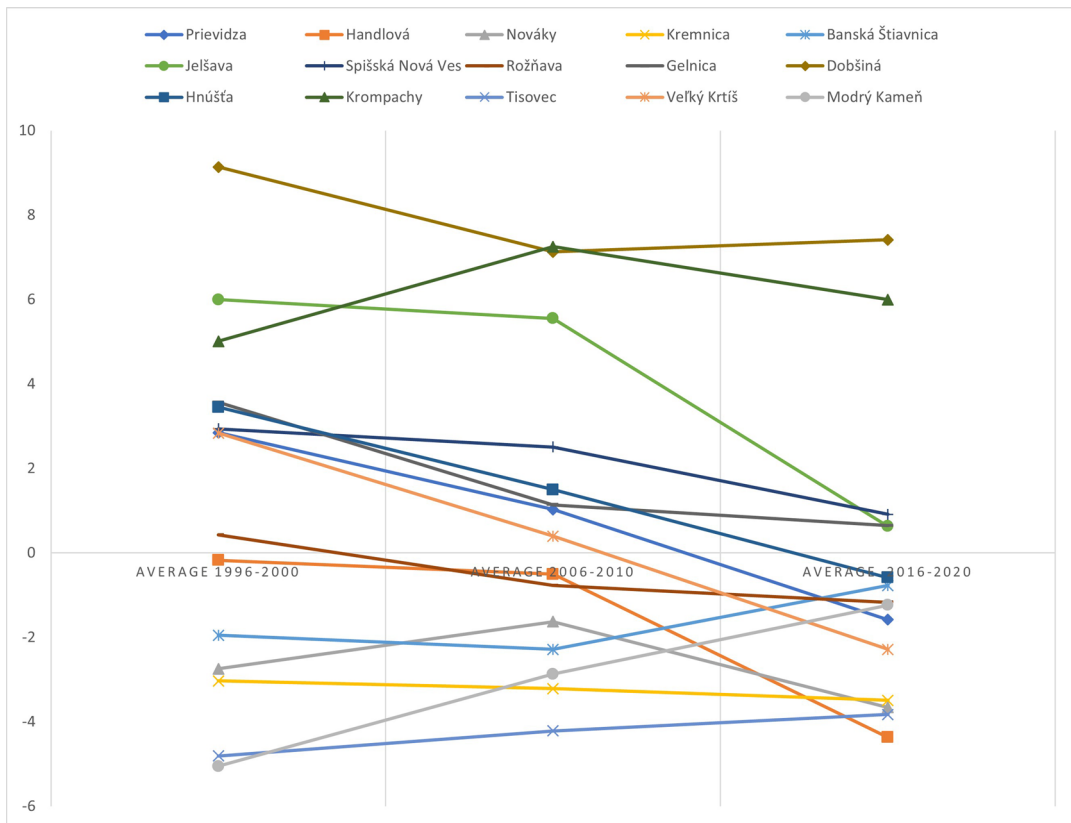


Figure 3. Natural increase in selected cities (per thousand).
Source: Datacube of Statistical Office of the Slovak Republic

differences also apply to the relation *center (city) – its hinterland*. Figure 2 shows the different developmental trajectories for the number of inhabitants. Most cities have witnessed a change in their number of inhabitants roughly to 5% compared to the base year of 1996, with the vast majority experiencing a population decline. Furthermore, there is a group of three cities with a considerable 15 to 20% decrease. The main demographic components of this decline and their probable geographical and socio-economic causes are analyzed more in detail below.

On the other hand, there are three Slovak cities with a higher than a 10% increase in population, exceeding 15% in two of them. From the viewpoint of natural increase, differences were substantial throughout the examined period. Most cities recorded a natural decrease in the entire period (Figure 3), or they reached negative values in the last analyzed period of 2016-2020.

Total fertility is an essential differential factor of natural movement in the set of evaluated cities. In the cities of Krompachy and Dobšiná with above-average natural increases, total fertility was well above average too – always around the replacement level 2, despite intensive transformations that were taking place in the country and in regional populations (Bleha and Ďurček 2019). The fall in fertility in other cities at the turn of the millennium just copies the nationwide development and that in other cities in Slovakia. However, recuperation is still very slow and most cities do not even reach the lowest-low fertility rate of 1.3 children per woman. The only exception is the city of Krompachy, whose total fertility rate (TFR) has returned from the lowest-low level to the replacement level since the beginning of the millennium, which is rather surprising (Figure 4).

