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Socio-spatial change in Lithuania

Depopulation and increasing spatial inequalities

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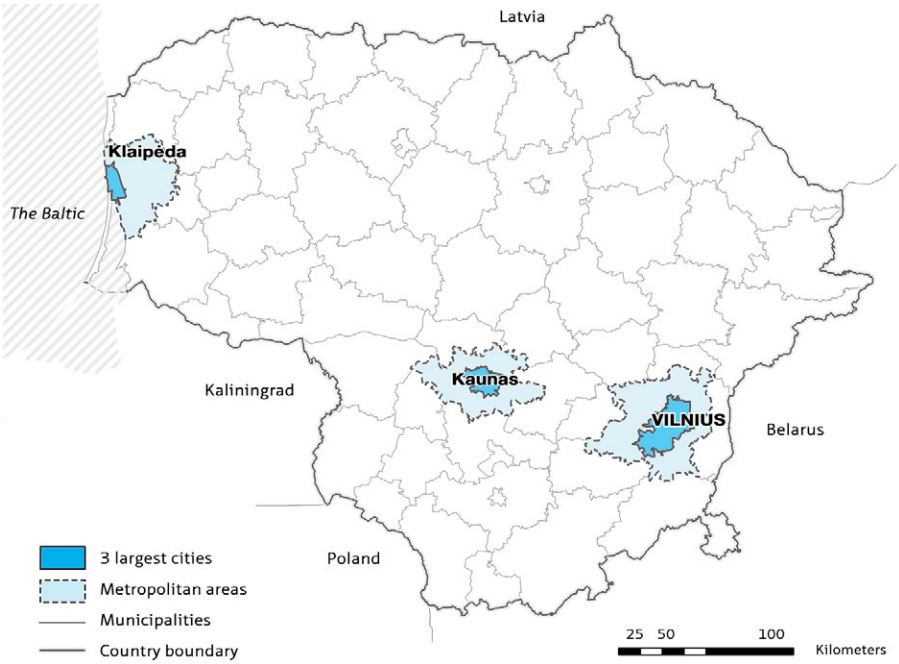
To my beloved family

Foreword

Lithuania is a small European country (pop. 2.9 million in 2016), located on the eastern border of the EU, surrounded by Latvia, Belarus, Poland, Kaliningrad Oblast (Russia) and the Baltic Sea. Quite recently, in 1990, the country regained its independence from the Soviet Union and began a process of democratic development. Both its peripheral geographical location and its history have created demographic and economic challenges that Lithuania has had to face over recent decades. The most significant issue is the huge drop in population, with Lithuania losing more than 20 percent of its inhabitants since the 1990s, which makes it one of the fastest shrinking countries in the world.



Lithuania

Despite the fact that significant changes in the Lithuanian population have been occurring for three decades, they have only recently started to attract greater media attention. However, many issues related to population change still receive little attention in the scientific and political domains. There is no clear strategy designed to

cope with the extreme population decline and its consequences. It is a paradox that current regional development policy is guided by growth-oriented regional planning documents. Moreover, these documents were prepared when the depopulation trend already prevailed. However, extreme depopulation can no longer be ignored in Lithuania.

As there is little hope of reversing the ongoing trend, it is important to find coping strategies that can reduce the negative consequences. If not, Lithuania will encounter serious threats to its social and economic stability in the near future. One of the measures that could help to cope with these threats is more effective regional planning policy. To develop this, it will be necessary to first have a good understanding of the complex nature of the socio-spatial changes occurring in Lithuania and the processes behind them. This thesis aims to contribute to this understanding.

The socio-spatial changes taking place in Lithuania have been my topic of research for the past eight years. Unfortunately, the more I studied Lithuania, the more I understood that the country was in a very difficult phase of socio-demographic and economic development. If no urgent steps are taken and no radical solutions implemented to systematically address the problems of population decline, I believe the negative trends will only increase. Eventually, this will have particularly severe demographic and economic consequences, such as rapidly aging population, labour shortage and rising public sector deficits. The results of this thesis will highlight some of the most problematic trends in socio-spatial development. The thesis will also illustrate the urgent need to start planning for population decline.

The issues facing Lithuania not only triggered my attention from a researcher's perspective, but also from the perspective of a citizen of the country. Like many Lithuanians, I chose to go abroad to extend my horizons, and I personally understand how difficult it is for many emigrants to make the decision to return to the country, the future of which is so uncertain. It seems that even the most basic vision of economic and socio-demographic development is lacking.

This thesis includes five chapters reporting on empirical research: four are published papers and one is a published chapter in a book. Another published paper is not included as a separate chapter, but some of its results are presented here in the introduction (Section 1.2.3). In the case of two papers included, I am not the first author; however, I significantly contributed to their writing and the analysis. These chapters focus on the segregation process and both were part of a research project in Lithuania in which I participated as one of the main contributors. I have included them in this thesis because they contribute to the overall aim of understanding socio-spatial change in Lithuania.

Some of the analyses presented in this thesis are descriptive in nature. However, considering that current knowledge about Lithuania is very limited, it is important to first fill in some knowledge gaps and enhance our understanding of more general processes. When I started my PhD, very limited data was available and it was only possible to use cross-sectional aggregated census data. As the PhD progressed, I was able to access more detailed individual-level census data. This thesis is the first study to use individual-level geo-coded Lithuanian census data for socio-spatial research. It is expected that the continuation of research in the future will open up opportunities for more enhanced studies and add more to the formation of theory.

Acknowledgements

When I moved to the Netherlands, following my husband, I could not have imagined that I will start doing PhD at the Delft University. I have begun as a guest researcher at the OTB and my goal was to write a couple of articles. Articles followed the articles... Eventually I was asked, whether I would like to turn them into the thesis. "Not much work is left" – I was told. It was a great opportunity that I could not miss. Of course, there was more work left than I have hoped for. As if that was not enough, I have involved myself into several research projects in Lithuania and Germany. As a result, the last one and a half years were really ambitious and challenging, but I cannot regret a single sleepless night.

I could not have succeeded to finish this thesis without the motivation, support and contribution of many others. I would particularly like to thank my supervisor Maarten van Ham. He is very inspiring researcher having incredible abilities to keep everybody motivated. Maarten was a great example and authority not only in science but in life throughout my PhD. Once he said that the supervision of my PhD is more of a hobby than a job for him. I accept it as a compliment. No less thankful I am to Donatas Burneika. Thanks to him I became a researcher. Donatas is my main co-author and a person I can ask for advice and help at any time. I hope that I will have an opportunity to work with both of these professors in the future.

I would like to thank the members of the doctoral committee. I am very grateful that all of them accepted our invitation to participate in my defence and had positive feedback about my work.

I am thankful for all the colleagues in the OTB, Lithuanian Social Research Centre and Leibniz Institute for Regional Geography, with whom I was working during the last years. I enjoyed being part of all these inspiring research environments, meeting many interesting people and learning from them. I am thankful for everyone who did not mind and were happy to have my dog Ufa in our shared offices. There is no better way to reduce work-related stress.

I am also very grateful to my beloved and supporting family. My parent's passion and habit to be proud of their three daughters encouraged me not to disappoint them and go down this PhD road till the end. My sisters will always be my best friends. No less important to me are my parents in law, their trust and enthusiasm.

I would not have achieved many things in my life without the encouragement and support of my husband. He is my biggest luck.

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Summary

1 Introduction

The fall of the Berlin Wall in 1989 signalled a major change for Central and Eastern European (CEE) countries. Despite the significant benefits gained with the 'return to Europe', CEE countries have also been faced with large challenges (Gentile, Tammaru, & van Kempen, 2012; Kornai, 2006; Kovács, 1999; Shleifer & Treisman, 2014). They had to transform their political and economic systems and find new ways to establish themselves in the context of increasing globalization, liberalization and technological progress. This has led to rapid and significant changes in their socio-spatial organization (Brade, Herfert, & Wiest, 2009; Gentile et al., 2012; Lang, 2011; Lang, Henn, Sgibnev, & Ehrlich, 2015; Schmidt, Fina, & Siedentop, 2015; Smith & Timár, 2010). According to Stanilov (2007), due to the very rapid pace of change, the recent socio-spatial developments in CEE countries can be seen as a perfect 'laboratory for observation'. The most significant development trends in the post-socialist countries are population decline and increasing spatial inequalities that started soon after the reforms. Of all the post-socialist countries, it is Lithuania that stands out the most, experiencing an extreme drop in population (Eurostat, 2017; United Nations, 2015). Since the 1990s, it has lost more than 20 percent of the population, which makes it one of the world's fastest shrinking countries. Furthermore, in Lithuania in the socialist period, planning policy focused on decentralisation and sought to limit the growth of the major cities (Enyedi, 1998; Šešelgis, 1996; Vanagas, Krišjane, Noorkoiv, & Staniūnas, 2002). Now most of the economic growth and demographic potential is concentrated in a few metropolitan regions, particularly in Vilnius (Burneika & Ubareviciene, 2015; Cirtautas, 2013; Krupickaitė, 2014; Ubarevičienė & Burneika, 2015; Ubarevičienė, Burneika, & Kriaučiūnas, 2011). Extreme population decline and uneven spatial development can be seen as a threat to the economic and social stability of Lithuania.

Despite the fact that significant socio-spatial transformations have been occurring for three decades in Lithuania, they have only recently started to attract greater attention. However, many issues related to socio-spatial development still receive little attention in the scientific and political domains. *The **aim** of this thesis is to gain more insight into the recent socio-spatial transformation processes and their consequences in Lithuania.* This thesis investigates the main features and drivers of socio-spatial change. It shows why we should be concerned, despite the growing economy and improvements in the standard of living, as Lithuania is facing major challenges related to extreme population decline and increasing socio-spatial inequality. The results of this study provide a better

understanding of the development processes and reveal how the Soviet-designed socio-spatial structures adapted to a market economy environment. This thesis contributes to the existing literature by investigating population decline, migration patterns, processes of segregation and increasing regional inequalities. While the focus is on Lithuania, the results of this study are also of value for other CEE countries, many of which have experienced similar trajectories of change during recent decades.

Historical background of Lithuania

For five decades, Lithuania and other CEE countries were under a communist regime subject to a command (planned) economic model, which was based on the principles of central planning (Borén & Gentile, 2007; Sjöberg, 1999). The countries were isolated from the rest of Europe, with the Iron Curtain - the symbol of the ideological conflict between communism and capitalism. The collapse of the Soviet Union is identified as one of the life-transforming moments in world history (Smith & Timár, 2010), while the radical reforms in post-communist countries that followed this collapse have been called 'shock therapy' (Leyk, 2016). Under the communist regime, the central government played a major role in directing the structure of the economy, as well as investment in and allocation of production in CEE countries (Samonis, 1995). After the breakdown of the Soviet Union, CEE countries shifted their economies away from central planning and adopted market economy principles (Smith & Rochovská, 2006). State intervention in the economy was reduced and the markets liberalised. Significant economic restructuring has started. The main changes were related to a switch from collective to private ownership and from the dominance of the primary and secondary sectors to the dominance of the tertiary sector. The most important economic factors became location, efficiency and profitability, which were almost non-existent criteria in the Soviet period. The CEE countries, including Lithuania, had to completely rebuild their economies.

The consequences of the breakdown of communism were especially significant for the Baltic States of Lithuania, Latvia and Estonia. Unlike other CEE countries, they were Republics of the Soviet Union in a 'self-enclosing' communist system. In this system, political, economic and social relations with other European countries were virtually non-existent, while, at the same time, there were no internal borders (either political or economic) between the Soviet Republics. Later, the Baltic States all successfully joined one of the most liberal and open economies in the world – the European Union. The Baltic States completely changed their status: from a relatively affluent and prosperous region in the Soviet Union they became the relatively poor periphery of a borderless European Union. In parallel, from being the receivers of large inflows of immigrants from the other Soviet Republics, they started to lose their populations, due to large-scale out-migration to Western countries.

Sharp population decline and increasing spatial inequalities in Lithuania are strongly linked with Soviet spatial planning principles (Clayton & Richardson, 1989; Demko & Regulska, 1987). During the socialist period planning policy in Lithuania favoured the organised distribution of the population and economic activities (Šešelgis, 1996; Vanagas et al., 2002). This meant that part of the potential growth of the largest cities was distributed to medium and small-sized cities, thereby creating a polycentric urban system. By the end of the socialist period, the urban system was more balanced in Lithuania than in any other CEE country (Aberg, 2005). After the demise of the Soviet Union residential mobility and the location of economic activity have no longer been centrally regulated. Due to the different locational priorities of the new economic sectors, as well as increased mobility opportunities for residents, the socio-spatial organisation of Lithuania started to change. Economic activities and population started to concentrate in the major-city regions, especially in Vilnius. At the same time, many regions whose growth had been stimulated during the Soviet period became unable to provide sufficient levels of employment and standards of living under the new competitive economic conditions. This meant uneven spatial development, with clearly visible trends of metropolisation and peripheralisation of people and economy, as well as increasing social inequalities (Cirtautas, 2013; Krupickaitė, 2003; Vanagas et al., 2002).

Socio-spatial developments

This thesis focuses on four areas of social-spatial change: population decline, shifting residential patterns, social segregation and increasing regional inequalities. These processes characterised Lithuania in the recent decades. Firstly, due to its exceptional geopolitical situation (the experience of a shift from the Soviet Union to the EU) and, secondly, due to the specific legacy of Soviet planning policy.

Population decline. Depopulation often begins with economic downturn and becomes part of a vicious circle, causing a downward spiral of the economy, declining tax revenues, a decline in service provision and social infrastructure, and increasing numbers of abandoned buildings (Elshof, van Wissen, & Mulder, 2014). Such self-reinforcing developments make the shrinking areas even less attractive to the people who are left behind and increase the probability that they will also leave. Myrdal (1957) has described this as 'circular cumulative causation'. This also reflects the development of population in Lithuania. The population of Lithuania started to decline soon after the 1990s: while in Soviet times there was an inflow of migrants from other Soviet Republics, after the 1990s, a large-scale out-migration to Western countries began. Now Lithuania is one of the 'leaders' in terms of population decline in the post-socialist region and the world overall. Since the 2000s, the country has been shrinking, on average, by -1.2 percent every year (Statistics Lithuania, 2017). Although depopulation affects almost the entire territory of Lithuania, there are great spatial variations in

population change throughout the country. An increasing concentration of population is observed in the major city-regions, albeit the population is dropping in the inner cities themselves. The most radical demographic changes take place in the peripheral countryside regions, which are losing population at the highest rates and experience significant changes in the demographic and socio-economic composition. Although, this is a spatial pattern common for all CEE countries, the unique legacy of the Soviet planning policy let us to expect more profound socio-spatial changes in Lithuania.

Changing residential patterns: the outcome of migration. Previous studies have shown that migration plays a major role in the processes of population redistribution and growing spatial imbalances (Ambinakudige & Parisi, 2015; Boyle, Halfacree, & Robinson, 1998; Martí-Henneberg, 2005; Ubarevičienė, 2016). Migration is a cause as well as the consequence of socio-spatial change. Migration is usually a response to labour market conditions, educational opportunities, family factors, or a desire to improve one's quality of life (Biagi, Faggian, & McCann, 2011; Niedomysl, 2011; Nivalainen, 2004). In the neoclassical view, labour migration should eventually lead to a spatial equilibrium (Sjaastad, 1962). Contrary to the neoclassical economic model, alternative migration theories assert that migration usually reinforces inequality rather than leading to its reduction (Abreu, 2010; Arango, 2000; Fratesi & Percoco, 2014). Therefore, the process of migration typically leads to growing regional disparities in terms of population distribution and economic performance, characterised by an increasing gap between the 'winning' and 'losing' regions. In Lithuania, during the Soviet period the growth of the largest cities was supressed, the development of the regional centres enhanced and rural-urban migration restricted. However, since the 1990s, residential mobility has no longer been centrally regulated and the mobility opportunities of residents have increased. People started to move from less urbanised to more urbanised areas, and from agricultural to industrial and service-led regions, resulting in metropolisation and peripheralisation of people and economy. In addition, suburbanisation of the residents from the major Lithuanian cities became one of the most significant features of socio-spatial development since the 1990s.

Social segregation. Starting with the Chicago School, numerous studies have been performed to gain more insight into the drivers and effects of segregation (Burgers & Musterd, 2002; Cassiers & Kesteloot, 2012; Scarpa, 2015; van Kempen & Murie, 2009). Scholars generally agree that the socio-spatial structure was more homogenous in socialist cities compared to Western capitalist cities and that the social segregation has started to increase in CEE cities since the early 1990s (Marcińczak et al., 2015; Sýkora, 1999; Szelényi, 2001; Tammaru, Marcińczak, van Ham, & Musterd, 2016; Tsenkova, 2006). Despite that, recent studies show that the levels of socioeconomic segregation in many CEE cities remain relatively low compared to the western counterparts, although the income inequality has grown considerably since the

demise of communism (Marcińczak et al., 2015; Tammaru, Marcińczak, et al., 2016). However, CEE countries might face a greater consequences of segregation in the near future, because they do not have a strong social housing sector, resources to deal with the housing problems or social mix policy (van Kempen & Murie, 2009). In addition, according to Cortese and colleagues (2014, p. 2053), 'social cohesion is even more difficult to achieve in shrinking cities than in other cities because … [they] are overburdened with challenges but left with few(er) resources at hand.' In Lithuania, studies that directly address social segregation and its spatial dimension have only recently started to appear. Earlier studies found that the levels of segregation were relatively low in Vilnius and the other large Lithuanian cities. However, they did not investigate how the levels of segregation have changed over time.

Increasing regional inequalities. During recent decades, socio-spatial inequalities have become increasingly apparent on the international, national, regional and local scales (Kühn, 2015). The interest in socio-spatial inequalities and the reason they develop has also increased considerably (Dawkins, 2003; Hudson, 2005). Most have concluded that a certain level of inequality is inevitable in a free market economy (Cassiers & Kesteloot, 2012; Dawkins, 2003; DeFilippis, 2017; Hudson, 2011; Smith & Timár, 2010). These inequalities involve economic, social, political and other dimensions and are usually produced by the processes of centralisation and peripheralisation. Furthermore, inequality seems to increase with economic growth and development (Kim, 2008). The metropolitan regions continue to grow demographically and economically, while many of the remaining regions face a downward spiral of decline. According to Kühn (2015), 'agglomeration provides a context to innovations, which in turn attracts more activities and reinforces the agglomeration'. Such agglomeration is to the disadvantage of non-metropolitan regions, which are increasingly left behind. It is believed that great spatial imbalances in the development of countries may threaten their social and economic stability (Ehrlich, Kriszan, & Lang, 2012; Hudson, 2015; Lang, 2011). In Lithuania, regional inequalities have constantly increased since the 1990s. While in Soviet times the uniform spread of the population and economic activity was advocated, now most of the economic growth and demographic potential are concentrated in a few metropolitan regions, particularly in Vilnius.

While this literature review describes the socio-spatial processes, which are typical to many CEE countries, little is known about how macro-level changes are affecting different spaces and groups in society in Lithuania. The aim of this thesis is thus to gain more insight into the recent socio-spatial transformation processes and their consequences in Lithuania.

Data challenges

Compared to other CEE countries, there has been relatively little research on the case of Lithuania. Until recently, doing socio-spatial research on Lithuania was a major challenge due to very limited data availability. This was also one of the challenges encountered when doing research for this thesis. At the start of this project, data availability was limited to cross-sectional census data from the years 2001 and 2011, aggregated on the municipality and ward level. As the project progressed, access to more detailed spatial level data (census tracts) and, eventually, also individual-level data for the whole population, was obtained. The access to individual-level data is one of the major achievements of this PhD project. This thesis is the first to use individual-level geo-coded Lithuanian census data in socio-spatial research. Access to this data made it possible to study processes of spatial mobility on a very small spatial scale as well as the interrelationships between individual characteristics. The individual-level data is an important research tool for Lithuania and it opens up new possibilities for future research. Although the data for the 2001 and 2011 censuses are not linked at the individual level, this might occur in the future, further widening research opportunities.

Empirical chapters

The dissertation includes five empirical chapters, with each chapter presenting different aspects of socio-spatial change and addressing specific research questions. Chapters 2 and 3 are focused on the country as a whole. These chapters analyse the geographical patterns of population decline and the role of selective migration on population redistribution and growing socio-spatial inequalities. Chapters 4, 5 and 6 are focused on the areas where the socio-spatial transformations have been the most intense – the metropolitan regions and, in particular, the Vilnius metropolitan region. These chapters contribute to the limited knowledge concerning the processes of ethnic and socioeconomic segregation in Lithuania. The empirical chapters are summarised below.

2 Shrinking regions in a shrinking country: The geography of population decline in Lithuania 2001-2011

This chapter serves as a starting point for the analyses of socio-spatial change in Lithuania. In this chapter, we seek to understand why some regions are losing more population than others. The main question raised in this chapter is: What are the underlying reasons for the observed geographical pattern of population decline in Lithuania? While in many countries research is focused on specific cities and regions (e.g.