The single city with a high representation of segregated communities, Dobšiná, did not face such a decline. Other Slovak cities do not yet copy the trend of the largest cities in the

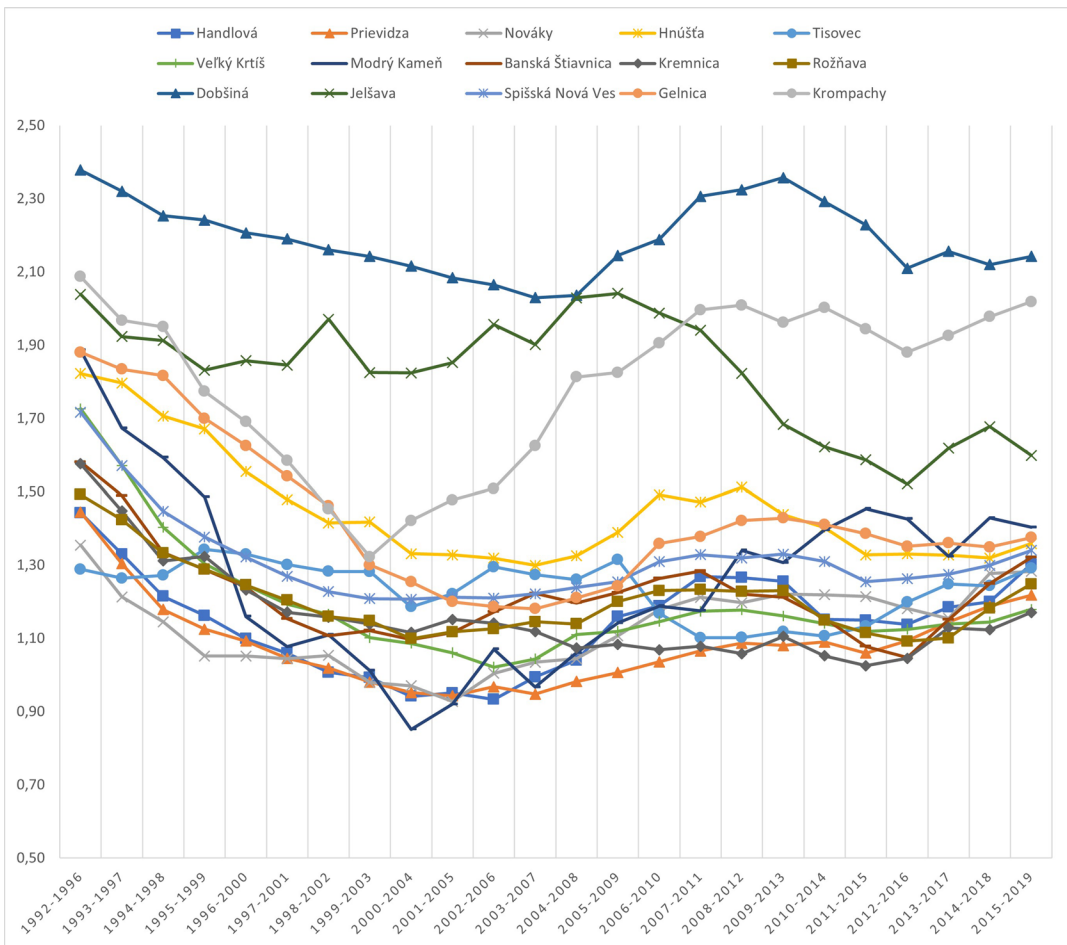


Figure 4. Total fertility rate in selected cities (children per woman).
Source: Datacube of Statistical Office of the Slovak Republic, own calculations

country, where recuperation is evident, especially in Bratislava, but also in other cities with more than 50,000 inhabitants (Šprocha *et al.* 2017). Out of the Slovak largest cities, it was only in Prievidza – as part of this analysis too – where the fertility recuperation index after 2010 was not higher than the national average. This city is an example of the negative demographic development in terms of natural movement and migration.

At the local level, migration plays an important role as well. Unfortunately, the Slovak statistics do not produce data on international migration for the cities, so we cannot work with them and have to be content with those on internal migration (Figure 5). The curves of internal migration balances have varied considerably over the past 25 years, but most cities lost populations due to migration. Two cities even recorded a relative loss of 1% per year. The city of Nováky has a slightly positive net migration, while the city of Jelšava shows significant fluctuations. The city of Modrý Kameň – as the second smallest city in Slovakia (less than 2,000 inhabitants) – is the only one gaining population greatly through migration. To a certain extent, the curve of net migration of this city has an inverse shape compared to that of the Veľký Krtíš city. This was most apparent in the period of 2010-2013, when the number of emigrants from Veľký Krtíš accounted for 60 to 70% of the total number of immigrants to Modrý Kameň; for the whole period since 1996 it has been more than 50%. In this way, a district, much bigger, city with over 11,000 inhabitants has lost its population

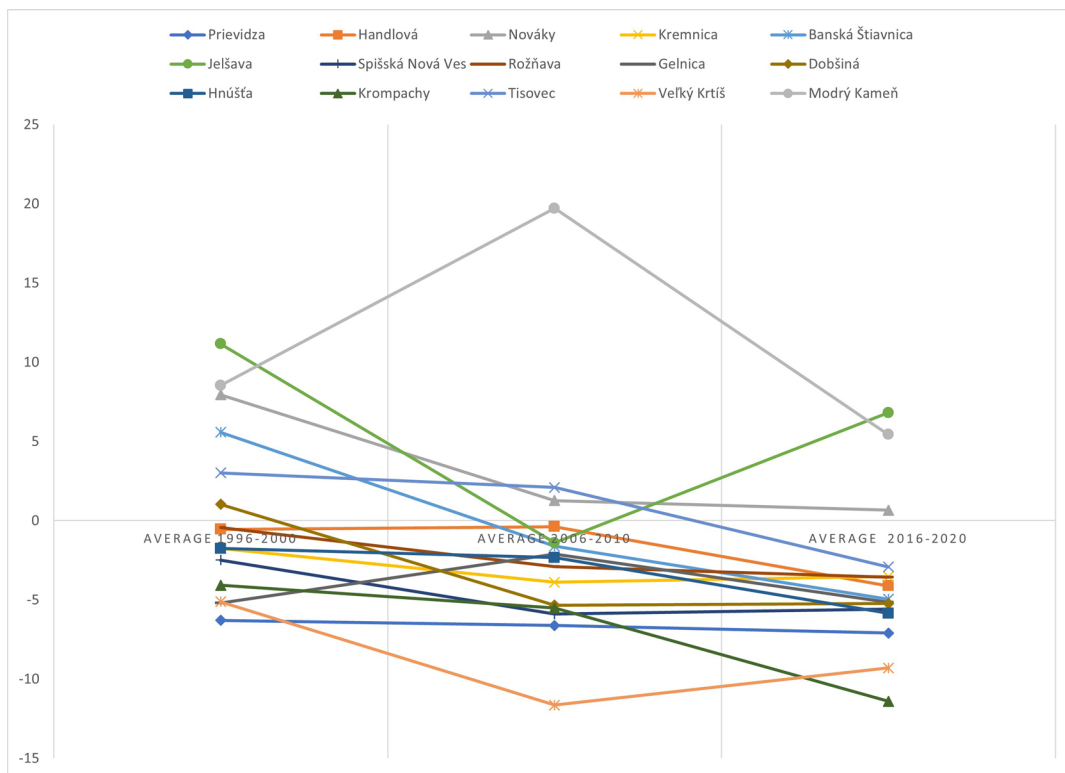


Figure 5. Net migration rate in selected cities (per thousand).

Source: Databcube of Statistical Office of the Slovak Republic

at the expense of a small city, merely four kilometers distant. Of course, the role is played here by a substantially different population size. Nevertheless, even the absolute migration flows from Veľký Krtíš are larger than the opposite flows. Though it is formally "urban-to-urban" migration, it is in fact a suburbanization trend. Simultaneously, both cities have the same geographical location, they lie in a poorer peripheral border area with great distance from large cities.

It can be stated that the trend of moving to the hinterland of cities, which began in the Slovak capital (Bratislava) and its hinterland about two decades ago, is already a fact also in cities with a population of 15-20 thousand. This is confirmed by examples from other regions.

On the other hand, the city of Veľký Krtíš has long been the core of a functional region defined on the basis of daily commuting to work at least in three censuses – in 1991, 2001 and 2011 (e.g., Halás *et al.* 2019). Slovakia is characterized precisely by the fact that migration within the LAU 2 regions represents the highest share in the total volume of migration. At the same time, the number and share of long-distance interregional migrations are also growing, particularly those from eastern Slovakia to the region of Bratislava and other larger Slovak cities in the west (Kakaš and Gruber 2016). The given pair of cities (Veľký Krtíš, Modrý Kameň) is thus a clear example, when a single process plays a dominant role and considerably influences the demographic dynamics, and also partially reduces the intensity of population aging. It is probable that Modrý Kameň – due to its peripheral geographical location and weak economic base – would be a city with a negative migration balance without the existence of Veľký Krtíš.

The aging process is universal and, with the exception of cities in the hinterland of other cities where suburbanization is taking place, all regional and local populations are aging. This is also confirmed by the curves in Figure 6. However, the level and pace of aging are substantially different. Cities as Dobšiná, Jelšava and Krupčany show significantly lower values of