Bontje, 2005; Cortese, Haase, Grossmann, & Ticha, 2014; McDonald, 2014; Wolff & Wiechmann, 2017), little is known about the spatial dimension of population decline on a national level and the local factors determining spatially uneven population change. In this chapter, we examine the geography of population decline within Lithuania and how this decline is affected by a combination of regional characteristics.

This study uses data from the 2001 and 2011 Lithuanian censuses, aggregated in small regions. Linear regression is used to model population change in the regions, including a detailed urban-rural classification and a range of sociodemographic and economic characteristics. The range of the population change varies a lot across Lithuania, with some areas almost doubling their population, while other areas lost close to half of their population between 2001 and 2011. The pattern of population change shows a concentration of population in the metropolitan areas and a sharp decline in peripheral rural regions. Our results show that an urban-rural distinction, city size and distance to cities are the most important factors in explaining regional variations in population change. In addition, these variations also depend on the percentage of working-age population, the percentage of high-ranking occupations, and the percentage of university-educated residents in the region. The regions where these percentages are small are shrinking the fastest. An interesting and unexpected finding was that the unemployment levels, as well as the levels of foreign investment, had no significant impact on population change. The results of this study give little hope to those who would like to develop policies to stop the decline outside metropolitan regions. It appears that the geographical location of the regions is a more important factor explaining population change than their demographic or socioeconomic composition. The insights into regional differences in population change and their drivers should contribute to the development of coping strategies and policies to deal with especially high population decline in Lithuania.

3 Population decline in Lithuania. Who lives in declining regions and who leaves?

Internal migration plays a major role in redistributing population and in growing spatial imbalance within countries (Ambinakudige & Parisi, 2015; Ubarevičienė, 2016). Given a context of extreme population decline and increasing regional inequalities in Lithuania, surprisingly little is known about the direction of migration flow within the country, as well as the demographic and socioeconomic composition of such flows. This chapter focuses on the rapidly declining regions in Lithuania. It can be expected that the population leaving declining regions is very selective and thus it results in residential differentiation throughout the country. This chapter addresses the following research questions: Who lives in the rapidly declining regions? Who are most likely to leave such regions?

This study is the first to use individual-level geo-coded data from the 2001 and 2011 Lithuanian censuses to analyse internal migration. The results of the regression models show that low socioeconomic status residents and older residents dominate the population in the rapidly declining regions. Unsurprisingly, younger and single individuals with higher levels of education are the most likely to leave these regions. Among the latter, younger and higher educated individuals are more inclined to move into the metropolitan areas than to non-metropolitan areas. At the same time, however, the most socially disadvantaged groups are more likely to migrate between the rapidly declining regions. Therefore, these regions have been hit in two ways, losing young, educated people, and gaining older, lower educated and unemployed residents. As a result, socio-spatial polarisation continues to grow within the country, with younger people of higher socioeconomic status increasingly overrepresented in the metropolitan areas, and the elderly and residents with a lower socioeconomic status overrepresented in declining rural regions. These findings suggest that this double-edged form of selective migration leads to a downward spiral of decline, which becomes a cumulative and self-reinforcing process, leading to further population decline. Although uneven spatial development is typical of many countries, in Lithuania it is accompanied by extreme rates of population decline. As a result, socio-spatial polarisation is more profound here than in many other countries. Moreover, other social consequences, such as segregation processes, can also be expected to be more profound in Lithuania.

4 Ethno-political effects of suburbanisation in the Vilnius urban region: An analysis of voting behaviour

Using the example of the Vilnius urban region this chapter illustrates how recent socio-spatial change is influenced by the historical and geographical context of Lithuania. Like many other formerly centrally planned cities in Europe, Vilnius is undergoing rapid suburbanisation, a process which started immediately after 1990 (Brade et al., 2009; Cirtautas, 2013; Ubarevičienė et al., 2011). Suburbanisation became a significant driver of a change in ethnic composition in the surrounding Vilnius region (Burneika & Ubarevičienė, 2011). This was caused by the flow of ethnic Lithuanians from the city of Vilnius into its surrounding region, which had been dominated by Polish-identity residents. This chapter explores the confrontation of two ethnic groups in the suburbs by studying their voting behaviour. The research question of this chapter is: What are the consequences of suburbanisation for voting behaviour in the surrounding Vilnius region?

In this study we use electoral data from the 1997 and 2011 municipality elections to gain insight into the ethno-political effects of suburbanisation in the Vilnius urban region.

The election results showed that the vast majority of Polish identity residents in the region surrounding Vilnius city support the Polish political party, and this region also stands out for the exceptionally high voting turnout. However, with the inflow of ethnic Lithuanians, the share of votes for the Polish party is decreasing. At the same time, we observed a stark increase in the absolute number of votes for the Polish party in the zone of suburbanisation. We also found an increase in voter turnout, especially in areas with a higher proportion of Polish-identity residents in the population. These aggregate level findings suggest that Poles are concerned about their representation in the municipal government. We conclude that the Polish-identity residents show increased voter turnout in an attempt to protect their weakening position in local politics. The continuing process of suburbanisation thus appears to pose a threat to the Polish political party's dominant position in the future.

5 Large social inequalities and low levels of socio-economic segregation in Vilnius

Chapter 5 takes a closer look at the socioeconomic segregation processes in Vilnius. This chapter is part of a larger comparative study, as reported in a book on socioeconomic segregation in European capital cities (Tammaru, Marcinczak, van Ham, & Musterd, 2016). The study showed that Vilnius is one of the least segregated European capital cities. On the other hand, according to the Gini index, the income gap in Lithuania has constantly been among the highest in the European Union in recent decades (Eurostat, 2017). This contrast attracts special attention to Vilnius, since typically socioeconomic inequality is followed by spatial inequality (van Ham, Tammaru, de Vuijst, & Zwiers, 2016). This chapter addresses the following research questions: How has the occupational structure of the population of Vilnius city changed between 2001 and 2011? Do we find evidence of increasing or decreasing levels of occupational segregation in the 2000s following the growth of social inequality since the 1990s? How do the segregation processes vary between the city zones?

Several measures of segregation were used to investigate (changing) patterns of segregation between 2001 and 2011 in Vilnius. Occupational groups were used as a proxy for socio-economic status. The index of segregation, which indicates how evenly occupational groups are distributed across the city, showed a low and stable level of segregation, with a minor trend towards growing inequality in the distribution of the middle and lower occupational groups. At the same time, the index of dissimilarity, which compares a distribution of two selected groups, showed an increase of spatial distance between lower and higher occupational groups. This trend was further confirmed by the index of isolation, which demonstrated sharply increasing isolation of the higher occupational groups, but decreasing isolation of the other groups. This is most likely a result of the residential mobility of more affluent households, which

concentrate in the most attractive inner and outer city locations. These findings were further supported by the location quotient maps, which showed the concentration of higher occupational groups in the inner city and the suburban zone. Results also showed that the historical divide between the relatively rich north and the poor south of the city is deepening. Socioeconomic segregation in Vilnius occurs when market forces work in conjunction with the weak welfare state and there is a limited supply of high-quality housing. Furthermore, the concurrent distribution of ethnic minorities allows us to speculate on the ethnic dimension of socioeconomic segregation.

6 Socio-ethnic segregation in the metropolitan areas of Lithuania

Ethnic and socioeconomic segregation are strongly linked in most cities (e.g. Clark & Blue, 2004; Tammaru, Kährik, Mägi, Novák, & Leetmaa, 2016). While most social segregation studies focus on capital cities, much less is known about second-tier cities. This final empirical chapter examines the interrelationships between ethnic and socioeconomic segregation in three metropolitan areas of Lithuania, formed by the cities of Vilnius, Kaunas and Klaipėda. These are the only macro-regional centres that still have the potential to retain population in the rapidly shrinking country. They are also the main destination points of internal migration in Lithuania. Moreover, their occupational structure has experienced a major shift during the last decades, with a sharp increase in high-status occupational groups. Therefore, we were interested in the effect of these changes on the patterns of socio-ethnic segregation in the metropolitan areas. The study investigates whether different ethnic groups (Lithuanians, Poles and Russians) might be associated with different socioeconomic statuses and how this relationship may have changed over ten years.

This study uses individual-level and census-tract level data from the 2001 and 2011 Lithuanian censuses. The results show a clear relationship between the socioeconomic and ethnic status of the residents and, therefore, suggest that ethnic segregation is strongly linked to the general processes of socioeconomic segregation. The findings showed that the higher the proportion of a certain ethnic minority group in a neighbourhood, the higher the proportion of lower socioeconomic status residents in this group. In addition, in such cases, ethnic minorities often tend to concentrate in less attractive neighbourhoods. The strength of the relationship between socioeconomic and ethnic status varied between the metropolitan areas. In Vilnius, increasing socioeconomic segregation had a clear ethnic element. This means that socioeconomic disparities between the ethnic groups are increasing. In contrast, socio-ethnic segregation is slowly diminishing in the second-tier metropolitan areas. Although socioeconomic inequalities are increasing in the latter, they were not associated with the ethnic dimension. While the levels of ethnic and socioeconomic segregation are low

in Lithuania in comparison to many other European cities, the increasing segregation is noticeable. Increasing socioeconomic segregation is especially evident in the multi-ethnic and most dynamically changing Vilnius metropolitan area, with ethnic minorities being found in increasingly disadvantaged socioeconomic positions.

7 Conclusions

This thesis set out to contribute to filling the current knowledge gaps concerning the recent socio-spatial transformation processes and their consequences in Lithuania. The thesis aimed to contribute answers to the following questions:

- What are the main features and drivers of socio-spatial change in post-socialist Lithuania?
- Why, despite the growing economy and improvements in the standard of living, Lithuania is facing major challenges related to extreme population decline and increasing socio-spatial inequalities?

Today, Lithuania has one of the fastest shrinking populations in the world. Since the 2000s, the average annual population decline has been -1.2 percent (Statistics Lithuania, 2017). As this thesis has shown, population decline, where the main factor is out-migration, has been accompanied by changing residential patterns and increasing socio-spatial inequalities throughout the country.

This thesis has highlighted some of the most problematic trends in socio-spatial development. Its main focus was on four interdependent areas of socio-spatial change: population decline, shifting residential patterns, processes of segregation and spatial inequalities. The thesis described the trajectories of the recent socio-spatial developments and examined why the scale and impact of the population change is exceptionally high in Lithuania. The thesis also showed how the Soviet-designed socio-spatial structures in Lithuania have adapted to the market economy environment.

As this thesis illustrated, uneven spatial development is obvious in Lithuania, with clearly visible trends of metropolisation and peripheralisation as well as increasing social inequalities. These processes not only involve the spatial redistribution of population, but also significant changes in the composition of the population, in both the population 'winning' and population 'losing' regions. Both types of regions are faced with major challenges and their residents are experiencing adverse, although different, consequences. Moreover, in Lithuania, increasing spatial inequalities are accompanied by extreme rates of population decline and, therefore, the socio-spatial consequences are more profound compared to many other countries.

The empirical research presented in this thesis showed that recent socio-spatial developments in Lithuania are still to a large extent determined by the legacy of Soviet planning policies, particularly those related to decentralised development strategies. Therefore, the current trend towards centralisation can be interpreted as an ongoing adaptation of a Soviet-constructed socio-spatial structure to one that is better suited to a capitalist system and a market-led economy.

In the context of extreme depopulation, metropolitan regions are facing different challenges. They are the only areas that still have the potential to grow. In this thesis, particular attention was paid to the processes of socioeconomic and ethnic segregation in the metropolitan regions. While the levels of segregation are low in Lithuanian cities in comparison to many other European cities, the levels of segregation are increasing. It is likely that the current trends will continue, leading to further segregation between the affluent and the poor. Increasing segregation is especially evident in the multi-ethnic Vilnius metropolitan region, with ethnic minorities found in increasingly disadvantaged socioeconomic positions. Furthermore, increasing segregation is often associated with social tensions. An example of the resulting ethno-political tensions in the surrounding Vilnius region was analysed in Chapter 4.

The results of this PhD thesis suggest that more planning is needed on all levels: the country, regions and neighbourhoods. Spatial planning policies – which are currently lacking – could play a major role in dealing with population decline and increasing socio-spatial inequalities. In contrast to popular belief, this thesis argues that population shrinkage is inevitable in Lithuania. It is very difficult to reverse this process and to prevent further out-migration. The challenge lies in maintaining a good balance between the needs of the residents and the financial capacity of the state. In each case, it might make most sense to plan for further population concentration in Lithuanian cities. In declining areas, the most efficient strategy would be to accept decline and concentrate services in accessible regional centres.

Directions for further research

The results of this thesis showed that it is important to put more emphasis on the socio-spatially unbalanced development of Lithuania. Socio-spatial inequalities are widening on different spatial scales: in the country as a whole, between and within the regions, and between and within cities. The processes of residential differentiation and segregation and their effects on different spaces and groups in society need further investigation. It is important to gain more knowledge of these processes in order to implement spatial planning policies that aim at reducing the adverse consequences of population decline and spatially unbalanced territorial development.

More attention needs to be paid to both the declining regions and the metropolitan areas. There is increasing concern about the erosion of human and economic resources in the rapidly declining regions, covering almost half of the country's territory. It is a major challenge to ensure the standard of living in these regions remains sufficiently high, but at the same time affordable. Further research should be directed to these areas to investigate the living conditions and needs of the residents. Although the results of this thesis have already provided insights into selective migration, questions such as why people move to declining areas and who they are, need further research. Metropolitan areas are faced with different challenges – high levels of social inequality and increasing levels of segregation. Although our results show that the current levels of segregation are relatively low, there is a serious risk of segregation increasing in the near future, especially in Vilnius. Further research and policy interventions are needed to prevent increasing social tensions.

Finally, Lithuania would benefit from comparative international studies on the Baltic States, which share a similar historical and geographical context. Greater cooperation between the Baltic States in creating regional policies, in particular those related to their shrinking cities and regions, is anticipated. Moreover, it can be expected that other countries and regions can learn from the extreme population decline in Lithuania. It is rather phenomenal that while the economy of the country is steadily growing and the standard of living is improving, the population is declining and this trend seems to be accelerating.

Samenvatting

1 Inleiding

De val van de Berlijnse Muur in 1989 betekende het begin van een grote verandering voor de landen van Midden- en Oost-Europa (MOE). Hoewel de 'terugkeer naar Europa' belangrijke voordelen heeft opgeleverd voor de MOE-landen, werden ze ook voor grote uitdagingen gesteld (Gentile, Tammaru & van Kempen, 2012; Kornai, 2006; Kovács, 1999; Shleifer & Treisman, 2014). Ze moesten hun politieke en economische stelsels hervormen en nieuwe wegen vinden om zich een plaats te verwerven te midden van toenemende globalisering, liberalisering en technologische vooruitgang. Hierdoor zijn er snelle en belangrijke veranderingen opgetreden in hun sociaal-ruimtelijke structuur (Brade, Herfert & Wiest, 2009; Gentile et al., 2012; Lang, 2011; Lang, Henn, Sgibnev & Ehrlich, 2015; Schmidt, Fina & Siedentop, 2015; Smith & Timár, 2010). De recente sociaal-ruimtelijke ontwikkelingen in MOE gaan zo snel dat de landen volgens Stanilov (2007) als perfect 'observatielaboratorium' kunnen worden beschouwd. De belangrijkste ontwikkelingstrends in de postsocialistische landen zijn bevolkingsafname en een toenemende ruimtelijke ongelijkheid. Beide trends zijn spoedig na het begin van de hervormingen begonnen. Van alle postsocialistische landen springt Litouwen er het meest uit: in dit land is de bevolking zeer sterk afgenomen (Eurostat, 2017; United Nations, 2015). Sinds de jaren 1990 bedraagt de afname van de bevolking meer dan 20 procent, waarmee het een van de snelst krimpende landen ter wereld is. Bovendien was het ruimtelijk beleid in Litouwen in de socialistische periode gericht op decentralisatie en probeerde men de groei van de grote steden te beperken (Enyedi, 1998; Šešelgis, 1996; Vanagas, Krišjane, Noorkoiv & Staniūnas, 2002). Tegenwoordig is de economische groei en het demografisch potentieel geconcentreerd in enkele grootstedelijke regio's, en vooral in Vilnius (Burneika & Ubareviciene, 2015; Cirtautas, 2013; Krupickaitė, 2014; Ubarevičienė & Burneika, 2015; Ubarevičienė, Burneika & Kriaučiūnas, 2011). De extreme bevolkingsafname en de ongelijkmatige ruimtelijke ontwikkeling kunnen worden beschouwd als een bedreiging voor de economische en maatschappelijke stabiliteit van Litouwen.

Hoewel belangrijke sociaal-ruimtelijke transformaties in Litouwen al dertig jaar aan de gang zijn, wordt er nog maar sinds kort meer aandacht aan besteed. Veel kwesties op het gebied van sociaal-ruimtelijke ontwikkeling krijgen echter nog steeds weinig aandacht in wetenschap en politiek. *Het **doel** van dit proefschrift is om meer inzicht te krijgen in de recente sociaal-ruimtelijke transformatieprocessen en de gevolgen daarvan in Litouwen.* In dit proefschrift onderzoeken we de belangrijkste kenmerken

en oorzaken van sociaal-ruimtelijke verandering. Het proefschrift laat zien waarom we ons ondanks de economische groei en de hogere levensstandaard zorgen moeten maken omdat Litouwen te maken heeft met grote uitdagingen als gevolg van de extreme bevolkingsafname en de toenemende sociaal-ruimtelijke ongelijkheid. Deze studie biedt inzicht in de ontwikkelingsprocessen en laat zien hoe de in de Sovjet-Unie ontworpen sociaal-ruimtelijke structuren zich hebben aangepast aan de markteconomie. Met onderzoek naar de bevolkingsafname, migratiepatronen, segregatieprocessen en toenemende regionale ongelijkheid draagt het proefschrift bij aan de bestaande literatuur. De focus ligt op Litouwen, maar de resultaten van het onderzoek zijn ook relevant voor andere MOE-landen, die in de afgelopen decennia veelal vergelijkbare veranderingstrajecten hebben doorgemaakt.

Historische achtergrond van Litouwen

Litouwen en andere MOE-landen zijn vijf decennia lang communistisch bestuurd, met een planeconomie gebaseerd op de principes van centrale planning (Borén & Gentile, 2007; Sjöberg, 1999). De landen waren van de rest van Europa afgescheiden door het IJzeren Gordijn, symbool van het ideologische conflict tussen communisme en kapitalisme. De ineenstorting van de Sovjet-Unie wordt gezien als een cruciaal moment in de wereldgeschiedenis (Smith & Timár, 2010), en de hierop volgende radicale hervormingen in postcommunistische landen zijn wel aangeduid als 'shocktherapie' (Leyk, 2016). Onder het communistische regime speelde de centrale regering in MOE-landen een belangrijke rol bij het beheer van de economische structuur, bij investeringen in productiemiddelen en de toewijzing ervan (Samonis, 1995). Na het uiteenvallen van de Sovjet-Unie hebben de MOE-landen hun centraal geplande economieën vervangen door de principes van de markteconomie (Smith & Rochovská, 2006). De staat bemoeide zich minder met de economie en de markten werden geliberaliseerd. Er vond een grote economische herstructurering plaats. De belangrijkste veranderingen betroffen de omschakeling van collectief naar particulier eigendom en van dominantie van de primaire en secundaire sector naar dominantie van de tertiaire sector. De belangrijkste economische factoren werden locatie, efficiëntie en winstgevendheid, criteria die in de Sovjetperiode bijna geen rol speelden. De MOE-landen, en dus ook Litouwen, moesten hun economie van de grond af opbouwen.

De consequenties van de val van het communisme waren vooral drastisch in de Baltische staten Litouwen, Letland en Estland. Anders dan andere MOE-landen waren dit Sovjetrepublieken, die zich in een 'autonoom' communistisch systeem bevonden. In dit systeem was nauwelijks plaats voor politieke, economische en maatschappelijke relaties met andere Europese landen, terwijl er tussen de Sovjetrepublieken geen politieke of economische grenzen bestonden. Later sloten de Baltische staten zich alle drie aan bij een van de meest liberale en open economieën ter wereld: de

Europese Unie. De Baltische staten kregen een totaal andere status: van een relatief welvarende regio in de Sovjet-Unie veranderden ze in de relatief arme periferie van een Europese Unie zonder grenzen. En terwijl ze vroeger als onderdeel van de Sovjet-Unie veel immigranten uit de andere Sovjetrepublieken opnamen, nam de bevolking nu af door grootschalige emigratie naar westelijke landen.