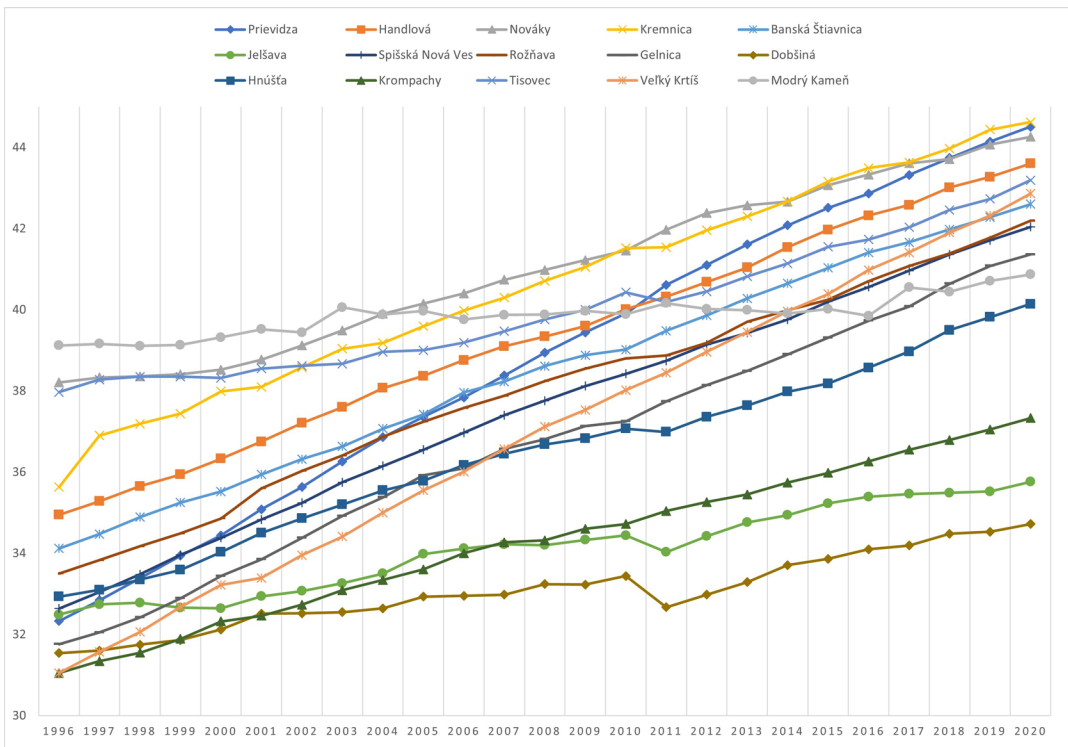


Figure 6. Mean age of population in selected cities.
Source: Datacube of Statistical Office of the Slovak Republic, own calculations

mean age and also below-average growth rates in the past 25 years. On the contrary, the highest values of mean age (around 44 years) – markedly above the Slovak average (less than 42 years) – are in the group of cities in central Slovakia. A comparison between the cities of Veľký Krtíš and Modrý Kameň is interesting in this context again. Mutual migratory relations substantially affect demographic aging. In the cities of Dobšiná, Jeľšava and Tisovec, mean age is below-average and the growth rate is positive owing to a higher representation of Roma population, which is characterized by above-average total fertility and a higher number of inhabitants at the age of highest reproduction. Although these cities lose their productive populations due to migration, higher fertility slows down depopulation and aging.

It is possible to make some generalizations. The slump in mining and the given geographical location are the fundamental determinants for the demographic development of all analyzed cities. The group of five cities located in Central Slovakia indeed benefit from being situated in economically somewhat better-developed regions compared to the location of other cities. But, in comparison with the "wealthier" west and northwest of Slovakia, their situation is not favorable, as demonstrated in more detail on the example of cities of Prievidza and Banská Štiavnica by Buček and Bleha (2022).

As regards cities in the southern and eastern parts of the Slovak Republic, all of them – from the pair Veľký Krtíš/Modrý Kameň to easternmost Gelnica – are located in the least developed regions, taking into consideration their level of development, as was identified by several studies (Korec 2014; Michálek, Sládeková Madajová, and Podolák 2018) or central state regional development framework (Act No. 336/2015). This is also manifested by values of negative net migration, which is compensated by higher natural increase in some cities. This increase is due to the younger age structure of Roma population and the overall lower educational level of population with higher fertility (Šprocha and Bleha 2018). Therefore, these cities

are aging slower. However, relatively positive developments do not go hand in hand with improving the socio-economic level of cities and with the integration of local segregated communities. At the same time, segregated communities have lower mobility and willingness to migrate.

On the whole, it can be stated that the geographical position of cities from the viewpoint of regional disparities plays a crucial role in their demographic development. After a sharp decline in mining, the cities in the respective regions then failed to undergo a successful economic transformation. This also applies to the lack of foreign investments that are much more directed to other Slovak regions. In some cases, however, the situation is modified by local particularities. The administrative functions of cities or access to main transit routes appear to be minor differentials, but some demographic and geographic determinants are effective in terms of inducing the differences. It may seem that in most cities the population loss is not significant, and shrinking is thus not of interest for research. However, the heterogeneity of development trajectories is still interesting. Despite almost all cities are in underdeveloped regions and have a weak economic base, there are significant differences in population dynamics between them. Surprisingly, three cities in relatively stronger regions have the largest demographic losses. Only a closer look at the age and ethnic composition, fertility rate and the net migration reveal closer differences. Example 1 – a sufficiently large young Roma population induces demographic growth, although poverty is preserved in this community at the same time. The self-government does not have to do anything, and the population does not decrease. The population growth rate looks favorable, at least at first glance. Qualitative, “social-demographic” shrinking is strong. The second example is opposite: an activity of Modrý Kameň self-government was recorded and helping to attract some people from bigger Velký Krtíš. The city compensates for the loss of educated young people by immigration from another city. However, a closer look at the data will show that many young residents leave the city for developed regions. Suburbanization is only a kind of “band-aid”. Even together with the curve of the migration balance, the population growth curve tells a lot, but not everything. We have indicated this in this chapter. If a comparative geographical advantage does not exist, which is the case in most of the investigated cities, but especially in the three most shrinking cities, there is nothing to reverse the shrinking. In these cities, all negative factors, low birth rate, emigration, older population causing aging “from the middle of the age pyramid” manifest themselves multiply. Of the five geographic factors listed above, only two are effective for a few of analyzed cities. But is it hopeless? To answer this, in the following chapters we will analyze some activities that at least slow down shrinking or can theoretically slow it down.

Upper levels of government in addressing mining cities

The situation in mining cities is also influenced by the decisions of the upper levels of government. The key role has central state policies addressing cities, natural resources extraction and regional development, as well as some other sectoral policies. There is no tradition of explicit general urban policy or policies addressing specific urban issues (like urban shrinkage, depopulation) formulated and implemented in Slovakia. Urban problems had been partially addressed in pressure for better planning framework, or within sectorally oriented policies addressing, *e.g.*, housing. The most important impact has been the introduction of the requirement for more complex approaches to planning. Traditional territorial planning (Master Plan adoption for physical development regulation) was supplemented by obligatory plans addressing local economic and social development. It means that local elites and local communities in all cities are dealing obligatory with their development problems and future in a form of plans that must pass their local representative bodies. Such planning documents are often inevitable to have access to various development funds and programmes. Certain opportunities in urban development provided Operational Programmes financed by the EU funds (*e.g.*, focusing on urban regeneration,

green infrastructure). Only since mid the second decade have urban issues been more extensively discussed and a new Urban Development Strategy had been adopted by the central government (Ministry of Transport and Construction of the Slovak Republic 2019). Partly, it was initiated by the EU policy shift paying more attention to urban development agenda. However, they do not explicitly address cities with mining-based development profiles and lack detailed tools and implementation.

The central state operates through various sectoral policies that have an impact on cities. Its interest in mining (and indirectly in mining cities) is expressed in economic and energy policies. Coal mining has been supported for decades by extensive state subsidies as a part of its energy policy (Haluš 2011). However, such support had not been available on a scale comparable to that of other mining regions. Another case of relevant sectoral support concerns housing. Among various tools applied in this field is also the support of rented housing with subsidies and accessible borrowing for local self-government (*e.g.*, Act 150/2013). Again, also in this field, it is a general tool, not addressing specifically mining cities. The central state field offices of state administration also maintain and finance the social security system including support for unemployed, vulnerable and marginalized communities etc. Therefore, it does not mean any extra load on local self-government finance in mining cities.

A major part of mining cities is located in lagging regions, which means that they have access to support in these regions. It is based on legislation addressing the least developed regions (Act 336/2015) covering 20 administrative districts (2022) by financial contribution for selected projects. It is based on partnership-based development planning at the district level. It is available for 8 cities in our full sample. However, support is fragmented into small projects, in financial terms rarely exceeding 100,000 euros, and it has only limited impact. Only a minor number of projects supported is important in generating new workplaces. In most cases, it concerns “public consumption” improvements, namely, the renovation of public facilities, schools, the reconstruction of historic heritage, tourism and public services provision (Office of the Vice-Premier of the Slovak Government for Investments and Informatization (2022)). Nevertheless, they contribute to the quality of local life.

More business development objectives have regional investment aid (Act 57/2018) and industrial parks support (Act 193/2001). As far as our sample cities in preferred regions are concerned, the inflow of investments is limited. More of them obtained subsidies for industrial/business park development (mostly brownfields conversion) as, *e.g.*, Gelnica, Hnúšťa, Krompachy, Rožňava, Spišská Nová Ves (Ministry of Economy of SR 2021). Although cities offer suitable development sites it is not easy to attract larger investors despite state support (provided for adaptation, infrastructure improvements, land expansion, workforce requalification). A minor number of new investors are attracted to cities in our reduced sample (*e.g.*, Modrý Kameň). Nováky and Krompachy still have their own larger employment base (mostly in industry, including those surviving the end of mining in the region).

Since joining the European Union, its role in addressing urban issues as well as mining is important. Measures focusing on cities are included within selected Operational Programmes and specific initiatives are related to the EU coal exit strategy. However, urban issues addressing measures do not take into account the specific problems of former mining cities among supported activities. They had no priority so they compete for standard support for projects for example targeting settlements regeneration, green infrastructure, social services facilities, public space revitalization, housing for marginalized communities (Ministry of Agriculture and Rural Development 2022a, 2022b). It was used by cities in our sample and contributed to various aspects of quality of local life but less explicitly addressed more sensitive issues such as population policies. However, the EU’s role is very important for coal mines closure in the region with the cities Prievidza, Handlová and Nováky. It is part of EU financed phasing out of mining and coal-based energy production within the EU (*e.g.*, known as the European Green Deal). EU institutions (including specialized ones such as the European Commission’s Initiative for Coal Regions in Transition), expertise and funding are very important in developing adaptation

programmes. It means that this group of cities will be less vulnerable (e.g., Widuto 2019). It is already visible in a more elaborated and ex-ante approach to the closure of the last mines in Slovakia and influences the fate of mentioned cities (PwC 2019). However, such a predictive planning framework was missing in a case of other cities.