De scherpe bevolkingsafname en de toenemende ruimtelijke ongelijkheid in Litouwen houden in grote mate verband met de principes van ruimtelijke ordening zoals die in de Sovjet-Unie werden gehanteerd (Clayton & Richardson, 1989; Demko & Regulska, 1987). In het planbeleid van het socialistische tijdperk in Litouwen was sprake van een georganiseerde verdeling van de bevolking en de economische activiteiten (Šešelgis, 1996; Vanagas et al., 2002). Dit betekende dat een deel van de potentiële groei van de grootste steden werd gedistribueerd naar middelgrote en kleine steden, zodat er een polycentrisch stedelijk stelsel ontstond. Aan het eind van de socialistische periode was dit stedelijk stelsel in Litouwen meer gebalanceerd dan in enig ander MOE-land (Aberg, 2005). Na de opheffing van de Sovjet-Unie werden de woonmobiliteit en de locaties van economische activiteit niet meer centraal gereguleerd. Door de verschillende locatieprioriteiten van de nieuwe economische sectoren en de grotere mobiliteit van de bevolking begon de sociaal-ruimtelijke organisatie van Litouwen te veranderen. Economische activiteiten gingen zich concentreren in en bij de grote steden, vooral Vilnius, en de bevolking verhuisde mee. Tegelijkertijd konden veel regio's waarvan de groei tijdens de Sovjetperiode was gestimuleerd, in de nieuwe economische omstandigheden niet meer genoeg werkgelegenheid bieden en ging de levensstandaard in deze gebieden achteruit. De ruimtelijke ontwikkeling werd dus ongelijker: er kwamen duidelijk zichtbare trends van metropoolvorming en periferalisatie en de maatschappelijke ongelijkheid werd groter (Cirtautas, 2013; Krupickaitė, 2003; Vanagas et al., 2002).

Sociaal-ruimtelijke ontwikkelingen

Dit proefschrift behandelt vier gebieden van sociaal-ruimtelijke verandering: bevolkingsafname, verschuivende woonpatronen, maatschappelijke segregatie en toenemende regionale ongelijkheid. Deze processen speelden de afgelopen decennia een grote rol in Litouwen, ten eerste door de uitzonderlijke geopolitieke situatie (van Sovjet-Unie naar EU) en ten tweede door de specifieke erfenis van het planbeleid van de Sovjetperiode.

Bevolkingsafname. Ontvolking begint vaak met economische neergang en wordt dan deel van een vicieuze cirkel. Het resultaat is dat de economie in een neerwaartse spiraal terechtkomt, belastinginkomsten dalen, dienstverlening en maatschappelijke infrastructuur verslechteren en er steeds meer gebouwen leeg komen te staan (Elshof,

Van Wissen & Mulder, 2014). Dergelijke ontwikkelingen versterken zichzelf en maken de krimpgebieden nog minder aantrekkelijk voor de mensen die achterblijven, zodat de kans groter wordt dat ook zij vertrekken. Myrdal (1957) noemt dit 'circulaire cumulatieve causatie'. Ook bij de bevolking van Litouwen is deze ontwikkeling te zien. De bevolking van Litouwen begon spoedig na de jaren negentig af te nemen: terwijl het land in de Sovjettijd veel immigranten uit de andere Sovjetrepublieken opnam, begon er nu een grootschalige emigratie naar westelijke landen. Nu is Litouwen een van de landen waar de bevolking het sterkst afneemt, zowel binnen de postsocialistische regio als wereldwijd. Sinds het begin van deze eeuw krimpt de bevolking gemiddeld met 1,2 procent per jaar (Statistics Lithuania, 2017). Hoewel de ontvolking in bijna heel Litouwen aan de gang is, is er grote ruimtelijke variatie in het bevolkingsverloop. De bevolking raakt steeds meer geconcentreerd in en bij de grote steden, al neemt zij in de binnensteden wel af. De meest drastische demografische veranderingen vinden plaats in de perifere plattelandsgebieden, waar de bevolking het snelst afneemt en er belangrijke veranderingen optreden in de demografische en sociaal-economische samenstelling. Hoewel dit ruimtelijke patroon in heel MOE te zien is, verwachten we in Litouwen door de unieke erfenis van het planbeleid van de Sovjetperiode ingrijpender sociaal-ruimtelijke veranderingen dan in andere MOE-landen.

Veranderende woonpatronen: het resultaat van migratie. Uit eerder onderzoek is gebleken dat migratie een grote rol speelt in de herverdeling van de bevolking en de toenemende ruimtelijke ongelijkheid (Ambinakudige & Parisi, 2015; Boyle, Halfacree & Robinson, 1998; Martí-Henneberg, 2005; Ubarevičienė, 2016). Migratie is zowel oorzaak als gevolg van sociaal-ruimtelijke verandering. Migratie is vaak een reactie op ontwikkelingen in de arbeidsmarkt, onderwijsmogelijkheden, gezinsfactoren of het verlangen naar een hogere levensstandaard (Biagi, Faggian & McCann, 2011; Niedomysl, 2011; Nivalainen, 2004). Volgens het neoklassieke economische model zou arbeidsmigratie uiteindelijk moeten leiden tot een ruimtelijk evenwicht (Sjaastad, 1962). Andere migratietheorieën stellen echter dat migratie ongelijkheid meestal versterkt in plaats van vermindert (Abreu, 2010; Arango, 2000; Fratesi & Percoco, 2014). Het migratieproces leidt meestal tot toenemende regionale ongelijkheid op het vlak van bevolkingsverdeling en economische resultaten, met een steeds grotere kloof tussen de regio's die 'winnen' en 'verliezen'. In Litouwen werd in de Sovjetperiode de groei van de grootste steden onderdrukt, de ontwikkeling van regionale centra gestimuleerd en de migratie van platteland naar stad beperkt. Sinds de jaren negentig wordt de woonmobiliteit niet meer centraal gereguleerd en zijn de bewoners mobieler geworden. Mensen begonnen te verhuizen van minder naar meer verstedelijkte gebieden en van landbouwregio's naar gebieden waar industrie en dienstverlening het belangrijkst zijn; er vond metropoolvorming en periferalisatie plaats. Daarnaast werd in de grote Litouwse steden suburbanisatie een van de belangrijkste verschijnselen in de sociaal-ruimtelijke ontwikkeling sinds de jaren negentig.

Sociale segregatie. Er zijn talrijke onderzoeken gedaan, om te beginnen vanuit de Chicago School, naar de oorzaken en gevolgen van segregatie (Burgers & Musterd, 2002; Cassiers & Kesteloot, 2012; Scarpa, 2015; van Kempen & Murie, 2009). Onder wetenschappers heerst consensus dat de sociaal-ruimtelijke structuur in socialistische steden homogener was dan in westerse kapitalistische steden en dat de maatschappelijke segregatie in steden in MOE is toegenomen sinds het begin van de jaren negentig (Marcińczak et al., 2015; Sýkora, 1999; Szelényi, 2001; Tammaru, Marcińczak, Van Ham & Musterd, 2016; Tsenkova, 2006). Uit recent onderzoek is echter gebleken dat de sociaal-economische segregatie in veel MOE-steden nog steeds geringer is dan in westerse steden, hoewel sinds de val van het communisme de inkomensongelijkheid aanzienlijk is toegenomen (Marcińczak et al., 2015; Tammaru, Marcińczak, et al., 2016). In de nabije toekomst kunnen de gevolgen van de segregatie voor MOE-landen echter ernstiger worden, omdat er geen sterke sector van sociale huisvesting bestaat, en er geen middelen zijn om huisvestingsproblemen op te lossen of een beleid van maatschappelijke vermenging door te voeren (van Kempen & Murie, 2009). Volgens Cortese en zijn collega's (2014, p. 2053), 'is maatschappelijke cohesie nog moeilijker te bereiken in krimpende steden dan in andere steden omdat [...] ze overbelast zijn door problemen maar minder middelen hebben om deze aan te pakken.' In Litouwen zelf doet men pas sinds kort direct onderzoek naar maatschappelijke segregatie en de ruimtelijke dimensie daarvan. Uit eerder onderzoek is gebleken dat er in Vilnius en de andere grote Litouwse steden relatief weinig segregatie was. Hierbij werd echter niet onderzocht hoe het segregatieniveau in de loop van de tijd is veranderd.

Toenemende regionale ongelijkheid. De afgelopen decennia is de sociaal-ruimtelijke ongelijkheid steeds zichtbaarder geworden op internationaal, nationaal, regionaal en lokaal niveau (Kühn, 2015). De belangstelling voor sociaal-ruimtelijke ongelijkheid en de oorzaken daarvan is ook aanmerkelijk toegenomen (Dawkins, 2003; Hudson, 2005). De conclusie is meestal dat een zekere mate van ongelijkheid in een vrijemarkteconomie onvermijdelijk is (Cassiers & Kesteloot, 2012; Dawkins, 2003; DeFilippis, 2017; Hudson, 2011; Smith & Timár, 2010). Deze ongelijkheid heeft economische, maatschappelijke, politieke en andere dimensies en ontstaat meestal door de processen van centralisatie en periferalisatie. Bovendien lijkt ongelijkheid toe te nemen met economische groei en ontwikkeling (Kim, 2008). De grootstedelijke regio's blijven demografisch en economisch groeien, terwijl veel van de andere regio's in een neerwaartse spiraal terechtkomen. Volgens Kühn (2015) 'biedt agglomeratie een context voor vernieuwingen, waardoor weer meer activiteiten worden aangetrokken en de agglomeratie wordt versterkt'. Een dergelijke agglomeratie is nadelig voor de niet-grootstedelijke regio's, die steeds verder achterblijven. Aangenomen wordt dat ruimtelijke ongelijkheid in de ontwikkeling van landen de maatschappelijke en economische stabiliteit kan bedreigen (Ehrlich, Kriszan & Lang, 2012; Hudson,

2015; Lang, 2011). In Litouwen is de regionale ongelijkheid sinds de jaren negentig voortdurend toegenomen. Terwijl er in de Sovjetperiode een uniforme spreiding van de bevolking en de economische activiteit werd nagestreefd, is de meeste economische groei en het grootste demografische potentieel nu in enkele grootstedelijke regio's geconcentreerd, met name in Vilnius.

Dit literatuuronderzoek betreft de sociaal-ruimtelijke processen die kenmerkend zijn voor veel MOE-landen, maar er is weinig bekend over de invloed van veranderingen op macroniveau op ruimten en groepen in de Litouwse maatschappij. Het doel van dit proefschrift is dus om meer inzicht te krijgen in de recente sociaal-ruimtelijke transformatieprocessen en hun gevolgen in Litouwen.

Gegevens

Vergeleken met andere MOE-landen is er op dit punt weinig onderzoek gedaan over Litouwen. Tot voor kort was sociaal-ruimtelijk onderzoek over Litouwen moeilijk omdat er erg weinig gegevens beschikbaar waren. Dat was ook een uitdaging bij dit dissertatieonderzoek. Bij het begin van dit project waren er alleen transversale censusgegevens uit de jaren 2001 en 2011 beschikbaar, geaggregeerd op gemeente- en wijkniveau. Later kregen we toegang tot meer gedetailleerde gegevens op ruimtelijk niveau (censusgebieden) en uiteindelijk ook op individueel niveau voor de hele bevolking. De toegang tot gegevens op individueel niveau is een van de belangrijkste resultaten van dit promotieproject. In dit proefschrift worden voor het eerst geo-gecodeerde Litouwse censusgegevens op individueel niveau gebruikt in sociaal-ruimtelijk onderzoek. Doordat we over deze gegevens beschikten, konden we processen van ruimtelijke mobiliteit op zeer kleine ruimtelijke schaal bestuderen, en ook de relaties tussen individuele kenmerken. De gegevens op individueel niveau vormen een belangrijke onderzoeksbron voor Litouwen en openen nieuwe mogelijkheden voor toekomstig onderzoek. De censusgegevens van 2001 en 2011 zijn niet op individueel niveau gekoppeld. Wellicht kan dat in de toekomst wel; daarmee zouden de mogelijkheden voor onderzoek nog breder worden.

Empirische hoofdstukken

Het proefschrift bevat vijf empirische hoofdstukken. In elk hoofdstuk worden verschillende aspecten van sociaal-ruimtelijke verandering gepresenteerd en worden specifieke onderzoeksvragen gesteld. De hoofdstukken 2 en 3 gaan over het land als geheel. Hierin worden de geografische patronen van de bevolkingsafname en de invloed van selectieve migratie op bevolkingsherverdeling en toenemende sociaal-ruimtelijke ongelijkheid geanalyseerd. De hoofdstukken 4, 5 en 6 gaan over de gebieden waar de sociaal-ruimtelijke transformaties het ingrijpendst zijn:

de grootstedelijke regio's en met name die van Vilnius. Deze hoofdstukken dragen bij aan de beperkte kennis over de processen van etnische en sociaal-economische segregatie in Litouwen. De empirische hoofdstukken worden hieronder samengevat.

2 Krimpende regio's in een krimpend land: de geografie van de bevolkingsafname in Litouwen, 2001-2011

Dit hoofdstuk fungeert als startpunt voor de analyse van sociaal-ruimtelijke verandering in Litouwen. We proberen te begrijpen waarom in sommige regio's de bevolking harder achteruitgaat dan in andere. De belangrijkste vraag van dit hoofdstuk is: Wat zijn de onderliggende redenen voor het waargenomen geografische patroon van bevolkingsafname in Litouwen? Bij veel landen betreft het onderzoek vooral specifieke steden en regio's (bijv. Bontje, 2005; Cortese, Haase, Grossmann & Ticha, 2014; McDonald, 2014; Wolff & Wiechmann, 2017), en is er weinig bekend over de ruimtelijke dimensie van bevolkingsafname op nationaal niveau en over lokale factoren die een rol spelen bij ruimtelijk ongelijke veranderingen in de bevolking. In dit hoofdstuk onderzoeken we de geografie van de bevolkingsafname in Litouwen en hoe deze afname wordt beïnvloed door een combinatie van regionale kenmerken.

We gebruiken gegevens van de Litouwse volkstellingen van 2001 en 2011, geaggregeerd in kleine regio's. Met behulp van lineaire regressie wordt de bevolkingsverandering in de regio's gemodelleerd, inclusief een gedetailleerde classificatie voor stad en platteland en een aantal sociaal-demografische en economische kenmerken. De mate van bevolkingsverandering varieert sterk binnen Litouwen. In sommige gebieden is de bevolking tussen 2001 en 2011 bijna verdubbeld, in andere bijna gehalveerd. Het patroon van bevolkingsverandering laat zien dat de bevolking meer in de grootstedelijke gebieden geconcentreerd raakt en sterk afneemt in perifere plattelandsregio's. Uit onze resultaten blijkt dat het onderscheid stad/platteland, de grootte van een stad en de afstand tot steden de belangrijkste verklarende factoren zijn voor regionale variaties in bevolkingsverandering. Verder worden de variaties ook bepaald door het percentage beroepsbevolking, het percentage goedbetaalde beroepen en het percentage bewoners met een universitaire opleiding in een regio. De regio's waar deze percentages klein zijn, krimpen het snelst. Een interessante en onverwachte constatering was dat het werkloosheidsniveau en het niveau van buitenlandse investeringen geen significante invloed hadden op bevolkingsverandering. De resultaten van dit onderzoek bieden weinig hoop voor mensen die beleid willen ontwikkelen om de afname buiten de grootstedelijke regio's te stoppen. De geografische locatie van een regio is een belangrijkere factor voor bevolkingsverandering dan de demografische of sociaal-economische samenstelling van de bevolking. De inzichten in regionale verschillen

in de bevolkingsverandering en de oorzaken daarvan kunnen bijdragen aan de ontwikkeling van strategieën en beleid met betrekking tot de sterke bevolkingsafname in Litouwen.

3 Bevolkingsafname in Litouwen. Wie woont in krimpende regio's en wie vertrekt?

Binnenlandse migratie speelt een grote rol bij de herverdeling van de bevolking en bij de toenemende ruimtelijke ongelijkheid in een land (Ambinakudige & Parisi, 2015; Ubarevičienė, 2016). In de context van extreme bevolkingsafname en toenemende regionale ongelijkheid in Litouwen is er verrassend weinig bekend over de richting van de migratiestromen in het land, en over de demografische en sociaal-economische samenstelling van die stromen. Dit hoofdstuk gaat over de snel krimpende regio's in Litouwen. Het is te verwachten dat de mensen die wegtrekken uit krimpende regio's heel selectief zijn, met als gevolg differentiatie in woonpatronen voor het hele land. In dit hoofdstuk komende de volgende onderzoeksvragen aan de orde: Welke mensen wonen in snel krimpende regio's? Welke mensen zijn het meest geneigd uit dergelijke regio's weg te trekken?

Dit onderzoek is het eerste waarin geo-gecodeerde Litouwse censusgegevens op individueel niveau uit 2001 en 2011 worden gebruikt om binnenlandse migratie te analyseren. De resultaten van de regressiemodellen laten zien dat de bevolking in de snel krimpende regio's wordt gedomineerd door bewoners met een lage sociaal-economische status en oudere bewoners. Het is geen verrassing dat jongeren, alleenstaanden en hoogopgeleiden het meest geneigd zijn uit deze regio's weg te trekken. Jongeren en hoogopgeleiden verhuizen vooral naar grootstedelijke gebieden. De sociaal meest achtergestelde groepen zijn daarentegen meer geneigd van de ene naar de andere snel krimpende regio te verhuizen. Dit betekent dat deze regio's op twee manieren worden getroffen: ze raken jongeren en hogeropgeleiden kwijt en krijgen aanwas van ouderen, lageropgeleiden en werklozen. Hierdoor blijft de sociaal-ruimtelijke polarisatie in het land groeien: jongeren met een hogere sociaal-economische status zijn steeds meer oververtegenwoordigd in de grootstedelijke gebieden, en ouderen en mensen met een lagere sociaal-economische status zijn steeds meer oververtegenwoordigd in krimpende plattelandsregio's. Deze bevindingen wijzen erop dat deze tweeledige vorm van selectieve migratie tot een neerwaartse spiraal leidt, een cumulatief proces dat zichzelf versterkt en tot verdere bevolkingsafname leidt. Veel landen hebben te maken met ongelijke ruimtelijk ontwikkeling, maar in Litouwen gaat dit gepaard met extreme bevolkingsafnamecijfers. Daardoor is de sociaal-ruimtelijke polarisatie hier ingrijpender dan in veel andere landen. Ook van andere maatschappelijke gevolgen, zoals segregatie, kan worden verwacht dat ze in Litouwen ingrijpender zijn dan elders.

4 Etnisch-politieke effecten van suburbanisatie in de stedelijke regio Vilnius: Een analyse van het stemgedrag

Aan de hand van het voorbeeld van de stedelijke regio Vilnius illustreert dit hoofdstuk hoe de recente sociaal-ruimtelijke verandering is beïnvloed door de historische en geografische context van Litouwen. Net als in veel andere Europese steden die vroeger centraal werden gepland, vindt in Vilnius een snelle suburbanisatie plaats, een proces dat meteen na 1990 begon (Brade et al., 2009; Cirtautas, 2013; Ubarevičienė et al., 2011). Suburbanisatie werd een belangrijke oorzaak van de verandering in etnische samenstelling in de regio rond Vilnius (Burneika & Ubarevičienė, 2011). Dit kwam doordat etnische Litouwers uit de stad Vilnius verhuisden naar de omliggende regio, die voorheen werd gedomineerd door Poolse inwoners. In dit hoofdstuk worden de twee etnische groepen in de voorsteden tegenover elkaar geplaatst door hun stemgedrag te bestuderen. De onderzoeksvraag van dit hoofdstuk is: Wat zijn de gevolgen van de suburbanisatie voor het stemgedrag in de regio rondom Vilnius?

We gebruiken in dit onderzoek gegevens van de gemeenteraadsverkiezingen van 1997 en 2011 om inzicht te krijgen in de etnisch-politieke effecten van suburbanisatie in de stedelijke regio Vilnius. Uit de verkiezingsresultaten blijkt dat een grote meerderheid van de Poolse inwoners van de regio rondom de stad Vilnius de Poolse politieke partij steunt. Deze regio valt daarnaast op door een uitzonderlijk hoge opkomst bij de verkiezingen. Met de instroom van etnische Litouwers neemt het percentage stemmen op de Poolse partij af. Tegelijkertijd constateerden we een sterke stijging in het absolute aantal stemmen op de Poolse partij in de suburbanisatiezone. De opkomst bleek hoger te zijn geworden, vooral in gebieden met een groter aandeel Poolse bewoners. De geaggregeerde aantallen wijzen erop dat Polen zich zorgen maken over hun vertegenwoordiging in het gemeentebestuur. We concluderen dat de Poolse inwoners hoger opkomen bij de verkiezingen omdat ze hun zwakker wordende positie in de lokale politiek willen versterken. Het voortdurende proces van suburbanisatie blijkt dus een bedreiging voor de dominante positie van de Poolse politieke partij.

5 Grote sociale ongelijkheid en geringe sociaal-economische segregatie in Vilnius

In hoofdstuk 5 kijken we naar de sociaal-economische segregatie in Vilnius. Dit hoofdstuk maakt deel uit van een groter vergelijkend onderzoek, waarvan verslag is gedaan in een boek over sociaal-economische segregatie in Europese hoofdsteden (Tammaru, Marcinczak, Van Ham & Musterd, 2016). Uit dit onderzoek bleek dat Vilnius een van de minst gesegregeerde Europese hoofdsteden is. Anderzijds was in de afgelopen decennia de inkomensongelijkheid in Litouwen volgens de Gini-index steeds een van de hoogste in de Europese Unie (Eurostat, 2017). Dit contrast

geeft aanleiding om speciale aandacht te besteden aan Vilnius, omdat sociaal-economische ongelijkheid vaak gevolgd wordt door ruimtelijke ongelijkheid (Van Ham, Tammaru, De Vuijst & Zwiers, 2016). In dit hoofdstuk komende de volgende onderzoeksvragen aan de orde: Hoe is de beroepsstructuur van de bevolking van de stad Vilnius veranderd tussen 2001 en 2011? Vinden we bewijs voor toenemende of afnemende beroepssegregatie in het eerste decennium van deze eeuw na de groei van de sociale ongelijkheid sinds het laatste decennium van de vorige eeuw? Hoe wijken de segregatieprocessen in de verschillende stadszones van elkaar af?

We hebben diverse maten voor segregatie gebruikt om de (veranderende) segregatiepatronen tussen 2001 en 2011 in Vilnius te onderzoeken. We hebben beroepsgroepen gebruikt als indicator van sociaal-economische status. De segregatie-index, een maat voor de gelijkmatigheid van de verdeling van beroepsgroepen over de stad, vertoonde een laag en stabiel niveau van segregatie, met een lichte trend richting meer ongelijkheid in de verdeling van de midden- en lagere groepen. Tegelijkertijd wees de ongelijkheidsindex, waarin de verdeling van twee geselecteerde groepen wordt vergeleken, op een toename van de ruimtelijke afstand tussen lagere en hogere beroepsgroepen. Deze trend werd bevestigd door de isolatie-index, die een scherp toenemende isolatie van de hogere beroepsgroepen liet zien, en een afnemende isolatie van de andere groepen. Waarschijnlijk wordt dit veroorzaakt door de woonmobiliteit van de rijkere huishoudens, die zich concentreren in de aantrekkelijkste locaties in de binnenstad en de buitenwijken. Deze bevindingen werden ondersteund door de locatiequotiëntkaarten, die ook een concentratie van hogere beroepsgroepen in de binnenstad en de suburbane zone lieten zien. Uit de resultaten bleek verder dat de historische kloof tussen het relatief rijke noorden en het arme zuiden van de stad dieper wordt. Sociaal-economische segregatie treedt in Vilnius op door een combinatie van marktwerking en een zwakke verzorgingsstaat. Ook is er een beperkte beschikbaarheid van huisvesting van hoge kwaliteit. De verdeling van etnische minderheden volgt een vergelijkbaar patroon, zodat we kunnen speculeren over de etnische dimensie van sociaal-economische segregatie.

6 Sociaal-etnische segregatie in de grootstedelijke gebieden van Litouwen

Etnische en sociaal-economische segregatie zijn in de meeste steden nauw met elkaar verbonden (bijv. Clark & Blue, 2004; Tammaru, Kährik, Mägi, Novák & Leetmaa, 2016). De meeste onderzoeken naar sociale segregatie richten zich op hoofdsteden. Er is veel minder bekend over steden op het tweede niveau. In dit laatste empirische hoofdstuk onderzoeken we de relaties tussen etnische en sociaal-economische segregatie in drie grootstedelijke gebieden van Litouwen, namelijk de steden Vilnius, Kaunas en Klaipėda. Dit zijn de enige macro-regionale centra die nog

het potentieel hebben om bevolking vast te houden in het snel krimpende land. Het zijn ook de belangrijkste bestemmingen van binnenlandse migratie in Litouwen. De beroepsstructuur in deze steden heeft de afgelopen decennia een sterke verschuiving doorgemaakt, met een scherpe stijging in beroepsgroepen met een hoge status. Daarom waren we geïnteresseerd in het effect van deze veranderingen op de patronen van sociaal-etnische segregatie in de grootstedelijke gebieden. We onderzoeken of de verschillende etnische groepen (Litouwers, Polen en Russen) een verschillende sociaal-economische status hebben, en hoe deze relatie in tien jaar mogelijk veranderd is.

We gebruiken gegevens op individueel niveau en op het niveau van censusgebieden uit de Litouwse volkstellingen van 2001 en 2011. Uit de resultaten blijkt een duidelijke relatie tussen sociaal-economische en etnische status van de bewoners, wat er dus op wijst dat etnische segregatie nauw verbonden is met de algemene processen van sociaal-economische segregatie. We zien ook dat hoe hoger het aandeel van een bepaalde etnische minderheidsgroep in een buurt is, hoe hoger het aandeel bewoners met een lage sociaal-economische status in deze groep. Bovendien concentreren etnische minderheden zich vaak in minder aantrekkelijke buurten. De relatie tussen sociaal-economische en etnische status was in de verschillende grootstedelijke gebieden niet even sterk. In Vilnius had de toenemende sociaal-economische segregatie een duidelijke etnische component. Dit betekent dat de sociaal-economische ongelijkheid tussen etnische groepen toeneemt. Sociaal-etnische segregatie neemt daarentegen langzaam af in de middelgrote grootstedelijke gebieden. Hoewel de sociaal-economische ongelijkheid toeneemt in deze gebieden, speelt de etnische dimensie op dit punt geen rol. Het niveau van etnische en sociaal-economische segregatie is in Litouwse steden weliswaar laag vergeleken met veel andere Europese steden, maar de segregatie neemt merkbaar toe. De toenemende sociaal-economische segregatie is met name duidelijk in het multi-etnische en in hoge mate dynamisch veranderende grootstedelijke gebied van Vilnius, waar etnische minderheden zich steeds meer in achtergestelde sociaal-economische posities bevinden.

7 Conclusies

Het doel van dit proefschrift was een bijdrage te leveren aan het opvullen van de bestaande kennishiaten met betrekking tot recente sociaal-ruimtelijke transformatieprocessen en de gevolgen daarvan in Litouwen. We wilden de volgende vragen helpen beantwoorden:

- Wat zijn de belangrijkste kenmerken en oorzaken van sociaal-ruimtelijke verandering in het postsocialistische Litouwen?
- Waarom kampt Litouwen ondanks economische groei en verbeteringen in de levensstandaard met grote problemen met betrekking tot extreme bevolkingsafname en toenemende sociaal-ruimtelijke ongelijkheid?

Litouwen heeft tegenwoordig een van de snelst krimpende bevolkingen ter wereld. Sinds de jaren 2000 neemt de bevolking jaarlijks met 1,2 procent af (Statistics Lithuania, 2017). Het proefschrift laat zien dat de bevolkingsafname, met emigratie als belangrijkste factor, gepaard gaat met veranderende woonpatronen en toenemende sociaal-ruimtelijke ongelijkheid in het hele land.

Het proefschrift behandelt een van de meest problematische trends in de sociaal-ruimtelijke ontwikkeling. Er is met name gekeken naar vier met elkaar verbonden gebieden van sociaal-ruimtelijke verandering: bevolkingsafname, verschuivende woonpatronen, segregatieprocessen en ruimtelijke ongelijkheid. We hebben het verloop van recente sociaal-ruimtelijke ontwikkelingen beschreven en onderzocht waarom de schaal en de impact van de bevolkingsverandering in Litouwen uitzonderlijk groot is. Het proefschrift laat ook zien hoe de sociaal-ruimtelijke structuren uit de Sovjetperiode zich in Litouwen hebben aangepast aan de markteconomie.

We hebben aangetoond dat de ruimtelijke ontwikkeling in Litouwen ongelijk verloopt, met duidelijk zichtbare trends van metropoolvorming en periferalisatie, en toenemende maatschappelijke ongelijkheid. Het gaat bij deze processen niet alleen om ruimtelijke herverdeling van de bevolking, maar ook om significante veranderingen in de bevolkingssamenstelling, zowel in de regio's die bevolking 'winnen' als in de regio's die 'verliezen'. Beide soorten regio's hebben met grote problemen te maken en de bewoners ervaren negatieve gevolgen van de processen, al zijn die voor de twee soorten verschillend. Bovendien gaat in Litouwen toenemende ruimtelijke ongelijkheid gepaard met extreme bevolkingsafnamecijfers, zodat de sociaal-ruimtelijke gevolgen ingrijpender zijn dan in veel andere landen.

Het hier gepresenteerde empirische onderzoek laat zien dat de recente sociaal-ruimtelijke ontwikkelingen in Litouwen in grote mate nog steeds worden bepaald door de erfenis van het planbeleid uit de Sovjetperiode, met name wat betreft de strategieën voor gedecentraliseerde ontwikkeling. Daarom kan de huidige trend richting centralisatie worden geïnterpreteerd als een verdergaande aanpassing van een sociaal-ruimtelijke Sovjetstructuur tot een structuur die beter past bij een kapitalistisch systeem en een markteconomie.

In de context van extreme ontvolking hebben grootstedelijke regio's te maken met verschillende problemen. Het zijn de enige gebieden die nog groeipotentieel hebben. In dit proefschrift hebben we bijzondere aandacht besteed aan sociaal-economische en etnische segregatie in de grootstedelijke regio's. Het segregatieniveau is in Litouwse steden weliswaar laag vergeleken met veel andere Europese steden, maar de segregatie neemt merkbaar toe. Het is waarschijnlijk dat de huidige trends zullen doorgaan en tot een verdere segregatie tussen arm en rijk zullen leiden. De toenemende segregatie is met name duidelijk in de multi-etnische grootstedelijke regio van Vilnius, waar etnische minderheden steeds meer in achtergestelde sociaal-economische posities terechtkomen. Toenemende segregatie gaat vaak gepaard met maatschappelijke spanningen. Een voorbeeld van de etnisch-politieke spanningen in de regio rondom Vilnius wordt geanalyseerd in hoofdstuk 4.

De bevindingen van dit proefschrift wijzen erop dat er meer planning nodig is op alle niveaus: op landelijk, regionaal en wijkniveau. Beleid voor ruimtelijke ordening, dat momenteel niet bestaat, zou een grote rol kunnen spelen bij de aanpak van de bevolkingsafname en toenemende sociaal-ruimtelijke ongelijkheid. In dit proefschrift wordt gesteld dat bevolkingsafname, anders dan vaak wordt gedacht, in Litouwen onvermijdelijk is. Het is erg moeilijk om dit proces te keren en verdere emigratie te voorkomen. De uitdaging ligt in het behoud van een goede balans tussen de behoeften van de bewoners en de financiële mogelijkheden van de staat. In elk geval is het waarschijnlijk het verstandigst om de planning te baseren op verdere bevolkingsconcentratie in de Litouwse steden. In de krimpgebieden is het mogelijk het meest efficiënt om de teruggang te accepteren en diensten te concentreren in goed bereikbare regionale centra.

Richtingen voor verder onderzoek

Uit de resultaten van dit promotieonderzoek blijkt dat het belangrijk is om meer nadruk te leggen op de ongelijkmatige sociaal-ruimtelijk ontwikkeling van Litouwen. De sociaal-ruimtelijke ongelijkheid neemt toe op verschillende ruimtelijke schalen: in het land als geheel, tussen en binnen de regio's en tussen en binnen de steden. Er is meer onderzoek nodig naar de processen van differentiatie van woongedrag en segregatie, en de effecten ervan op verschillen ruimten en groepen in de samenleving. Het is belangrijk om meer kennis te vergaren over deze processen, zodat een beleid voor ruimtelijke ordening kan worden geïmplementeerd dat gericht is op vermindering van de nadelige gevolgen van de bevolkingsafname en de ruimtelijk ongelijke gebiedsontwikkeling.

Er is meer aandacht nodig voor de krimpende regio's en de grootstedelijke gebieden. Er zijn toenemende zorgen over de negatieve demografische ontwikkelingen en de verslechterende economische situatie in de snel krimpende regio's, die samen bijna het halve land beslaan. Het is een grote uitdaging om de levensstandaard in deze regio's hoog genoeg te houden op een voor de staat betaalbare manier. In verder onderzoek naar deze gebieden moet worden gekeken naar de levensomstandigheden en behoeften van de bewoners. Hoewel de resultaten van dit proefschrift al inzicht bieden in selectieve migratie, is er meer onderzoek nodig naar bijvoorbeeld de vraag waarom mensen naar krimpende gebieden verhuizen, en wie deze mensen zijn. Grootstedelijke gebieden hebben te maken met verschillende problemen: een hoge graad van sociale ongelijkheid en toenemende segregatie. Hoewel uit onze resultaten blijkt dat het huidige niveau van de segregatie relatief laag is, bestaat er een ernstig risico dat de segregatie in de nabije toekomst toeneemt, vooral in Vilnius. Nader onderzoek en beleidsinterventies zijn nodig om een toename van de maatschappelijke spanningen te voorkomen.

Ten slotte zou Litouwen gebaat zijn bij vergelijkend internationaal onderzoek naar de Baltische staten, die ongeveer dezelfde historische en geografische context hebben. Er wordt hechtere samenwerking tussen de Baltische staten verwacht bij de ontwikkeling van regionaal beleid, met name ten aanzien van hun krimpende steden en regio's. Bovendien kunnen andere landen leren van de extreme bevolkingsafname in Litouwen. Het is zeer opmerkelijk dat bij een gestaag groeiende economie en een steeds hogere levensstandaard de bevolking afneemt, en dat deze trend steeds sneller lijkt te gaan.

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1 Introduction: Socio-spatial change in Lithuania. Depopulation and increasing spatial inequalities

Perhaps what first strikes you when you travel into Central and Eastern Europe is the incredible mélange of practices, rhythms, and identities that flow through particular places; past and present landscapes seem literally to tumble over each other suggesting that something new is underway, something old is being sustained, and something that combines the two is emerging. State socialist and market economies are articulating and re-articulating with one another in a heady mix of creative destruction and social transformation. (Pickles and Smith, 2007, p. 152)

§ 1.1 Introduction

The fall of the Berlin Wall in 1989 signalled a major change for Europe, especially for Central and Eastern European (CEE) countries[1] (Gentile, Tammaru, & van Kempen, 2012; Kornai, 2006; Kovács, 1999; Shleifer & Treisman, 2014). From a Soviet-type communism[2] with centrally planned economies, CEE countries suddenly shifted to a capitalist system with market-led economies. Almost overnight the political and economic systems completely changed. This shift had a major effect on population developments in these countries. All of them experienced a drop in fertility rates, mass emigration and an increase in regional inequalities. Of all the post-socialist countries, it is Lithuania that stands out the most, experiencing an extreme drop in population (Eurostat, 2017;

1 The term Central and Eastern Europe (CEE) in this thesis is used for countries that were part of the Soviet communist block from 1945/1950 to 1989/1991, and are now EU Member States: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and the former East Germany.

2 We use the terms 'socialist' and 'communist' as synonyms in this paper, although communism is an extreme form of socialism. Communism is a political system, while socialism is primarily an economic system which can exist under various political systems ('Diffen', 2017).

United Nations, 2015).[3] Since the 1990s, Lithuania has lost more than 20 percent of its population, which makes it one of the world's fastest shrinking countries.

From a historical point of view, an extreme population decline seems contradictory in Lithuania. For several decades the citizens of Lithuania had passionately sought a new sovereignty that would bring independent and democratic development to the country. This goal was finally achieved in 1990. In general, independence was a success and an accomplishment that led to a new economic and constitutional order (Burneika, 2012; Kornai, 2006; Leyk, 2016; Stanilov, 2007). However, the opening of the borders to the West and the free flow of capital and labour (especially after integration into the EU), meant that many people decided to leave Lithuania to look for better opportunities (mostly economic) abroad (Klüsener, Stankūnienė, Grigoriev, & Jasilionis, 2015; Sipavičienė & Stankūnienė, 2011; *The Economist*, 2017). Many of them thought to be leaving temporarily, but stayed and never returned. The reasons behind the choice to emigrate are quite obvious: although GDP per capita levels are similar among CEE countries (The World Bank, 2017b), Lithuania is distinguished in having one of the lowest wages, pensions and social spending rates, as well as a high degree of social inequality (Aidukaitė, 2011, 2014). Furthermore, population decline is accelerating even though the economy of the country is growing and standards of living are improving.

While the processes taking place on the national level are quite well recognised in Lithuania, little is known about how macro-level changes are affecting different spaces and groups in society. Sharp population decline has been accompanied by an increase in regional inequalities and levels of segregation. These processes are strongly linked with Soviet spatial planning principles (see e.g. Clayton & Richardson, 1989; Demko & Regulska, 1987) that were more extensively adopted in Lithuania than in other CEE countries. For several decades, planning policy in Lithuania favoured the organised distribution of the population and economic activities (Šešelgis, 1996; Vanagas, Krišjane, Noorkoiv, & Staniūnas, 2002). As a result, a quite uniform – spatially and socially – society was created.

In 1990, the moment market forces came into play, major changes in the socio-spatial fabric began to occur and the distribution of the population started to change, having major spatial and social consequences. For example, economic restructuring led to a spatial mismatch between the distribution of labour and available jobs; although residential patterns started to change, the network of public amenities remained almost

3 To be more accurate, similar drop in a population can also be found in Latvia, however population is declining more rapidly in Lithuania since 2006.

unaffected (until now). The general feature of this process was that, economically and demographically, socio-spatial disparities started to increase within the country, with the larger urban regions becoming the 'winners' and the peripheral rural regions the 'losers' in this transformation process. Vilnius, whose development was suppressed in Soviet times, began growing extensively after 1990 through the process of suburbanisation. The process was similar to but much quicker than what had occurred in Western countries two decades earlier (from the 1970s onwards). In Lithuania, this led to increasing regional inequalities, which was inhibited to some degree by the socialist system, but now, the market-led system left regions much more exposed.

Despite the fact that these recent socio-spatial changes continue to take place at an unusually high speed, these processes have received very little scientific attention. *The **aim** of this thesis is to gain more insight into these socio-spatial transformation processes and their consequences in Lithuania. The thesis investigates the main features and drivers of socio-spatial change in post-socialist Lithuania.* The results of the research will provide a better understanding of the development processes and will reveal how the Soviet-designed socio-spatial structures adapted to a market economy environment. The results of this thesis will also show why we should be concerned, despite the growing economy and improvements in the standard of living, as Lithuania is facing major challenges related to extreme population decline and increasing socio-spatial inequality. Until recently, doing socio-spatial research on Lithuania was a major challenge due to very limited data availability. One of the achievements of this thesis was to gain access to more detailed statistical data. As a result, this thesis is the first research project to use individual-level geo-coded Lithuanian census data for the whole population.

The rest of this introductory chapter is structured as follows. Section 1.2 provides the background, presenting a historical overview and explaining the specific setting of Lithuania, also offering information about the general macro-level changes that took place in the socialist and post-socialist periods. This background information is crucial to an understanding of the more recent socio-spatial changes and processes behind them. Section 1.3 offers a more focused discussion of the literature on population decline, migration, suburbanisation, segregation and increasing regional inequalities. It provides a literature review concerning the processes that are both typical to Lithuania but also shared with many other countries. This section aims to demonstrate that the Soviet legacy formed specific conditions for rapid and profound socio-spatial change in Lithuania. In Section 1.4, the gaps in current knowledge are identified, and the aim and research questions of the thesis are presented. Finally, Section 1.5 outlines the data that were used in the empirical chapters. Apart from this introduction, the thesis consists of five empirical chapters and a conclusion.

§ 1.2 Historical background of Lithuania

Over the course of recent centuries, Lithuania has been an independent country for only a short period of time, with Russian governance having the greatest influence on its development. From the end of the eighteenth century until the First World War, Lithuania was under the rule of the Russian Empire. Later, from 1918 to 1940, it was an independent state with a very strong national identity. However, the capital city of Vilnius and its surrounding region was disputed territory, with Lithuania, Russia and Poland all commanding it in different periods. Eventually this region was taken by the Polish administration. The period of Polish governance in the Vilnius region lasted from 1920 to 1939. This period showed a strong growth in the Polish population as well as a strengthening of the Polish identity of local residents throughout the Vilnius region (Stanaitis & Česnavičius, 2010). Today, inhabitants who identify as Polish are highly concentrated in the region surrounding Vilnius city and constitute the largest ethnic minority group in Lithuania (6.6% in 2011) (Statistics Lithuania, 2013).

In 1940, Lithuania was incorporated into the Soviet Union. The country lost its autonomy and Moscow became the most important decision-making centre, with the country only regaining its independence five decades later, in 1990, soon after the fall of the Berlin Wall. Interestingly, the percentage of Russian inhabitants remained relatively low in Lithuania during the Soviet period. The Russian minority accounted for 9.4 percent of the population in 1989 and 5.8 percent in 2011 (Statistical Office of Estonia, Central Statistical Bureau of Latvia, & Statistics Lithuania, 2015). By comparison, in Estonia and Latvia the share of Russians was above 30 percent in 1989 and still above 25 percent in 2011 (ibid.). This thesis will analyse population developments in the post-Soviet period.