Important factors in the central state's attention to cities are their role in national or even international economic and historical perspectives. There is a different approach to historically important cities as well as to coal mining cities with an important role in the Slovak economy, primarily its energy needs. It is especially the case of Banská Štiavnica due to its unique role in Slovak history, and its listing as a UNESCO heritage site (since 1993) expressed also in unique legislation addressing the protection and development of this city (Act No. 100/2001 Coll.). Banská Štiavnica and another historically very important city Kremnica (e.g., mint factory operating already since 1328) regularly obtain subsidies to protect their cultural heritage from the state budget.

Previous paragraphs indicate another important factor in the central state approach to mining cities - the time context of mining decline or closure. The central state can be in various conditions, has various capacities at its disposal (expertise, financial resources), and can follow different priorities. Limited capacities of the central state in the early post-socialist transition (busy also with new state building in the case of Slovakia) left many mining cities without any elaborated and managed processes of mining phasing-out. Former mining cities frequently suffered during "shock economic reforms" and quickly lost their mining activities, related employment and vision of the future. During the post-socialist transition with its liberal framework and privatization (often with strange rules), it was one of the sectors that faced serious obstacles concerning its competitiveness (low productivity, technology lag, environmental degradation). This development accompanied the absence of any specific policy focusing on the mitigation of the mining closure effects, except core coal mining, which is crucial for energy security reasons. It means that only the last cases of mining closures are accompanied by a more elaborated policy multi-level governance framework, relevant measures, funding available and serious attention paid to its post-mining conversion. The fact that the last mining region/with cities is going to be closed within a more serious EU framework is also different when assistance is more extensive and more focused on the mining regions.

Local self-governments in addressing local population development related ISSUES

Local self-government can have an important role in addressing negative population development tendencies using their capacities as well as the general framework provided by the central state, usually requiring local self-government participation (planning, projects, co-financing, implementation). Nevertheless, Buček and Bleha (2022) already identified some general obstacles that limit its role in local development in Slovakia. The most critical are financial consequences. The local tax base significantly erodes and has an impact on the local self-government budget. The most serious is the decreasing financial flow from shared taxes (calculated according to the local population number) and the stagnation of property tax revenue (due to the worse local economic and social situation, the local real estate market is under pressure). Similarly, they face difficulties in maintaining the scope of local public services (e.g., primary education facilities funding is derived from the number of children, which is decreasing). On the other hand, there is also a growing demand for other types of social services in the context of aging or health problems. Population decline also influences the provision of other local services facing the pressure of a deteriorating scale economy. We identified a set of local self-government powers and activities that could be exploited in addressing depopulation. We focus primarily on selected issues in local planning, local finance and budgetary policy, housing and social enterprises initiation. We have no chance to address and evaluate all aspects of local economic and social development that could influence such complex phenomena as depopulation.

We can observe a very important shift in addressing the local social and economic situation in cities thanks to the innovations in the field of local planning introduced during the last twenty years. Cities are now required to prepare a set of regularly updated planning and programming documents by legislation (Act 503/2001, Act 539/2008, Act 448/2008). The key development document is the Programme of Social and Economic Development and more specific is Community Plan of Social Services. These partnership-based documents should also provide a basic local framework also in addressing various aspects of depopulation tendencies, motivate development initiatives, including policies addressing the most sensitive issues like housing, social infrastructure and services, family support, and education (pre-school, elementary school). They also should deal with possibilities in local economy restructuring. Although they are prepared with different qualities or face obstacles in implementation, they contribute to raising awareness of current population development. Usually, they provide enough analytical information on various aspects of the population social and economic development. Planning and programming activities offer a reasonable platform to proceed to a local policy framework to address local issues more efficiently. Afterwards, they can be more easily converted into practical decisions influencing local life. Even though there are rare cases of attention to depopulation or similar processes (Buček and Bleha 2013), such obligatory pressure to consider own development was missing through previous eras.

Cities' self-government functioning and their activities are strongly dependent on their financial situation. They can limit their ambition to influence population development and on the other hand, they can also suffer in this field under population decline. One of the main sources of local budgets is personal income tax (PIT) yield calculated primarily on a base of population number. As a result of population decline, local self-governments face a significant decrease in income potential, partly balanced by the general increase of PIT due to a positive economic situation.

We can estimate the local self-government situation in particular cities in general according to their expenditures. We used three years averages to avoid eventual year to year oscillations (2018-2020, own elaboration of data available at INEKO. 2022). We focus both on current expenditures (covering operation costs) and capital expenditures (mostly used for investment activities). The average current expenditure spending per capita is 784 EUR for the whole sample. In the case of a reduced sample, most of the cities are above average in spending (with Nováky and Jelšava even above 1000 EUR per capita). Average capital expenditures on a per capita basis are much smaller (113 EUR for the whole sample of cities). They are above average in almost all cities of the reduced sample (for example it is 293 EUR in Dobšiná, 571 EUR in Modrý Kameň). The city of Krompachy is the only case in our reduced sample with below-average expenditures (both current and capital).