The Soviet Union is sometimes referred to as 'the Great (unsuccessful) socialist experiment' (Namboodiripad, 1991). The collapse of the Soviet Union[4] is identified as one of the life-transforming moments in world history (Smith & Timár, 2010), while the radical reforms in post-communist countries that followed this collapse have been called 'shock therapy' (Leyk, 2016). The consequences of the breakdown of communism were especially significant for the Baltic States of Lithuania, Latvia and Estonia. Unlike other CEE countries, the Baltic States were Republics of the Soviet

4 The official dissolution of the Soviet Union was on 26 December 1991. However, all of the countries declared their independence before this day, with Lithuania being the first Soviet Republic to break away from the Soviet Union.

Union[5] in a 'self-enclosing' communist system. In this system, political, economic and social relations with other European countries (even socialist) were virtually non-existent, while, at the same time, there were no internal borders (either political or economic) between the Soviet Republics. Later, the Baltic States all successfully joined one of the most liberal and open economies in the world – the European Union.[6]

This shift had a major effect on the political and economic systems, as well as on the urban and regional planning systems and economic restructuring. It also meant that the Baltic States completely changed their status: from a relatively affluent and prosperous region in the Soviet Union they became the relatively poor periphery of a borderless European Union. In parallel, from being the receivers of large inflows of immigrants from the other Soviet Republics, they started to lose their populations, due to large-scale out-migration to Western countries (Klüsener et al., 2015). Nearly 30 years have passed since the political reforms, which makes it timely to reflect on the dramatic set of political-economic and socio-spatial transformations that occurred, and to consider the social and economic consequences of these transformations (Smith & Timár, 2010).

§ 1.2.1 Political and economic system change

For five decades, Lithuania and other CEE countries lived under a communist regime subject to a command (planned) economy model, which was based on the principles of central planning (Borén & Gentile, 2007; Sjöberg, 1999). The countries were isolated from the rest of Europe, with the Iron Curtain the symbol of the ideological conflict between communism and capitalism. The differences between these ideologies are more than obvious, covering many political, economic and social aspects (Brada, 1994; Gentile et al., 2012; Kornai, 2000). The key elements of the communist system are centralised government, a command economy and collective, in fact, state ownership. In contrast, the key elements of a capitalist system are limited government intervention in economics, a market-based economy, competition and private ownership.

5 Lithuania, Latvia and Estonia were involuntary incorporated into the Soviet Union under the Molotov-Ribbentrop pact in 1939; Lithuania declared independence in 1990 and Latvia and Estonia in 1991.

6 All three countries have been members of the European Union as well as NATO since 2004.

The traditional Soviet system had a vast, complex and highly hierarchical political-administrative structure (Ericson, 1991). This was needed to implement the centrally planned economy, where all the decisions were taken by the government in a top-down approach. The central government controlled the allocation of resources and the distribution of products and services. Virtually all property (except personal belongings such as cars and single-family dwellings) and the means of production were owned by the State; including the assets in the industrial, energy, financial and public sectors (Fischer & Gelb, 1991). Although there was a small legal private-production sector (e.g. small-scale agriculture, arts and crafts), it was also subject to substantial control by the State's political and economic apparatus (Ericson, 1991). There was also a shadow economy, but it is difficult to estimate its size. In addition, the absence of a land market (land officially had no price) prevented its optimum economic use, especially in the centrally located urban zones where an excessive share of industrial land was located (Bertaud & Renaud, 1997).

When the Soviet Union collapsed, CEE countries shifted their economies away from central planning and adopted market economy principles (Smith & Rochovská, 2006). State intervention in the economy was reduced and the markets liberalised. According to neo-liberalist thought, free markets lead to the most effective and balanced organisation of economic and social life (Harvey, 2007). Given the nature of the communist regime (e.g. the absence of a land market, competition and private property) and the principles of central planning (with priority given to industrial and agricultural development, controlling the size and hierarchy of cities, restricting suburban growth, etc.), it is no surprise that the transition brought radical economic and social change to CEE countries. This is sometimes referred to as the 'return to Europe' process (Leyk, 2016; Pickles & Smith, 2007). In addition, the rapid technological, economic and social progress that accompanied the processes of urbanisation, globalisation and regionalisation further reinforced ongoing transformation in post-communist countries (Kornai, 2006). All of these developments contributed to significant economic restructuring, with the main changes related to a switch from collective (state) to private ownership and from the dominance of the primary and secondary sectors to the dominance of the tertiary sector. As a result, while systematic political and economic changes led to growing economic diversity and land use efficiency, there was an increase in unemployment and growing regional and social inequality, which will be discussed in the following sections.

It is now almost three decades since CEE countries embarked on paths of development similar to their Western counterparts. The borders between European countries are open and the movement of capital and labour is free. A lot of money is invested in EU regional cohesion policy, which aims to reduce disparities between EU countries and regions (Bachtler, Berkowitz, Hardy, & Muravska, 2017; Cotella, Adams, & Nunes, 2012). However, the contrast between Eastern and Western Europe persists (Börzel &

Schimmelfennig, 2017; Hudson, 2005). Although the economies of CEE countries have been growing considerably faster than those of Western EU countries over recent decades, CEE countries still have much lower levels of GDP per capita (The World Bank, 2017b).

Currently, the major differences between Eastern and Western Europe are reflected in demographic trends. CEE countries are characterised by significant population decline, emigration and an emerging shortage of labour. Although it can be argued that there were differences between Eastern and Western Europe even before the Second World War, the influence of the communist period on the long-lasting and ongoing socio-spatial processes is undeniable. In Lithuania, this influence is manifest in rapidly changing residential patterns, the shrinkage of both urban and rural areas, intense suburbanisation of major cities, and increasing social and regional inequalities, as well as other socio-spatial processes, all of which will be discussed in this dissertation.

§ 1.2.2 Urban and regional planning policy change

The centrally planned economy was tightly intertwined with regional planning policies (Stanilov, 2007). The main function of regional planning was to facilitate economic growth throughout the countries. At the same time, the aim of the communist doctrine was socio-spatial equality, and an evenly spread population was one of the prerequisites for such equality. One of the ways to achieve this was through the spatial distribution of human and economic resources (Bertaud & Renaud, 1997). According to Gentile and colleagues (2012, p. 292), there was an intention to 'annihilate social, economic and regional differences and inequalities, effectively pushing for complete social, economic and spatial homogenisation over time'. Population movement was prohibited between the communist states, as well as within the national borders, sometimes even within municipalities (Clayton & Richardson, 1989; Klüsener et al., 2015).

While the general principles of the political and economic system were common to all post-socialist countries, regional planning policies varied from country to country. The main reason for this was that concrete planning decisions could be taken by local planners. Nevertheless, the general principles of communist ideology still had to be followed. Furthermore, at any moment, Moscow could demand that the decisions taken locally be changed. Although there were variations between countries in terms of the adaptation of planning principles, the communist period had a strong impact on the socio-spatial organisation of CEE countries and resulted in different development paths compared to Western European countries (Bertaud & Renaud, 1997; Fenger, 2007; Sailer-Fliege, 1999; Tammaru, Marcińczak, van Ham, & Musterd, 2016).

What makes Lithuania unique is that Soviet spatial planning ideology was introduced more consistently here. Regional planning was based on a strategy to decentralise the population and industry, distributing them throughout the country (Vanagas et al., 2002). This meant that part of the potential growth of the few largest cities was distributed to medium and small-sized cities. Thus, the dominance of the largest cities was reduced and the development of regional centres enhanced. This was done through housing and employment policy (Bater, 1980; Šešelgis, 1996; Sýkora & Čermák, 1998). As a result, and in addition to some other historical and geographical circumstances,[7] by the end of the socialist period, the urban system was more balanced in Lithuania than in any other CEE country (Aberg, 2005). Vilnius accounted for 15.7 percent and Kaunas (the second largest city) 11.4 percent of the total population in 1989 (Statistics Lithuania, 2003).

A different planning approach was applied in Latvia and Estonia, which resulted in highly monocentric urban systems in these countries, with the capital cities accounting for more than 30 percent of their total populations in 1989 (Statistical Office of Estonia, Central Statistical Bureau of Latvia, & Statistics Lithuania, 2003). Under the communist regime, the Soviet-designed territorial organisation of Lithuania performed relatively well and was perceived as an achievement by Soviet urban planners (Vanagas et al., 2002). Such regional policy was only possible in a society without market competition and private property.

Since the 1990s, residential mobility has no longer been centrally regulated in Lithuania. Moreover, market economy forces, along with personal and economic motives of individuals, began to play key roles in the socio-spatial development of the country. A strengthening of domestic and international competition, processes of globalisation, and other effects, resulted in a new stage of social and economic development, also triggering spatial transformations. Due to the different locational priorities of the new economic sectors, as well as increased mobility opportunities for residents, the socio-spatial organisation of the country started to change. Economic activities and population started to concentrate in the major-city regions, especially in Vilnius. For example, 40 percent of the economic entities of Lithuania were concentrated in the Vilnius city region in 2016 (Statistics Lithuania, 2017). Moreover, one third of all births occurred there in 2016 (ibid.).

7 Vilnius is located on the edge of the country, close to the Belarus border. Kaunas (the second largest city) was the temporary capital city of Lithuania in the interwar period. Klaipėda (the third largest city) is the main seaport of Lithuania.

At the same time, many regions whose growth had been stimulated during the Soviet period became unable to provide sufficient levels of employment and standards of living under the new competitive economic conditions. This meant uneven spatial development, with clearly visible trends of metropolisation and peripheralisation, as well as increasing social inequalities (Cirtautas, 2013; Krupickaitė, 2003; Vanagas et al., 2002). While similar patterns of change can be found in all CEE countries in the post-Soviet period (Borén & Gentile, 2007; Lang, Henn, Sgibnev, & Ehrlich, 2015; Schmidt, Fina, & Siedentop, 2015), more profound changes can be anticipated in Lithuania, because the territorial organisation of Lithuania was affected to a greater extent in the communist period.

§ 1.2.3 Economic restructuring[8]

The centrally planned organisation and regulation of economic activity was an essential part of the communist regime in the Soviet Union. It is often believed that it was the command (planned) economy model and its inefficiency that led to the collapse of the Soviet Union (Harrison, 2001, 2002). In this system, the central government played the major role in directing the structure of the economy, as well as investment in and allocation of production (Samonis, 1995). Moreover, as the owner of all assets, the government controlled supply and predicted demand (often incorrectly), as well as set the prices of all goods and services. This resulted in massive shortages of various products and 'empty shelves' (Leyk, 2016). The economy of the Soviet Union was also isolated – there were very few trade relations with external parties (natural resources needed for industry were the exception). In a system where it was almost impossible to draw a line between politics and economics, there was no need to avoid monopolies, prevent corruption, efficiently allocate skills and talents of people and to maintain a balance between quality and price (Nove, 1986).

Nevertheless, it should be mentioned that there were periods when the economy of the Soviet Union grew rapidly and even raised interest in capitalist countries. For example, some economists have even suggested that the 'Soviet-style economies were superior to capitalist ones in terms of economic growth, providing full employment and price stability' (Acemoglu & Robinson, 2012, p. 127). However, it has generally been acknowledged that its economic success was, according to Ericson (1991, p. 11),

8 This section is based on the paper: Ubarevičienė, R. & Burneika, D. (2015). Spatial transformation of the economy in the post-communist period: The case of the Vilnius urban region. *Geographia Polonica, 1*(88), 143–157.

'largely a statistical illusion, fostered by mismeasurement, faulty methodology, systemic incentives for exaggeration, and ideologically and politically motivated distortion'. Although it was true that the socialist state provided all citizens with a job and a salary, the outcome was that individuals did not need to make much effort to hold on to them. Accordingly, 'there was no space for individual responsibility, initiative, ambition and autonomy' (Leyk, 2016, p. 647).

A few specific aspects of the structure of the economy may explain why the Soviet Union collapsed. Industry, with priority given to heavy industry, including the military, was the main sector of the economy. Although it was the most important sector, it did not develop a strong technological base and thus used outdated and resource-wasting technologies which were behind world standards (Samonis, 1995). An important role was also played by the agricultural sector, especially in the Baltic countries. The Baltic States had a major role as suppliers of agricultural production to the Soviet Union (Lerman, Kislev, Biton, & Kriss, 2003; Viira, Põder, & Värnik, 2009). Their residents were encouraged to live and work in rural settlements, where they were provided with housing and income, often at a higher standard than in the cities (Tammaru, 2001). As a result, in the Baltic States, employment in agriculture (% of total employment) was more than 20 percent at the end of the Soviet period (The World Bank, 2017a). In comparison, it was less than 5 percent in many advanced capitalist countries. Other 'unproductive' sectors, such as housing construction, the service sector and infrastructure, were underfunded in CEE countries (Sailer-Fliege, 1999). As Ericson (1991, p. 11) noted, '[i]t is increasingly apparent that the traditional Soviet-type command economy is a catastrophic failure' and '[s]ignificant economic reform is now generally accepted as an imperative'.

After the demise of the Soviet Union, many impulses propelled economic development in CEE countries. Economic reforms included privatisation, liberalisation, marketisation, technological progress and integration with the world economy (Brada, 1994; Fischer & Gelb, 1991; Frenkel, 1994). Many inefficient industries were closed and the agricultural sector modernised, thus reducing employment in these sectors (Hamilton, Andrews, & Pichler-Milanovic, 2005; Leetmaa & Tammaru, 2007; Tammaru, 2001). In Lithuania, this meant 40 percent of jobs were lost between 1989 and 2001, mainly in industry, construction and agriculture (Statistics Lithuania, 2017). The unemployment rate was as high as 20 percent in some CEE countries at the beginning of the 1990s (a drastic change from a system in which everyone was entitled to have a job) (Hamilton, Andrews, & Pichler-Milanovic, 2005; Kornai, 2006). Thus, it is no surprise that people found it difficult to adapt to the new economic structure, as well as the rules of the capitalist economy (Leyk, 2016). From a system in which 'everything' was given to people, they now had a system in which they had to compete for 'survival'. The consequences of the reforms were not the same for different groups of the population. Those who

benefited were mostly well-educated, younger, entrepreneurial individuals. The most disadvantaged were industrial and agricultural workers, those less educated and the elderly. There were significant changes in the social class structure, with the Soviet-era privileged working class hit the hardest (Gerber & Hout, 2004).

Shortly after the reforms, new economic sectors (above all, business services) started to develop, bringing down the level of unemployment and accelerating economic growth in CEE countries. In order to achieve this, the CEE countries had to completely rebuild their economies and divert the trade flows from east to west (Leetmaa, Tammaru, & Anniste, 2009). They had to find ways to enter global markets without having the experience, technology or proper institutional settings. Moreover, their economies had to develop at an accelerated speed in order to catch up with Western countries (Kornai, 2006). The initial advantage of CEE countries in relation to global competition was their relatively cheap labour force. While this helped to withstand the economic shock by attracting foreign investment, at the same time, it laid the foundations for the wage gap, which persists today. Substantial improvements in transportation and connectivity also contributed to economic restructuring. The most important economic factors became efficiency and profitability, which were almost non-existent criteria in the Soviet period.

Economic restructuring was more challenging for the Baltic States due to their greater involvement in the Soviet economic system (through capital, trade and labour flows), less developed relationships with other European countries, and also because of their peripheral location with respect to their new trading partners in Western Europe.

Increasing role of the capital city regions

Numerous studies have shown that post-socialist economic development in CEE countries favoured their capital city regions (Borén & Gentile, 2007; Grigorescu et al., 2012; Jacobs, 2013; Smith & Timár, 2010; Sýkora & Ouředníček, 2007). The capital cities, which served as the main gateways to CEE countries, had a higher potential to attract investment and to develop high value-added economic sectors. They became the headquarters of international and national companies. In many countries, the capital regions now account for disproportionately large shares of their respective countries' economic development.

The increasing role of the Vilnius urban region and the processes of metropolisation in Lithuania resemble the experiences of other post-socialist countries (Ubarevičienė, Burneika, & Kriaučiūnas, 2011). Since the 1990s, spatial, economic and social development has been much more intense in the Vilnius urban region than in the rest

of Lithuania. For example, foreign investment has constantly increased in Vilnius, and in 2015 it received 71 percent of the total foreign investment in Lithuania (Statistics Lithuania, 2017). In the same year, although the Vilnius region accounted for 27 percent of the population, it created 40 percent of the country's GDP and accounted for 45 percent of income tax (ibid). Vilnius has thus become the core of the country's development.

The post-socialist economic development of the Vilnius urban region may be characterised as a process of transformation (conversion) of the old urban structure and the spatial expansion of the urban economy through suburbanisation. In Vilnius, like other post-socialist countries since the 1990s, industrial areas in the inner city have shrunk, while the service sector has grown. The spatial network of many enterprises has become much denser, expanding along with urban sprawl. For example, the number of restaurants, fuel stations, accountancy and auditing firms increased drastically between 1994 and 2011 (Burneika & Ubarevičienė, 2011). Moreover, the outward expansion of the city transformed rural agricultural areas into urban zones and introduced 'urban economies' into the surrounding Vilnius region. While the suburban zone accounts for a relatively small portion of the total urban population, socioeconomically it is an important and integral part of the Vilnius housing market and region, which has experienced the most intensive socio-spatial change.

§ 1.3 Socio-spatial developments

The historical background provided above is important to an understanding of the recent socio-spatial changes and the processes behind them. In the context of the macro-level changes presented above (changes to the political and economic system, urban and regional planning policy, and economic restructuring), this section focuses on four areas of social-spatial change: population decline, shifting residential patterns, social segregation and regional inequalities. Figure 1.1 schematically illustrates the structure of this thesis, and the relationships between the macro-level changes and the four areas of socio-spatial change. It has to be noted, that all three general macro-level changes, located in the outer circle, have an important effect on four areas of socio-spatial change. Meanwhile, these four areas are closely interrelated and affect each other. The figure also positions the five empirical chapters and the broad research questions they will address.

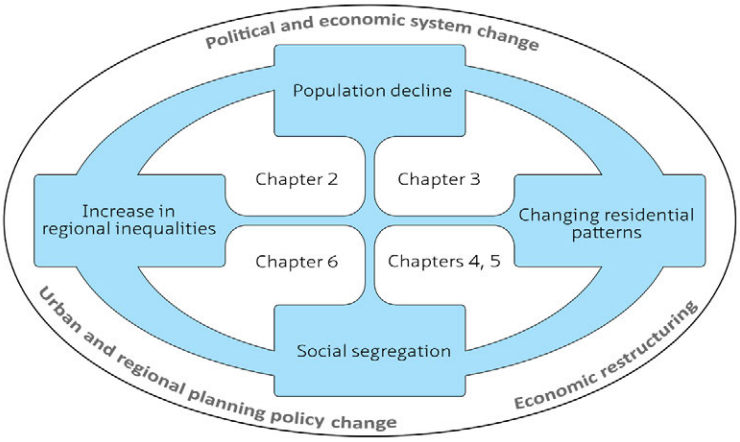

FIGURE 1.1 Structural overview of the thesis

In recent decades, many developed and developing countries have been confronted with population decline, increasing regional inequalities and greater levels of social segregation (Haartsen & Venhorst, 2010; Haase, Athanasopoulou, & Rink, 2016; Hospers, 2012; Pourahmad, Khavarian-Garmsir, & Hataminejad, 2016; Reher, 2007; Wolff & Wiechmann, 2017). These processes were particularly characteristic of CEE countries that experienced political-economic transition (Brade, Herfert, & Wiest, 2009; Gentile et al., 2012; Lang, 2011; Schmidt et al., 2015; Smith & Timár, 2010). Considering the discussion above, it can be expected that more profound socio-spatial changes took place in Lithuania during the post-socialist period; firstly, due to its exceptional geopolitical situation (the experience of a radical shift from the Soviet Union to the EU by Lithuania and the other Baltic States); and, secondly, due to the specific legacy of Soviet planning policy.

This section provides a literature review regarding the processes of socio-spatial change which characterise the experience of Lithuania, although they may be shared with many other countries. There are four major aspects of this socio-spatial change: population decline, changing residential patterns, segregation and increasing regional inequalities. All of these processes are closely intertwined. For example, it is known that population decline, especially if it is determined by migration processes, is usually followed by growing regional inequalities and increasing levels of segregation (Cortese, Haase, Grossmann, & Ticha, 2014; Fol, 2012).

§ 1.3.1 Population decline

Population decline depends on political, economic and social conditions and is therefore multifaceted, complex and usually difficult to predict (Haase, Bernt, Grossmann, Mykhnenko, & Rink, 2016). In most cases, depopulation is seen negatively and attempts are made to reverse it. However, once population decline in an area has started, it is difficult to reverse, and the decline continues (although this is not a fundamental rule) (Hudson, 2015b; see also Myrdal, 1957). Depopulation often begins with economic downturn and becomes part of a vicious circle, causing a downward spiral of the economy, declining tax revenues, a decline in service provision and social infrastructure, and increasing numbers of abandoned buildings (Elshof, van Wissen, & Mulder, 2014). Such self-reinforcing developments make the shrinking areas even less attractive to the people who are left behind and increase the probability that they will also leave. Myrdal (1957) has described this as 'circular cumulative causation'. According to Fratesi and Percoco (2014), persistent population decline, especially when it is accompanied by an aging population and 'brain drain', is the most harmful and difficult to reverse, as it leads to imbalances between regions and may hinder economic growth (Cortese et al., 2014).