Property taxes (real estate) are one of the relevant indicators of the local economic situation as well as their contribution to the fiscal income of local self-government. In this case, we can use one year date reflecting the local situation (data extracted from cities' final accounts/annual reports). Property taxes income is quite stable, less elastic, with only minor responses to the economic situation (changes in real property taxation are usually small and slow). The average property tax income in our sample is 57 EUR per capita (2020). When focusing on our reduced sample of cities, most of them have property tax income below this average, but very different is the situation of Nováky in which property tax income per capita is 287 EUR (mostly thanks to large corporations still operating on their territory, but with a risk that this income can decrease in long term perspective). The property taxation level is acceptable from citizens' point of view and the main differences are caused by business entities' property taxation.

Similar property-based-evaluation can be based on municipal property in these cities. The average municipal property value per capita in our sample is 3562 EUR, while in our reduced sample it is 4690 EUR per capita (2020, final accounts/annual report). It indicates higher attention of local self-government primarily to public services and related infrastructure (e.g., local facilities, schools, public housing...) because the municipal property is usually strongly linked

to their activities and priorities (land and buildings are the most valuable). For example, it is almost 9000 EUR per capita in Modrý Kameň or more than 6000 EUR in Dobšiná and Jelšava. However, it is below average in Krompachy and Nováky.

Financial contribution at childbirth is one of the tools that are more frequently applied across Slovak local self-government. In addition to the more generous financial contribution provided in childbirth by the central state, many local self-governments began to provide their financial contribution. It is only a minor amount of local budget resources (usually on a scale of thousands of euros a year), having a more symbolic expression. It is applied within the framework of local social policy with an additional impact on the stabilization of the local population and making positive ties to the city. Surprisingly it is not applied in most of our sample cities. It is used in a group of cities facing the latest coal mining closures (Prievidza, Handlová, Nováky). Among our reduced sample, we found the city with the largest contribution (the city of Nováky provides 300 EUR pre-new child in two instalments). It documents the search for all possible tools to stabilize the population or attract new families to the city. It is also an expression of effort in a more competitive environment of nearby mining cities in this region close to complete mining phasing out.

Housing is an important aspect of the local population stabilization. It is primarily considered a private issue, but the support of the state is available. Due to the worse social and economic situation in former mining cities, buying a house/apartment is not an easy alternative. It is also an important fact that housing is not among the obligatory power of local self-government. Nevertheless, facing worsening population development, many local self-governments consider this issue important and intervene in this field. Another factor is that there is a worse housing situation. While there is an average number of 2,4 people per apartment in the whole sample, there are three cities in our reduced sample with about 3 people per apartment (Jelšava, Dobšiná, Krompachy), while the situation is better in Nováky and Modrý Kameň.

Local self-government can ask for financial support for new rented housing (ŠFRB – State Fund for Support of Housing 2021). Cities usually combine state fund subsidy, low-rate credit and own co-financing. The demand for local public housing usually exceeds the available supply in cities. Based on our research database we identified that the cities of our sample had built almost 1100 apartments with state support for rented housing (period 2000-2019; ŠFRB 2021), with an average number of 5.8 apartments per 1000 inhabitants. Among cities included in our reduced sample, only in the city of Dobšiná, this activity was below average (3.5), but highly above average, it was in Krompachy (6.6), Nováky (11.4), Jelšava (17.0) and Modrý Kameň (36.3). Cities like Modrý Kameň enabled new inhabitants to stay or immigrate thanks to extended public housing provisions (*e.g.*, moving from neighboring Veľký Krtíš). In addition to apartment houses, it also supports the construction of individual new housing. An important factor is that it also offers a more attractive living environment, not far from the larger city. In this small city, even a small number of new housing matters. This activity of local self-government we can consider relevant and influencing positive population growth.

Another possible initiative in favor of the local social situation and support of local development is the establishment and operation of social enterprises as a specific form of social economy in Slovakia (Act 112/2018). It is expected that they will have a positive social impact by addressing social inclusion, employment and social cohesion. It can be a useful tool to support former mining cities with their more difficult social and economic situation. Registered social enterprises thanks to their status have more extensive access to various forms of support (concerning taxation, procurement, contracts). Despite we are working only with the sample of 15 cities according to the social enterprises' register (Ministry of Labour and Social Affairs and Family 2022) there are already working 47 of them (9% of total social enterprises in Slovakia to the end of 2021) and in some cities, new enterprises are in preparation. It documents higher attention to the social and economic situation in these cities. Currently, only in three cities of our sample, there are no social enterprises. Although it provides limited effect at this moment,

it documents a rising effort to stabilize the local social and economic situation. When focusing on our narrow sample of five cities, there are social enterprises operating in four of them (in two cities established by local self-government, Jelšava and Modrý Kameň). A larger number of social enterprises is understandably in larger cities of our sample (Prievidza, Handlová, Spišská Nová Ves, Rožňava, Veľký Krtíš), although their total impact on the local economy is smaller. It seems that they can be one of the possible fragments of local policy addressing social-economic issues, as well as population stabilization.