The phenomenon of population decline is not unique. Today, increasing numbers of cities and regions around the world are facing population loss. There is a large body of literature on population decline in peripheral, sparsely populated and former industrial regions of Europe, such as northern Sweden (Eriksson, 2008; T Niedomysl & Amcoff, 2011), rural France (Fol, 2012; Kupiszewski, Baccaini, Durham, & Rees, 2000), Spain (Collantes, Pinilla, Sáez, & Silvestre, 2013; García Coll & Stillwell, 1999) and Scotland (Slee & Miller, 2015; Stockdale, 2002, 2004), the former East Germany (Bontje, 2005; Eberstadt, 1994; Lang, 2012). It is surprising that a lot less attention has been paid to developments in CEE countries, as, in recent decades, many of them were among the fastest shrinking countries in Europe and the world at large (Eurostat, 2017; United Nations, 2015). The pattern of population change in Europe, with a clear divide between east and west, can be seen in the map in Figure 1.2 (Wolff & Wiechmann, 2017; German Federal Institute for Research on Building Urban Affairs and Spatial Development, 2015). This pattern is mainly the result of political and economic reforms in post-socialist countries and the successive increase in international migration from these countries. The reforms in the 1990s and the enlargement of the EU in 2004 opened the borders within Europe and lifted restrictions on mobility, causing large migration flows from Central and Eastern Europe to Western Europe. Population decline was especially sharp in the Baltic and Balkan countries. In many, including Lithuania, population decline was not limited to decline in certain regions or cities but affected the whole country.

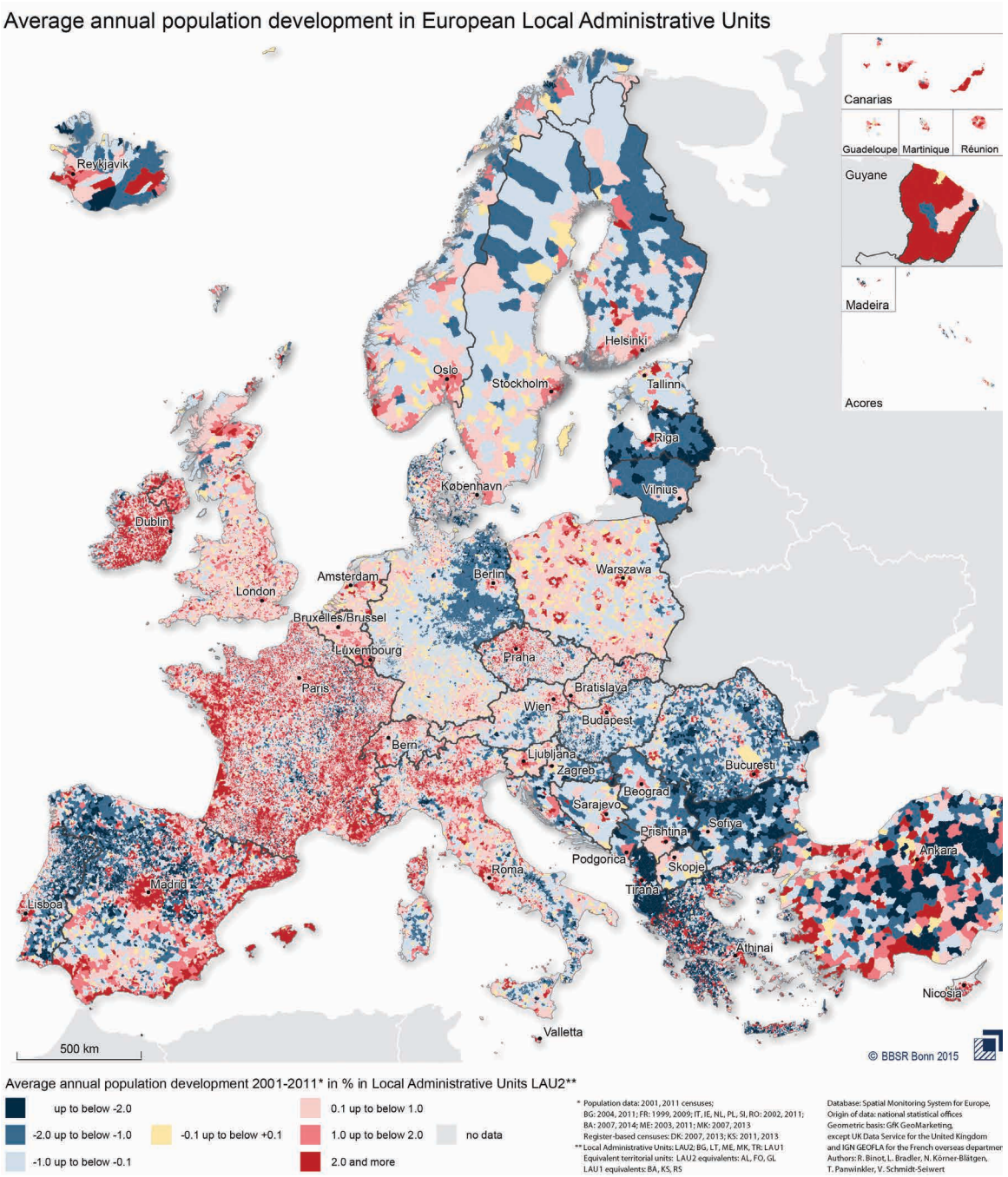

FIGURE 1.2 Avergage annual population change in Europe between 2001 and 2011
Source: German Fedaral Institute for Research on Building Urban Affairs and Spatial Development, 2015

Lithuania is one of the 'leaders' in terms of population decline in the post-socialist region and in the world overall (United Nations, 2015). According to census data, in the period between 1989 and 2011, the country lost 17.2 percent of its residents. The actual loss may be as high as 25 percent, because many emigrants do not officially declare they have left the country (Civinskas, Genys, Kuzmickaitė, & Tretjakova, 2011; Sipavičienė & Stankūnienė, 2011). The population started to decline soon after the reforms, primarily due to the outflow of former immigrants from other former Soviet republics (mainly from Russia). In fact, these immigrants were an important source of population growth in Lithuania during the Soviet period. In 1989, the Lithuanian population was 3.6 million, and it was expected that the number would reach 4 million within the coming decades. However, instead of growing, it started to shrink, with the population census of 2011 recording a little over 3 million inhabitants. The population decrease accelerated over time, and, since the 2000s, the country has been shrinking, on average, by -1.2 percent every year (Statistics Lithuania, 2017). The pessimistic scenario, according to the United Nations as well as the majority of Lithuanian demographers, predicts that the country might lose half of its current population by 2100 (Jackevičius, 2016; United Nations, 2015). In addition, the population change varies a lot across Lithuania. Some regions have already lost close to half their population, while other regions almost doubled in population between 2001 and 2011. The geography of population decline in Lithuania is analysed in Chapter 2 of this thesis.

The controversial role of emigration

Although this thesis does not directly address the questions related to emigration, this is an important element in the population decline and thus in the current processes of the socio-spatial change in Lithuania. Emigration accounted for approximately 80 percent of total population loss over the past decade (Statistics Lithuania, 2017). Within a decade of Lithuania entering the EU in 2004, 10 percent of the population had emigrated to Western countries (Klüsener et al., 2015). Lithuania now has one of the highest emigration rates in the EU (Eurostat, 2016).The number of incoming migrants has been very small and the natural change in the population is negative.

In most cases, emigration is a response to labour market conditions and educational opportunities (Genelyte, 2017; Kazlauskienė & Rinkevičius, 2006; Sipavičienė & Stankūnienė, 2013). The main reason of high rates of emigration from Lithuania is a mismatch between demographic and economic structures. This mismatch started to emerge right after the 1990s when the structure of economy began to reorganize and unemployment to increase, and at the same time a lot of young people grew to enter the labour market, while the post-war baby boom generation was still

economically active. New jobs were not created fast enough to guarantee jobs for everybody, thus emigration, of mostly young people, began to increase rapidly. Although between 2004 and 2015 10 percent of the total population emigrated abroad, this did not have much effect on the number of employed persons in Lithuania (Statistics Lithuania, 2017). It is highly unlikely that Lithuania's economy would have been able to create as many new jobs, as many people have emigrated. These new vacancies would have had to make one third of all existing jobs. An increase in the retirement age and the greater employment of retirees have also reduced the growth of wages and employment opportunities of young generation. According to Klusener et al. (2015), another reason encouraging emigration from Lithuania is a mismatch between the supply and demand of highly educated workers. Many people decide to leave the country because they feel undervalued. For example, an average gross salary of the Vilnius university staff was 705 euro in January 2017, while the total average in Lithuania was 823 euro ('Lithuanian State Social Insurance Fund Board', 2017).

On the other hand, there are those who see advantages in emigration. For example, personal remittance inflows have accounted for approximately 4 percent of total annual GDP since 2010 (Sipavičienė & Stankūnienė, 2013; The World Bank, 2017c). Emigration also reduces unemployment levels. According to the Statistics Lithuania (2017), during the global financial crisis in 2007-2011, 80 percent of those who emigrated from Lithuania abroad were long-term unemployed. Thus, in the absence of mass emigration other negative effects, such as high unemployment and crime rates, may have had occurred.

In 2010, research on potential migration from Lithuania revealed that around 30 percent of the adult population of Lithuania had the intention to emigrate. Among young people (up to 29 years), 58 percent said they would like to emigrate (Sipavičienė & Stankūnienė, 2011). As a result of emigration, the mean age of the Lithuanian population is rapidly increasing: from 37.7 years in 2001 to 41.5 years in 2011, and the share of pensioners has grown by 4 percent over a decade. As a consequence, the economy of the country is increasingly being 'drained', as social spending increases while the country is losing an important part of the workforce. The current demographic trends in CEE countries, including Lithuania, have been described as 'demographic shock' or 'demographic crisis' (Eberstadt, 1994; Rychtaříková, 1999; Sobotka, Zeman, & Kantorová, 2003; Vladislava Stankūnienė, 2003; Steinführer & Haase, 2007). It is obvious that such trends have adverse future effects on welfare, social security and economy of Lithuania and other CEE countries.

The literature review on population decline in Lithuania can be summarised as follows:

- Lithuania is one of the 'leaders' in terms of population decline in the post-socialist region and the world overall.
- In Lithuania, population decline started soon after the 1990s: while in Soviet times there was an inflow of migrants from other Soviet Republics, after the 1990s, a large-scale out-migration to Western countries began.
- Although depopulation affects almost the entire territory of Lithuania, there are great spatial variations in population change throughout the country.
- The role of emigration is ambivalent in Lithuania. While it reduces the levels of unemployment and generates approximately 4 percent of the total annual GDP through the personal remittances, at the same time due to the emigration Lithuania is losing an important part of the workforce.

§ 1.3.2 Changing residential patterns: the outcome of migration

Previous studies have shown that migration plays a major role in the processes of population redistribution and growing spatial imbalances (Ambinakudige & Parisi, 2015; Boyle, Halfacree, & Robinson, 1998; Martí-Henneberg, 2005; Ubarevičienė, 2016). Migration is a cause as well as the consequence of socio-spatial change. This can be explained from both a macro and micro perspective. According to Cadwallader (1992, p. XV), the 'macro approach is concerned with explaining aggregate migration patterns by measured characteristics of the socioeconomic and physical environment, while the micro approach explains individual migration behaviour within the framework of a psychological decision-making process'.

The same mechanisms operate in both internal and international migration. Migration is usually a response to labour market conditions, educational opportunities, family factors, or a desire to improve one's quality of life (Biagi, Faggian, & McCann, 2011; Thomas Niedomysl, 2011; Nivalainen, 2004). A dominant approach to understanding flows of people is based on neoclassical economic theory (Abreu, 2010; Arango, 2000; Lewis, 1954; Sjaastad, 1962). This theory states that labour migration is the result of the uneven geographical distribution of labour and capital and that migration is mostly motivated by economic reasons. Thus, people move to places where they have better access to jobs, services, housing, etc. In the neoclassical view, labour migration should eventually lead to a new (spatial) equilibrium (Sjaastad, 1962).

The neoclassical economic model has been questioned on a number of counts. It has been noted that economic motives and rational decisions are not the only concerns of

migrants. As stated by Blau and Duncan (1967, p. 244), 'men do not flow from places of poor to places of good opportunity with the ease of water'. Institutional (political) constraints, personal characteristics, migration networks (prior links between countries or individuals), the stage in the family life-cycle, and other factors, are no less influential in determining mobility or immobility. Migration is therefore multilayered and very complex in its nature. Different aspects of this complexity can be explained by deterministic, humanistic and biographical approaches (Ní Laoire, 2000). Contrary to the neoclassical economic model, alternative migration theories (e.g. the new economics of labour migration, dual labour market theory and world system theory) assert that migration usually reinforces inequality rather than leading to its reduction (Abreu, 2010; Arango, 2000; Fratesi & Percoco, 2014). Therefore, the process of migration typically leads to growing regional disparities in terms of population distribution and economic performance, characterised by an increasing gap between the 'winning' and 'losing' regions.

High levels of out-migration often have significant effects such as an ageing population and lower birth rates in the 'losing' regions. This is because it is mainly young people who move away (Elshof et al., 2014; Nugin, 2014; Sipavičienė & Stankūnienė, 2013). Another effect of out-migration is the 'brain drain', when more people who are highly educated move away and 'brain waste' when educated migrants enter low-skilled labour markets (Favell, 2008; Genelyte, 2017; Kazlauskienė & Rinkevičius, 2006; Kelo & Wächter, 2004). According to Fratesi and Percoco (2014), migration is often skill-selective: skilled people are most likely to relocate because they benefit most from migration. At the same time, the regions from which they come lose their human capital and eventually also their economic potential. Moreover, the initial migrant stream may encourage a second stream, with the first migrants followed by family and friends: this process is called 'chain migration', facilitated by a migration network (Boyle et al., 1998; Maslauskaitė & Stankūnienė, 2007). All of the discussed trends apply to CEE countries and in a large extent to Lithuania.

Although out-migration is often identified as a 'loss of human and social capital', the positive sides of migration are often forgotten (Stockdale, 2004). Mobile individuals can enjoy opportunities which would otherwise not be available to them. Experience and social contacts acquired abroad are often very beneficial in the country of origin if people return. Moreover, migration is a natural response to the lack of employment opportunities or job prospects, or to other structural changes in the economy.

The general trend in many countries is that people are moving from less urbanised to more urbanised areas, and from agricultural to industrial and service-led regions, resulting in metropolisation and peripheralisation of people and economy. While this is particularly characteristic of the post-socialist region (Lang et al., 2015), it can also

be found in many other countries. In this context, the case of Lithuania is of special interest, due to the unique city system that was formed in the socialist period. In Lithuania, planning policy focused on decentralisation and sought to limit the growth of the major cities. Consequently, rural-urban migration, which had long been the prevailing direction of migration in many countries, was restricted in Lithuania until the early 1990s. Therefore, previous restrictions on residential mobility should have been compensated by more intensive migration flows (internal and external) and population redistribution after the 1990s. Corresponding increases in the level of segregation and regional inequalities, respectively, should also have been more visible during recent decades. Thus, if we want to understand the processes of population redistribution and growing regional inequalities we need to gain more insight into internal migration. The role of selective mobility, with specific attention being paid to the rapidly declining regions, will be analysed in Chapter 3.

Suburbanisation

Suppressed urbanisation and rural retention during the Soviet period resulted in major changes in land use patterns after the introduction of the market economy in CEE countries (Bertaud & Renaud, 1997; Borén & Gentile, 2007). One of the most significant features was urban expansion through the process of suburbanisation (Kok & Kovács, 1999; Krišjāne & Bērziņš, 2012; Leetmaa & Tammaru, 2007; Novák & Sýkora, 2007; Nuissl & Rink, 2005; Ouředníček, 2007; Tammaru, Leetmaa, Silm, & Ahas, 2009). Like many other former centrally planned cities in Europe, Vilnius is also undergoing rapid suburbanisation – a process which started immediately after independence at the end of the 1990s (Brade et al., 2009; Cirtautas, 2013; Ubarevičienė et al., 2011).

Similar to many other Central and Eastern European cities, during the Soviet period, the hinterland of Vilnius was devoted exclusively to agriculture and associated industrial production. After the collapse of the Soviet Union, the introduction of a free market economy and privatisation liberated the previously constrained growth potential of Vilnius and allowed the city to expand very quickly. The attractiveness of suburban locations, in terms of natural environment and metropolitan potential (associated with jobs and facilities), drew growing numbers of people to the suburbs. Since the 1990s, the population in the suburban zone has increased by approximately 30,000 (+20%), while in the city the population has dropped by 40,000 (-7%) (Statistics Lithuania, 2017). The process of suburbanisation was loosely regulated from the start. Today the suburban zone can be characterised by the scattered, small-scale residential developments. The density of the suburban dwellings is high near to the borders of the city and rapidly decreases with distance. Suburban settlements can be

found in the rural areas as far as 40 km from the city centre (Ubarevičienė et al., 2011). It is worth mentioning that the expansion of the city of Vilnius, which is regarded as the economic motor of Lithuania, is influencing one of the least economically developed regions of Lithuania, historically dominated by ethnic Polish residents. The suburban zone is now a site of increasing interaction between the original residents, many of whom have a Polish identity, and newcomers, who are mainly of Lithuanian origin. The ethno-political effects of suburbanisation in the Vilnius region will be explored in the empirical results presented in Chapter 4.

The main trends in changing residential patterns in Lithuania can be summarised as follows:

- Soviet regional planning focused on decentralisation of the population and economic activities; the growth of the largest cities was supressed and the development of the regional centres enhanced.
- Since the 1990s, residential mobility has no longer been centrally regulated and the mobility opportunities of residents have increased.
- The general trend is that people are moving from less urbanised to more urbanised areas, and from agricultural to industrial and service-led regions, resulting in metropolisation and peripheralisation of people and economy.
- Suburbanisation of the residents from the major Lithuanian cities is one of the most significant features of socio-spatial development since the 1990s.

§ 1.3.3 Social segregation

Different people tend to inhabit different spaces, leading to spatial inequalities based on social differences. In other words, segregation occurs when two or more population groups occupy different spaces within the same city, region or country (Hiebert, 2009, p. 673). Segregation can take place on the basis of ethnicity, economic status, education, political preferences or any other social division. Usually, segregation refers to residential segregation, which is the degree to which two or more social groups live separately from one another within a specified geographical area (Massey & Denton, 1988). However, there are other types of segregation, such as at school (Owens, Reardon, & Jencks, 2016; Valenzuela, Belleï, & de los Ríos, 2014; Yang Hansen & Gustafsson, 2016) or in the workplace (Andersson, García-Pérez, Haltiwanger, McCue, & Sanders, 2014; van Ham & Tammaru, 2016). Massey and Denton (1988) point out that groups can be segregated in a variety of ways; for example, they may be evenly distributed throughout a certain area on one side of a city, or concentrated in a small space. Taking this variety into account, several indexes corresponding to different

aspects of spatial variation were adopted to measure levels of segregation (Massey & Denton, 1988). Different distributional characteristics may be associated with different consequences of segregation.

Research on social segregation started with the Chicago School (Burgess, 1928; Park, Burgess, & McKenzie, 1925) and since then it has received continuous scholarly and political attention (Musterd, 2005). Numerous studies have been performed to gain more insight into the drivers and effects of segregation (Burgers & Musterd, 2002; Cassiers & Kesteloot, 2012; Scarpa, 2015; van Kempen & Murie, 2009). According to Hiebert (2009, p. 673), 'segregation can arise from discriminatory forces outside a group and/or from the social organisation and predilections of the group itself'. Segregation can be voluntary and involuntary (van Ham, Tammaru, de Vuijst, & Zwiers, 2016). It has also been shown that patterns of selective mobility, as well as in situ changes, can reshape the population composition of neighbourhoods and thus influence the levels of segregation (Boschman, 2015; Musterd, Marcińczak, van Ham, & Tammaru, 2016). Selective mobility means that certain groups in the population move from one place to another and thus alter the composition of the two places. Meanwhile, in situ changes occur due to social mobility, for example, people might attain a higher occupational status but do not change their place of residence. Usually, both processes occur simultaneously. In addition, many other factors play a role in processes of segregation, including the housing market, the labour market, access to information, social networks and the welfare state (Aidukaitė, 2011; Musterd, 2005; Tammaru, Marcińczak, et al., 2016).

The consequences of segregation have been widely discussed by geographers and sociologists (Hiebert, 2009). A limited degree of segregation can sometimes be advantageous, as people benefit when they live close to similar people – for example, there may be increased social contact between neighbours – or a degree of segregation might help to increase a sense of safety, maintain cultural diversity and even promote entrepreneurship (Cheshire, 2007; van der Laan Bouma-Doff, 2007; van Ham et al., 2016). However, there are increasing concerns about growing levels of segregation and poverty concentration (Musterd et al., 2016). High levels of segregation may have implications for social stability, cohesion, the competitive power of cities, educational opportunities and achievements, increasing social unrest and deviant behaviour (Tammaru, Marcińczak, et al., 2016; Valenzuela et al., 2014; van Ham et al., 2016). Hiebert (2009, p. 673) has pointed out that 'segregated landscapes are both the result of inequality and also a mechanism for the reproduction of inequality'. One of these mechanisms is the neighbourhood effect (van Ham, Manley, Bailey, Simpson, & Maclennan, 2012), when, for example, a high concentration of poverty can lead to negative outcomes for individuals. Therefore, in many countries, especially in Western Europe, social mix policies have been introduced to reduce segregation processes (Cassiers & Kesteloot, 2012; Cheshire, 2007; Musterd, 2005).

Today, most attention is focused on segregation in the capital cities, and the majority of studies analyse either or both ethnic and socioeconomic segregation. Socioeconomic segregation refers to the spatial separation of population groups by occupation or income, while ethnic segregation is based on ethnic background. A relationship between these two forms of segregation has also been found to be important (Clark & Blue, 2004; Tammaru, Kährik, Mägi, Novák, & Leetmaa, 2016).

In CEE countries, more detailed studies on segregation have only started to emerge two decades ago (Kährik, 2002; Kovács, 1999; Sailer-Fliege, 1999; Sýkora, 1999). This may partly be explained by their socialist past and a lack of adequate data. While processes of segregation have been studied for almost a century in Western Europe, their findings provide little help in understanding segregation processes in CEE countries. This is particularly true in the case of ethnic segregation. At present, ethnic diversity in Western Europe can, in many cases, be regarded as a result of post-colonial processes, while ethnic diversity in CEE countries, especially in the Baltic countries, can mostly be deemed the result of colonialism. In the Baltic States during the Soviet period, rapid industrial growth was followed by immigration of Russian-speakers (mainly from Russia), which prompted a need for new housing that was instantly met in the form of high-rise multi-family complexes (Rybakovskiy & Tarasova, 1991). Ethnic minorities that immigrated to Baltic cities were in more favourable socioeconomic positions than people from the titular nations, which resulted in ethnic residential differentiation (Gentile & Tammaru, 2006; Kulu & Tammaru, 2003; Milstead, 2008; Ruoppila, 2004). These patterns of segregation have changed after the post-communist reforms were introduced and the position of national languages in public and institutional life was strengthened. However, a more recent study of Estonia has shown that the changes in residential differentiation of ethnic minorities 'have been too modest to overcome the inherited patterns of housing segmentation' (Hess, Tammaru, & Leetmaa, 2012).

Scholars generally agree that the socio-spatial structure was more homogenous in socialist cities compared to Western capitalist cities and that social segregation (income and ethnic inequality) has started to increase in CEE cities since the early 1990s (Marcińczak et al., 2015; Sýkora, 1999; Szelényi, 2001; Tammaru, Marcińczak, et al., 2016; Tsenkova, 2006). The main changes included the beginning of gentrification and suburbanisation processes, which resulted in the concentration of high-income groups in the most desired parts of the suburbs and inner-city (Brade et al., 2009; Kok & Kovács, 1999; Kovács, 1999; Sailer-Fliege, 1999; Sýkora, 1999; Szelenyi, 1996). While people with low socioeconomic status started to concentrate in the cheaper neighbourhoods in the outer-city (Krišjāne & Bērziņš, 2014; Marcińczak et al., 2015). In addition, Soviet-era large housing estates are becoming increasingly stagnant and unattractive for younger and more affluent people (Burneika, Ubarevičienė, & Valatka, 2016). Despite these trends, recent studies show that the

levels of socioeconomic segregation in many CEE cities remain relatively low compared to the western counterparts, although income inequality has grown considerably in the first decades after the demise of communism (Marcińczak et al., 2015; Tammaru, Marcińczak, et al., 2016). It is likely that income inequality will continue to increase. Furthermore, CEE countries might face greater consequences of rising inequality in the near future, because they do not have a strong social housing sector, or resources to deal with housing problems or social mix policy (van Kempen & Murie, 2009). In addition, according to Cortese and colleagues (2014, p. 2053), 'social cohesion is even more difficult to achieve in shrinking cities than in other cities because … [they] are overburdened with challenges but left with few(er) resources at hand.' Population decline modifies the demographic and socioeconomic composition of cities, affects job market, and results in abandoned infrastructure and housing (Cortese et al. 2014). These processes inevitably lead to poverty concentration in the most affected neighbourhoods of the declining CEE cities (Burneika et al., 2016; Cortese et al., 2014).

In Lithuania, studies that directly address social segregation and its spatial dimension have only recently started to appear. The studies by Krupickaitė (2014), Žilys (2013) and Tereškinas et al. (2013) were survey-based and the spatial dimension rather limited as a result. Research by Marcińczak et al. (2015) was based on the 2001 census data at the level of census tracts. This study compared the levels of segregation in CEE capital cities, including Vilnius. All of these studies found that the levels of segregation were relatively low in Vilnius and the other large Lithuanian cities. However, they did not investigate how the levels of segregation may have changed over time. The processes discussed in this introduction – suburbanisation, economic restructuring and professionalisation of the workforce, selective migration, etc. – lead us to expect increasing levels of segregation in Lithuanian cities, and particularly in Vilnius. The processes of socioeconomic and ethnic segregation and the change over time will be investigated in Chapters 5 and 6 of this thesis. Indeed, these Chapters will show that the levels of segregation are increasing in Lithuanian cities.

The main trends in social segregation in Lithuania can be summarised as follows:

- The processes of socioeconomic segregation were inhibited by the socialist system and became much more exposed in the market-led system.
- The Russian-speaking ethnic minorities were in a more favourable socioeconomic position than the Lithuanians during the Soviet period, but this changed after the 1990s.
- Earlier studies found that the levels of segregation were relatively low in Vilnius and the other large Lithuanian cities. However, they did not investigate how the levels of segregation have changed over time.

§ 1.3.4 Increasing regional inequalities

The processes presented above have different effects in different places and therefore lead to uneven socio-spatial development. During recent decades, socio-spatial inequalities have become increasingly apparent on the international, national, regional and local scales (Kühn, 2015). These inequalities involve economic, social, political and other dimensions and are usually produced by processes of centralisation and peripheralisation of people and the economy. The metropolitan regions continue to grow demographically and economically, while many of the other regions face a spiral of decline. This is reflected in the loss of jobs and enterprises and the reduction of social services in the latter, thus encouraging out-migration. It is believed that great spatial imbalances in the development of countries may threaten their social and economic stability (Ehrlich, Kriszan, & Lang, 2012; Hudson, 2015; Lang, 2011).

The first theories on regional inequality appeared in the 1950s. They emerged as a critical response to neoclassical theories which denied uneven development and assumed that differences across regions tend to diminish over time (Dawkins, 2003; Myrdal, 1957; Sjaastad, 1962). Inspired by neoclassical theories, the traditional model of regional development was based on location theories developed by W. Christaller (1933), A. Lösch (1940), J. H. von Thünen (1926) and others (Hudson, 2011). These theories attempted to explain the location of economic activities and demonstrate regional development processes in the industrial period. However, these location theories did not pay much attention to the emergence of uneven spatial development. For example, they assumed that the markets were perfectly competitive, the production technologies identical and labour and capital inputs homogeneous across regions (Dawkins, 2003).

In response, and in the context of increasing globalisation, liberalisation and technological progress, theories of regional economic divergence began to develop in the 1960s, and region-specific elements were introduced to explain uneven spatial development. Since then, space has started to be perceived through a diversified-relational lens (Capello, 2009). Among the theories of divergence are cumulative causation theory, developed by Myrdal (1957), and growth poles theory, developed by Perroux (1955). Both are highly applicable in explaining population decline and spatially uneven population change. More recent theories, developed after the 1970s (e.g. world-systems theory, network theory, new trade theory, territorial capital), also address regional inequalities and patterns of uneven development, but are less adapted to explaining the spatial development of particular regions or individual countries.

Over the past decades, interest in socio-spatial inequalities and the reason they develop has increased considerably (Dawkins, 2003; Hudson, 2005). Researchers from different disciplines (economics, geography, sociology, political science and others) are interested in processes that are fundamentally spatial in nature. A large body of theoretical and empirical literature has examined the causes of spatial inequality and considered its effects on society and the economy (Hudson, 2015). Most have concluded that a certain level of inequality is inevitable in a free market economy (Cassiers & Kesteloot, 2012; Dawkins, 2003; DeFilippis, 2017; Hudson, 2011; Smith & Timár, 2010). Furthermore, inequality seems to increase with economic growth and development (Kim, 2008). Qualitative as well as quantitative differentiation between places is often attributed to the capitalist economic model as well as Marx's theory on capital (Harvey, 1999). Most of the classic works, as well as more recent development theories, explain differentiation in relation to capital accumulation (Dawkins, 2003; Haas, 2007). Since capital tends to produce as well as to exploit spatial differentiation, uneven development becomes a cumulative and self-reinforcing process (Hudson, 2015; Myrdal, 1957). According to Kühn (2015), 'agglomeration provides a context to innovations, which in turn attracts more activities and reinforces the agglomeration'. Such agglomeration is to the disadvantage of non-metropolitan regions, which are increasingly left behind. The territorial agendas of nation-states, as well as the EU, see more balanced spatial development as a necessity, seeking to keep inequality within acceptable limits (Hudson, 2015). However, the agglomeration effect may not only be associated with negative consequences; the growth achieved by a particular territorial area may be beneficial for development on the national scale (Capello, 2009; Puga, 2010; Quigley, 2013). This may be manifest in several ways. For example, through the 'spillover effect', the creation of innovation, increasing economic efficiency, improvement in employment opportunities or participating in global competition.

In CEE countries, the contrast between the development of metropolitan regions and non-metropolitan regions is becoming increasingly pronounced (Kühn, 2015). In the 1990s, the capital regions started to attract economic and political interest, to the disadvantage of the rest of the regions (Lang, 2015). According to Ehrlich et al. (2012), the metropolitan regions can be called the 'winners' of these socio-spatial changes, while other areas in CEE countries have experienced adverse developments. The most radical demographic changes took place in the peripheral countryside regions, which have been losing population at the highest rates and experiencing profound changes in their demographic and socioeconomic composition. These regions are characterised by low population density, the predominance of employment in agriculture, and relatively large distances from the bigger cities (outer and inner peripheries of the countries). A significant drop in the importance of agriculture, which was prioritised under the communist regime (Enyedi, 1998; Leetmaa & Tammaru, 2007; Tammaru, 2001), has reduced the number of jobs in rural regions several times over and raised

the level of unemployment, thus leading to out-migration. The terms frequently used to describe these trajectories in recent socio-spatial development in CEE countries include metropolisation, centralisation, peripheralisation, polarisation, residential differentiation and segregation (see e.g. Gentile et al., 2012; Lang et al., 2015).

In Lithuania, the trends in socio-spatial development are similar to what can be observed in the other CEE countries (Borén & Gentile, 2007; Ehrlich et al., 2012; Gentile et al., 2012; Sailer-Fliege, 1999; Smith & Timár, 2010; Sokol, 2001). However, we can expect that the increase in regional inequalities was even more pronounced here. For decades, regional disparities in Lithuania were avoided by strict Soviet planning policy, which favoured the organised and uniform spread of the population and economic activity throughout the country. The transition to a market-led economy, strengthening domestic and international competition, processes of globalisation and social segregation, as well as other effects, created many challenges relating to the territorial structure that had been inherited. As it did not meet the needs of the post-socialist democratic society and market-led economy, it began to change. Previously controlled flows of internal migration changed direction, and many people moved to the larger cities or abroad. Most economic growth and demographic potential started to concentrate in a few metropolitan regions, particularly in Vilnius (Burneika & Ubareviciene, 2015; Cirtautas, 2013; Krupickaitė, 2014; Ubarevičienė & Burneika, 2015; Ubarevičienė et al., 2011). Many regions, whose growth had been stimulated during the Soviet period by providing jobs in low-tech industry, were suddenly unable to provide sufficient levels of employment and standards of living under the new political and economic system. After the collapse of the Soviet Union, most of the peripheral regions did not receive investment, and public as well as private service provision constantly declined in these regions. It is evident that such a situation would lead to out-migration, contributing to the further deterioration of living standards for the majority of the remaining population, insofar as there was even less likelihood of further investment in service provision or employment.

The findings of the literature review on regional inequalities in Lithuania can be summarised as follows:

- Regional inequalities in Lithuania have constantly increased since the 1990s.
- In the peripheral regions, many jobs were lost and unemployment increased, which resulted in out-migration.
- While in Soviet times the uniform spread of the population and economic activity was advocated, now most of the economic growth and demographic potential are concentrated in a few metropolitan regions, particularly in Vilnius.

§ 1.4 Gaps in current knowledge, aims and research questions

Most of the existing research on socio-spatial change in CEE countries has focused on political and economic restructuring. However, increasing attention is being paid to the spatial and social consequences of change, such as population decline, increasing regional disparities and higher levels of segregation. According to Stanilov (2007), due to the very rapid pace of change, the recent socio-spatial development in CEE countries can be seen as a perfect 'laboratory for observation'. The previous sections of this introduction highlighted that in recent decades Lithuania has been experiencing more profound socio-spatial transformations than other CEE countries. However, compared to these other countries, there has been relatively little research on the case of Lithuania. One of the main reasons for this has been the limited availability of data on Lithuania. This thesis seeks to fill some of these current knowledge gaps on socio-spatial change in Lithuania.

The knowledge gaps concern four issues: population decline, changing residential patterns, social segregation and increasing regional inequalities. Firstly, there is not much research on the socio-spatial development processes and their consequences in Lithuania. The existing research is focused on either natural population change (Kalėdienė & Sauliūnė, 2013; Stankuniene & Jasilioniene, 2008; Vlada Stankūnienė & Jasilionis, 2011; Stumbrys, 2016) or on the economic aspects of emigration (Genelyte, 2017; Klüsener et al., 2015; Sipavičienė & Stankūnienė, 2013). In addition, existing studies focus on the national level (Civinskas et al., 2011; Jasilionis, Stankūnienė, Maslauskaitė, & Stumbrys, 2015; Vladislava Stankūnienė, 2003) or municipal level (Klüsener et al., 2015) and lack a more detailed spatial focus. As a consequence, little is known about the specific drivers of population change and the regional variations within the country. Secondly, studies on internal migration, which is the driver of changing residential patterns, are particularly scarce in Lithuania (Ubarevičienė, 2016). Previous studies have used aggregated-level data on the municipal level (Juškevičius, 2015; Kuliešis & Pareigienė, 2011) and could therefore only investigate net migration. Little is known about the directions of migration flows within the country as a whole, or about the demographic and socioeconomic composition of these flows. Individual-level data is the most suitable for migration studies; however, until now individual-level census data was not available to socio-spatial researchers. Thirdly, research on social segregation is also scarce in Lithuania (the rare examples are Krupickaitė, 2014; Marcińczak et al., 2015; Tereškinas et al., 2013; Žilys, 2013). There are no previous studies investigating how the local spatial dimensions of social inequality have changed over time. Finally, greater attention should be paid to the increasing levels of socio-spatial inequality, which is the cause and the consequence of population decline, selective migration and segregation processes.

In summary, this thesis contributes to the existing literature by investigating population decline, migration patterns and processes of segregation in Lithuania. While the focus is on Lithuania, the results of this study are also of value for other CEE countries, many of which have experienced similar trajectories of change during recent decades. *The **aim** of this thesis is to gain more insight into the recent socio-spatial transformation processes and their consequences in Lithuania. The thesis investigates the main features and drivers of socio-spatial change in post-socialist Lithuania.* This aim has resulted in five empirical chapters, where each chapter presents different aspects of socio-spatial change.

Chapter 2: Shrinking regions in a shrinking country: The geography of population decline in Lithuania 2001-2011

This chapter serves as a starting point for the analyses of socio-spatial change in Lithuania. While most studies focus on specific cities and regions, much less is known about the spatial dimension of population decline on the national level and the regional factors determining spatially uneven population change. The aim of this chapter is to gain more insight into the geography of population change in Lithuania and to increase our understanding of the regional factors that contribute to population change. The main question raised in this chapter is: *What are the underlying reasons for the observed geographical pattern of population decline?* More insight into regional differences in population change and their drivers should contribute to the development of coping strategies and policies to deal with especially high population decline.

Chapter 3: Population decline in Lithuania. Who lives in declining regions and who leaves?

The goal of this chapter is to gain more insight into the recent processes of socio-spatial change and the role of selective migration in Lithuania. The patterns of population change in Lithuania show a concentration of the population in the metropolitan areas and a sharp decline in peripheral rural regions. Internal migration plays a major role in the processes of population redistribution and growing spatial imbalances. However, little is known about the direction of migration flows within Lithuania or the demographic and socioeconomic composition of these flows. Knowing that migration tends to be selective by nature, it can be expected that the population leaving declining regions in Lithuania is also very selective. Extreme population decline in some regions of Lithuania and the growth of population in others can be expected to result in residential differentiation. This chapter addresses the following research questions: *Who live in the rapidly declining regions? Who are most likely to leave such regions?*

Chapter 4: Ethno-political effects of suburbanisation in the Vilnius urban region: An analysis of voting behaviour

One of the most significant features of socio-spatial development in Lithuania is the urban expansion of Vilnius city through the process of suburbanisation. The suburban zone of Vilnius is a site of increasing interaction between the original residents, many of whom have a Polish identity, and newcomers, who are mainly of Lithuanian origin. A confrontation of ethnic groups with partly different needs, priorities, worldviews, quality of life standards and value systems might cause ethnic tensions in the suburbs. The research question of this chapter is: *What are the consequences of suburbanisation for voting behaviour in the surrounding Vilnius region?* We hypothesise that the number of votes for the Polish party and voting turnout will increase in the suburban ring due to the mobilisation of Poles, aiming to strengthen their political influence during a period in which others are moving to the region. The changing electoral behaviour might be an indicator of growing ethno-political tensions, and the zones of the most intense change could identify areas of potential social tensions between ethnic groups.

Chapter 5: Large social inequalities and low levels of socioeconomic segregation in Vilnius

The political-economic reforms in the 1990s resulted in a changing occupational structure and an increase in socio-spatial inequality in Lithuania. Vilnius is playing an increasingly important role in the organisation of society and the economy of the country; thus, the processes of socio-spatial segregation are the most intensive here. The aim of the chapter is to gain more insight into recent socioeconomic segregation processes in Vilnius. The chapter addresses the following three research questions: *How has the occupational structure of the population of Vilnius city changed between 2001 and 2011? Do we find evidence of increasing or decreasing levels of occupational segregation in the 2000s following the growth of social inequality since the 1990s? How do the segregation processes vary between the city zones?*

Chapter 6: Socio-ethnic segregation in the metropolitan areas of Lithuania

If Chapter 5 focuses on socioeconomic segregation in Vilnius, Chapter 6 addresses socio-ethnic segregation in three major metropolitan areas in Lithuania. One of the specific features of many post-Soviet cities is their multi-ethnic structure, which was strongly influenced by internal migration within the Soviet Union. We assume that the ethnic landscape inherited from the Soviet period started changing after free-

market forces began playing their role. However, the question remains *whether spatial residential differentiation has started to disappear or, on the contrary, is increasing*. This article seeks to gain more insight into the interrelationships between social and ethnic residential differentiation in three major metropolitan areas of Lithuania formed by the cities of Vilnius, Kaunas and Klaipėda. We seek to learn whether different ethnic groups can be associated with different socioeconomic statuses and whether these groups tend to occupy different urban spaces.

§ 1.5 Data

Ideally, one would have access to longitudinal geo-coded individual-level data to study patterns of socio-spatial change. Such data is only available in a few countries, such as the Netherlands, Sweden, Finland and the United Kingdom. Among CEE countries, Estonia has the most advanced data infrastructure, as researchers have been able to link the 2000 and 2011 Estonian censuses on the individual level, while currently there are plans to also link the final Soviet-era census to the data. This latest development would expand the already unique Estonian database, which would allow researchers to gain more insight into population development at the crossroads of the socialist and post-socialist systems.

One of the challenges encountered when doing research on Lithuania for this thesis was limited data availability. In Lithuania, as in most CEE countries, the most important and reliable source of data is from the 2000/2001 and 2011 population censuses, sometimes supplemented by surveys or register data. Although there were also censuses before 2000, the availability of such data is very limited. Most of the data gathered during the socialist period was in the possession of political-administrative institutions and considered secret. In addition, part of it was lost during the reform period.

Most of the research in this thesis is based on the 2001 and 2011 Lithuanian censuses. At the start of this project, data availability was limited to cross-sectional aggregated data on the municipality or ward[9] level. However, as the project progressed, access to more detailed spatial level data (census tracts) and, eventually, also individual-level geo-coded data, was obtained. As a result, this thesis is the first study to use individual-

9 Equivalent to Local administrative units (LAU 2 level) in the EU member states.

level Lithuanian census data in socio-spatial research.[10] Access to this data made it possible to study processes of spatial mobility on a very small spatial scale. This new individual-level data is an important research tool for Lithuania and opens up new possibilities for future research. Although the data for the 2001 and 2011 censuses are not linked at the individual level, this might occur in the future, as was the case in Estonia, opening many more opportunities to learn about the processes occurring in Lithuania. In addition to the census data, this thesis has also used electoral data to illustrate the ethno-political effects of suburbanisation (Chapter 4).