Conclusions

Despite many similar features, former mining cities exhibit different development patterns in Slovakia. They are distinct in their various aspects of population development and reflect the impact of various geographical factors. Nevertheless, we can observe more cities using various tools and support frameworks to improve local social, economic and population situations. Among important general factors, we have to mention the functioning of a multilevel governance framework (local, regional, state, EU) and time aspects in addressing mining and urban development issues. It caused especially during the decade after 1989 problems of cities losing their mining activities have hardly a chance to respond, and the capacities of the central state also had been very limited (and “regional state” was not existing). It supports the opinions on the importance of multi-level governance capacity building in addressing former mining regions’ problems (e.g., Harfst and Wirth 2011). We cannot underestimate the wider economic importance of particular mining activities to address their consequences.

We discussed several factors that influenced the ability of cities to cope with depopulation. In some cities, even small geographical advantages (local and regional conditions) matter. Some of the former mining cities can exploit the “neighbourhood” effect of larger cities if offering good quality of life, access to housing, other social infrastructure and urban life amenities, so they participate in the process of mini-suburbanization flows. They can exploit their proximity to the larger urban center advantage, with good conditions for commuting and access to higher-level central services (Nováky, Modrý Kameň). The situation also stabilizes a reasonable level of saved local economy functioning providing sufficient and more stable work-places observable in the case of smaller cities (e.g., Nováky, Jelšava, Krompachy). In some cities, a positive population impact has Roma community living in the city (Jelšava, Krompachy). However former mining cities require more specific attention primarily considering the need for their economic restructuring, post-mining environmental stabilization and protection of cultural and technical heritage accumulated over centuries. They manifest an important part of national history, and more of them were crucial from the point of view of urban system development in Slovakia. They concentrate remnants of various mining-related activities generating more complex problems and needs for suitable long-term measures not typical for other deprived areas (e.g., former mining areas maintenance and monitoring, mining waste and land rehabilitation, prevention of water and soil resources contamination, cessation of potential geological activity as landslides etc.). They concern not only those living in cities but wider surrounding territory. In the case of a small country, an alternative of simply abandoning of former mining territory forever is not possible. It still can be considered as an opportunity that could be exploited although in a new way in future. Nevertheless, it is not easy to address more general and fragmented activities supported by the central state, e.g., the environmental burdens of various origins (e.g., Ministry of Environment of the Slovak Republic 2021).

A presented brief introduction to the selected local self-government activities indicates that there is a potential for suitably-shaped and active policies influencing population development. Among crucial matters that we have to emphasize is the role of sufficient powers of local self-government. The possibilities of local self-government improved the decentralization of powers and fiscal decentralization after 2000. It accompanied more elaborated regional

development and sectoral support policies (e.g., in housing). There is a chance to find a suitable mixture of interventions exploiting upper-level governments framework, proper use of financial resources (mobilizing various income sources and reasonable expenditures orientation), and selecting suitable fields of action which can lead to mitigating effects or can contribute to potential stabilization of population. Various aspects of local life influence the decision-making of the local population and cannot be underestimated. The activity and quality of local self-governments and governance environments are different among cities and can have an influence as well. Nevertheless, even in at the first sight, less successful cities, we can observe a search for changes in a local situation. For example, city Velký Krtíš inspired activists to the „speculative “project *Realistic Utopia Velký Krtíš* (Kučová 2019), combining interdisciplinary professionals (anthropologists, architects) and local people – searching how to live “at the periphery”.

Our input addressing the population situation in former mining cities indicates that we should not be fully skeptical. Nevertheless, as well as on an international scale (e.g., Marais *et al.* 2018; Li, Lo, and Zhang 2020), also at a national scale, there is no “one size fits all” approach in shaping policy response to mining cities’ depopulation. There is a chance for local self-government to mitigate depopulation, although it is not fully in their hand. They can develop their own locally shaped mixture of initiatives and tools. We can observe signs of seeking locally suitable measures respecting geographical conditions, local employment and commuting opportunities, housing and living conditions etc. Despite possible criticism of the role and the scope of the upper levels of government interest, there is an available framework now that can be helpful. Probably, cities, their representatives and citizens have no chance to beat geographical location disadvantages or global market tendencies, but they can act, and their activity can be rewarded. Well-motivated, reasonable and decisive local self-government, supported by other actors can be at least partially successful. It is probably not possible to turn these places into rich, growing “oases” within depopulating regions in a decade or two, but it is possible to at least slow down the negative trends. The advantage of some cities is that they still have an above-average reproductive potential and a younger age composition, despite the labor emigration of younger residents. However, actions need to be very intensive, as geographic conditions are a strong adversary in most of the regions studied.

Note

1. This research idea was presented for the first time at the WITTGENSTEIN CENTRE CONFERENCE 2021 entitled THE CAUSES AND CONSEQUENCES OF DEPOPULATION (Bleha and Buček 2021). Only short and extended abstracts have been published. The final compact research is published for the first time in this study.

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Data availability statement

Local documents – Annual reports, Programmes of social and economic development, Community plans of social services, local budgets and final accounts for cities, local council meetings records – Nováky, Modrý Kameň, Jelšava, Krompachy, Dobšiná – available on official web pages of cities in Slovak.

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