Census data, which includes the whole population, is the most reliable source of information for the analyses of socio-spatial change in Lithuania. However, census data typically has some shortcomings. First of all, the population census is only conducted every ten years. In addition, it takes several years for the collected data to be processed and systematised, and thus available for use in research. Thus, studies based on census data use relatively 'old' data. Additional issues arise when investigating migration processes. Firstly, Lithuanian census data from 2001 and 2011 only captures a change of residence in the one-year period before the census date. It records the current place of residence and the previous place of residence if the person has moved inside Lithuania, but the exact timing of the migration cannot be observed. Secondly, information on individual characteristics is only available for the census date. This implies that we only know the characteristics of movers after the move but not before. Therefore, the effects of time-varying variables such as education, occupation and household status should be interpreted with caution. Thirdly, census data in Lithuania does not provide information on intra-urban or intra-rural migration: only those moves in which the boundary of a city municipality or ward (LAU 2 region) was crossed have been recorded. Fourthly, census data does not contain any information on the reasons or motives for internal migration. Finally, both of the Lithuanian censuses (2001 and 2011) were conducted in post-crisis periods, which may have temporarily affected the directions of internal migration flows. All studies using census data suffer from similar problems, no matter the country (Leetmaa & Tammaru, 2007; Nivalainen, 2004; Sjöberg & Tammaru, 1999; Tervo, 2000), and it is important to be aware of these issues when discussing study results.

10 There are demographic studies that use individual-level data, but they do not have a more detailed geographical dimension (e.g. Klüsener et al., 2015).

§ 1.6 Outline of the thesis

The rest of this thesis consists of five empirical chapters followed by the conclusion. Different chapters analyse different aspects of socio-spatial changes, but together they illustrate the complexity and unusually rapid pace and scale of the post-socialist transformations in Lithuania. Chapter 2 and Chapter 3 are focused on Lithuania as a whole. The remaining chapters are focused on areas where the socio-spatial transformations are the most intense – the metropolitan regions and in particular the Vilnius metropolitan region. Chapter 4 discusses suburbanisation in Vilnius and related ethno-political effects. Chapters 5 and 6 analyse processes of social segregation in Vilnius and two of the other largest cities in Lithuania. Chapters 2, 3, 4 and 6 have already been published in peer-reviewed journals. Chapter 5 was published as a book chapter. The conclusion briefly summarises the empirical chapters, reflects on the main research findings, discusses the limitations of the thesis and provides directions for future research.

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2 Shrinking regions in a shrinking country: The geography of population decline in Lithuania 2001-2011

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Abstract

Shrinking populations have been gaining increasing attention, especially in postsocialist East and Central European countries. While most studies focus on specific cities and regions, much less is known about the spatial dimension of population decline on the national level and the local factors determining spatially uneven population change. This study uses Lithuanian census data from the years 2001 and 2011 to get insight into the geography of population change for the whole country. Lithuania has experienced one of the highest rates of population decline in the world in the last decades. The predictive models show that regional factors have a strong effect on the variation in population change throughout the country but also reveal that sociodemographic and economic area characteristics play a role in the process of decline. Our results give little hope to those who would like to reverse the ongoing trends of population change and emphasize the need for spatial planning to cope with the changes. This is an approach which currently does not exist in practice in Lithuania.

Keywords

Population decline; shrinking regions; postsocialist transition; suburbanization; Lithuania

§ 2.1 Introduction

Recently, there has been a wide interest in shrinking cities and regions[11] all over the world. Population decline has consequences for the economic base, labour market, housing market, and the social and technical infrastructures of regions. These consequences are especially severe in the postsocialist states of Central and Eastern Europe (CEE), which experienced some of the highest levels of population loss in the world during the last decades (Haase, Athanasopoulou, & Rink, 2016; Haase, Bernt, Grossmann, Mykhnenko, & Rink, 2016; Hospers, 2012; United Nations, 2015). This loss was conditioned by the profound political, economic and social transformations related to the demise of the Soviet Union at the end of the Nineteen Nineties. The deep economic recession, belated de-industrialization, decline in fertility rates, and massive (job-seeking) out-migration all resulted in a significant population loss in the CEE countries.

Lithuania is one of the leaders in terms of the population decline in the postsocialist region and in the world in general. According to census data, in the period between 1989 and 2011 the country has lost 17.2% of its residents, and the population drop was accelerating over time. The population of the country was just above 3 million in 2011. The broad tendencies of population change are already well known, but the specific drivers of change, and the regional variation within countries have not received much attention in the literature, which often focusses on specific cities or regions. Studies which take a national outlook (Cawley, 1994; Collantes, Pinilla, Sáez, & Silvestre, 2013; Haartsen & Venhorst, 2010; Kupiszewski, Durham, & Rees, 1998; Müller & Siedentop, 2004; Panagopoulos & Barreira, 2012; Wiechmann & Pallagst, 2012) usually limit analysis to particular aspects of decline and do not analyse a broader set of local factors determining spatially uneven population change. In this paper, we argue that uneven population change, with extreme population decline in some areas and a population increase in others, is the outcome of a certain combination of regional characteristics. Therefore, in order to explain the geography of population change, a national level perspective should be employed, which helps to understand the underlying processes and the spatial relationships between them.

The aim of this paper is to get more insight into the geography of population change in Lithuania and to increase our understanding of the regional factors, which contribute

11 In this paper we use term 'shrinkage' to indicate the process of a considerable and constant population loss. The term is also used to indicate employment decline or economic downturn (Hoekveld, 2012; Reckien & Martinez-Fernandez, 2011). We use terms 'shrinkage' and 'population decline' interchangeably in this paper.

to population change. More insight in regional differences in population change and their drivers will help to design coping strategies and policies to deal with especially high population decline. The case of Lithuania will also provide insights for other countries and regions dealing with the effects of population decline. This study uses Lithuanian census data from 2001 and 2011, aggregated in small regions (*seniūnija* corresponding to LAU2 statistical regions). Linear regression models were used to model population change of regions from a set of variables, including geographic, social, demographic, and economic characteristics.

§ 2.2 Literature review on population decline

Haase et al. (Haase, Bernt, et al., 2016) argue that 'the causes of shrinkage are as varied as they are numerous'. Population decline has proved to be a complex and multi-faceted phenomenon, which is highly dependent on political, economic, and social conditions, and therefore inconsistent and usually difficult to predict.

There are two main demographic trends associated with population decline: natural decline and negative net migration. These two trends are closely related and may even accelerate each other. Since spatial variations in births and deaths are generally only small (at least on the national level), most of the population change can be attributed primarily to net migration (Boyle, Halfacree, & Robinson, 1998, p. 45; Martí-Henneberg, 2005). A dominant approach towards understanding flows of people is based on neoclassical economic theory (Abreu, 2010; Arango, 2000; Lewis, 1954; Sjaastad, 1962; Stark & Bloom, 1985). This theory states that labour migration is the result of uneven geographical distribution of labour and capital, and that labour migration is mostly motivated by economic reasons measured by difference in wage levels. Therefore, people generally flow from high-unemployment to low-unemployment regions and from low-wage to high-wage regions. In the neoclassical view, labour migration should eventually lead to a new (spatial) equilibrium of wages (Sjaastad, 1962).

Despite the success of the neoclassical economic model, it has been questioned on a number of counts. It is being noted that economic motives and rational decisions are not the only concerns of migrants. As stated by Blau and Duncan (Blau & Duncan, 1967) 'Men do not flow from places of poor to places of good opportunity with the ease of water'. Institutional (political) constraints, personal characteristics, migration networks (prior links between countries or individuals), stage in the family life-

cycle and other factors are no less influential in determining mobility or immobility. Migration is therefore multi-layered and very complex in its nature. Different aspects of this complexity are being explained by deterministic, humanistic and biographical approaches (Ní Laoire, 2000). The alternative migration theories (e.g., the new economics of labour migration, dual labour market theory, world system theory) assert that migration usually reinforces inequality instead of leading to its reduction (Abreu, 2010; Arango, 2000). Therefore, the differentiation between the migration origin and destination regions (and countries) appears to result in the concentration of people and economic resources in some places and to a decline in other places. Similar mechanisms of increasing regional disparities are also highlighted by regional growth and local development theories (Capello, 2009).

One of the biggest sources of migrants in Western Europe in the last two decades is the postsocialist countries. The reforms in the 1990s opened the borders and lifted restrictions on mobility, causing a massive outflow of people from these countries. Since the movement of people was highly regulated during Soviet times, even within the national borders, the political reforms liberated residential mobility and enabled people to emigrate. The opening of the borders resulted in an increasing migration flows from the postsocialist countries, partly fuelled by an economic recession and high levels of unemployment in these countries. The emigration especially speeded up after the Eastern enlargements of the EU in 2004 and 2007 when many CEE countries became a legal part of the EU; and therefore residents could easily exploit better job opportunities in Western Europe (Kahanec, Zaiceva, & Zimmermann, 2010).

High levels of out-migration are often followed by side effects such as an ageing population and lower birth rates in the 'losing' regions. This is because mainly young people move away and the ageing population is left behind. The initial migrant stream may encourage a second stream, when first migrants are followed by family and friends: this process is called 'chain migration' facilitated by a migration network (Boyle et al., 1998, p. 36). Another side effect of out-migration is so-called 'brain drain', when higher educated people move away (Favell, 2008; Kazlauskienė & Rinkevičius, 2006; Kelo & Wächter, 2004). All of these effects are rather common in the CEE countries, and in many of these countries, the population decline is not limited to a decline in certain regions or cities but affects whole countries. The underlying process is one of 'cumulative causation' processes (first developed by Myrdal (Myrdal, 1957)), which means that once a negative development in an area has started, it is reinforced and thus leads to cumulative effects that make the situation even worse.

There may be many factors resulting in a spatially uneven population change on the national level. Notwithstanding that studies which investigate population decline in all regions in the country are relatively rare, in most cases they only focus on specific

factors determining population change. For example, there are studies which mainly emphasize geographical factors. The relationship between population change and size of place (in terms of population) has been explored by Cawley (Cawley, 1994). It was found that high rates of population decline positively correlates with the small size of places. Other authors have found relationships between population change and population density (Kupiszewski et al., 1998). The impact of the distance to cities and selected urban centres on the spatial pattern of population change was analysed by Niedomysl and Amcoff (Niedomysl & Amcoff, 2011) and Westlund and Pichler (Westlund & Pichler, 2013). These studies showed that peripheral countryside areas had the biggest losses of the population, while metropolitan-adjacent areas experienced expansion. A series of studies pointed out that the surrounding areas of the major cities have the highest potential for population growth and in many countries, especially in CEE countries, these are the only areas gaining population nowadays (Borén & Gentile, 2007; Gentile, Tammaru, & van Kempen, 2012; Nuissl & Rink, 2005; Schmidt, 2011; Sýkora & Ouředníček, 2007; Ubarevičienė, Burneika, & Kriaučiūnas, 2011). Apart from the locational factors, many authors found a relationship between population change and various socioeconomic characteristics of regions and cities. Age structure of the population is one of the most widely discussed factors which influence uneven population change. The age structure reflects the potential of the labour market and the reproductive capabilities of the population. Selective migration of specific age groups often results in an aging rural population and intense population decline (Burholt & Dobbs, 2012; Walford & Kurek, 2008). Meanwhile, family-driven suburbanization directed towards the peripheral areas outside the main cities leads to a younger age structure in these areas (Kroll & Kabisch, 2012). Younger age groups are also more frequently found in inner city areas, which are more viable in terms of economic and cultural life. In line with the neoclassical economic model, many authors emphasize that job and educational opportunities are the most important drivers of migration (Ní Laoire, 2000; Stockdale, 2004). The other factors identified are average incomes, educational level of the population, size and structure of labour market, rate of unemployment, number of enterprises per capita, and level of foreign investments (Niedomysl, 2008; Schmidt, 2011; Tammaru & Sjöberg, 1999; Westlund & Pichler, 2013).

Population decline in postsocialist countries

The massive population decline in the Central and Eastern European (CEE) countries can only be understood within the historical contexts of these countries. From 1945/50 to 1989/91[12], CEE countries were under communist Soviet regime and subject to a command economy model, which was based on the principles of central planning. The countries were isolated from the rest of Europe, with the Iron Curtain as the symbol of the ideological conflict between communism and capitalism. The communist states had very limited relations with the outside world and for most people it was impossible to cross the Iron Curtain. Population movement was also regulated between the communist states and even within the national borders. The communist regime had a strong influence on the spatial distribution of human and economic resources. According to Gentile and colleagues (Gentile et al., 2012), there was an intention to 'annihilate social, economic and regional differences and inequalities, effectively pushing for complete social, economic and spatial homogenization over time'. The communist planning doctrine even extended to controlling the size and hierarchy of cities and aimed at a more even spread of population, without having a dominant city (Bertaud & Renaud, 1997). Even though spatial planning was quite successful, countervailing forces and the reality of the urbanization process did not allow urban planning to achieve this ultimate goal (Bater, 1980; Huzinec, 1978). Some cities were growing much faster than was expected and spatial as well as social disparities remained (Musil, 2005). Although there were variations between CEE countries in terms of the adaptation of communist ideologies, the communist period had a strong impact on the sociospatial organization of these countries and resulted in very different development paths compared to Western European countries.

The collapse of the communist regime in 1989/91 resulted in a new stage of sociospatial development in the region (Musil, 1993; Sailer-Fliege, 1999; Smith & Timár, 2010; Sýkora, 1999). The combined effects of major economic, social, demographic, and political transitions in the last two decades have resulted in large scale emigration and natural population decline, which caused the sociospatial landscape of CEE countries to change in a fast and dramatic way (Stryjakiewicz, Ciesiółka, & Jaroszewska, 2012). While emigration was fostered by the economic recession in the CEE countries and the new possibilities to search for better opportunities (job, education, quality of life, etc.) abroad, the natural decline was prompted not only by the reforms themselves but also by the sudden impact of the

12 The period of the socialism lasted differently in different CEE countries.

second demographic transition[13]. The population decline appeared to be so sudden that some demographers have named it the 'demographic shock' (Eberstadt, 1994; Rychtaříková, 1999; Sobotka, Zeman, & Kantorová, 2003; Steinführer & Haase, 2007). It is interesting that the population loss in most of the CEE countries was accelerating over time, and it was considerably higher in the second decade of the transition period than in the first one. In many countries it can be explained by an increase in (job-related) emigration, which was enhanced after the accession of many CEE countries to the EU (Kahanec et al., 2010). The abolition of political, economic, social, cultural, and psychological barriers and widening social networks abroad contributed to the increasing emigration over time. The fact that younger people are overrepresented among those who left will result in further natural population decline as the population ages while fertility drops.

Despite the general population decline in CEE countries, there is an increasing concentration of people in the major city-regions since 1990s (Borén & Gentile, 2007; Nuissl & Rink, 2005; Sýkora & Ouředníček, 2007), although inner cities themselves also face a declining population (Steinführer & Haase, 2007). Rural regions have seen the most extreme population decline because of the reduced importance of agriculture, which was prioritized under the communist regime (Enyedi, 1998; Leetmaa & Tammaru, 2007; Tammaru, 2001).

Postsocialist transition in Lithuania

Lithuania, Latvia and, Estonia were a legal part of the Soviet Union during 1940-1990/1991[14], were the Soviet principles of central planning were imposed consistently (Aberg, 2005; Borén & Gentile, 2007). The transition period was very sudden from being fully incorporated into the 'self-enclosing' communist system to full exposure to the global economy. Since the very beginning of the postsocialist period the Baltic States encountered major difficulties in reorienting their economies. This economic shift meant that the Baltic States changed their position from relatively affluent and prosperous region in the Soviet Union to the poor periphery of the European Union. The transition period was accompanied by a sharp population decline, which showed one of the highest rates of decline in the world between 1989 and 2011 (Berzins & Zvidrins, 2011).

13 The second demographic transition is mostly characterised by postponing marriage, increased proportion of adults living alone or cohabiting, increased fertility outside of marriage, and delaying or forgoing childbearing, which usually leads to rates of fertility below replacement levels and population ageing (Mayhew, 2015).

14 Lithuania, Latvia and Estonia were incorporated into the Soviet Union under the pact of the Molotov-Ribbentrop in 1940. Lithuania gained independence in 1990 and Latvia and Estonia in 1991.

The recent trends of sociospatial developments are similar between the three Baltic States, where decline of the rural areas and growth and spread of the metropolitan regions are the main features (Cirtautas, 2013; Krupickaitė, 2003; Vanagas, Krišjane, Noorkoiv, & Staniūnas, 2002). On the other hand, the transition period appeared to have different effects on the change of the sociospatial organization of Lithuania compared to the other Baltic States. This was due to the fact that during the Soviet period the unified settlement planning was implemented on a greater extent in Lithuania compared to the other Baltic States. This planning system was based on strengthening the development of regional centres and reducing the dominance of large cities, and it was done through housing and employment policy (people used to live and work in the places where they got assignments) (Bater, 1980; Šešelgis, 1996; Sýkora & Čermák, 1998). In Lithuania, this meant that part of the potential growth of the few larger cities was distributed to other regions of the country, and thereby a polycentric urban system was created. Meanwhile, the urban systems in Latvia and Estonia remained purely monocentric over the Soviet times and thereafter.

The transition to a market led neoliberal economy resulted in a new stage of sociospatial development in Lithuania. Many regions whose growth has been stimulated during the Soviet period became unable to provide sufficient level of employment and standards of living under the new competitive economic conditions. Moreover, after the 1990s the distribution of the population was no longer regulated, and, as a result, the residential patterns started to change. Personal and economic motives of individuals have replaced the communist planning doctrine and became the most important factors influencing population change. Population started to concentrate into the major city-regions, especially in Vilnius. The urban system of Lithuania is evolving into a model where the capital city is dominating, which is typical for the other Baltic States as well.

Under the communist regime without market competition, and in a society with no significant economic and social differences, the Soviet-made territorial organization of Lithuania performed relatively well and was perceived as an achievement of Soviet urban planners (Vanagas et al., 2002). However, the transition to a market led neoliberal economy, strengthening domestic and international competition, processes of globalization, social segregation, and other effects raised a lot of challenges for the inherited territorial organization in Lithuania. This is confirmed by very high rates of international and internal migration, shrinkage of urban and rural areas, intense suburbanization of major cities, and by other urban processes. However, even under such circumstances, the growth oriented development paradigms are still dominant in Lithuania, and planning for decline seldom appears on the agendas of planners and politicians. There is no strategy on how to cope with population change and no dialog exists between politics, planners, and researchers to discuss possible

scenarios for the future. This paper could serve as a starting point for such discussions, describing and explaining the present pattern of population change and evaluating the importance of regional factors in uneven regional development.

§ 2.3 Data and methods

This study uses aggregated data on the low spatial level of *seniūnija* (corresponding to LAU2 statistical regions) from 2001 and 2011 Lithuanian censuses. There were 546[15] spatial units covering Lithuania: 82 of them are classified as urban areas, and the rest are classified as rural areas. The average size of rural *seniūnija* is 135 km^2, with approximately 2820 inhabitants in 2001 and 2470 inhabitants in 2011. The average size of the urban *seniūnija* is 17.4 km^2, with 26,300 inhabitants in 2001 and 20,360 inhabitants in 2011. Since not all of the required data are provided by the censuses, we also used data from Statistics Lithuania, which were only available at the level of the 60 Lithuanian municipalities.

In the descriptive part of the results, we discussed the spatial pattern of population change between 2001 and 2011 in Lithuania. Next, we used linear regression to model population change and to explore the relationship between the rate of the population change (dependent variable) and various territorial characteristics (independent variables). By using linear regression, we were able to test the predictive power of a set of variables and to assess the relative contribution of each variable on the process of population change (Pallant, 2011). Based on a simple regression model with only locational characteristics, we constructed further models in order to find out the underlying explanations for the geographical pattern of population change[16]. The following models contain theory guided variables measuring sociodemographic and socioeconomic characteristics of regions. We used data from 2001 as baseline characteristics. Not all variables considered were reported in the main regression models, because in the preselection process it was found that their influence was negligible. The variables we used can be categorised into locational, sociodemographic

15 In Fact, there were 549 of such administrative-statistical units in 2011. Because over time the spatial borders of some *seniūnija* changed and because we wanted to clearly distinguish urban and rural areas, we had to make some adjustments by combining and separating some units.

16 All the variables were checked for multicollinearity, and there were no risk of that. The models were also checked for collinearity statistics (tolerance, VIF) and there were no violations detected.

and socioeconomic characteristics. We used this distinction in our models. We presented the results of the regression models in tables as well as in maps in which we show the unstandardized predictive values (values that the regression model predicts for the dependent variable when a certain set of independent variables is included) and residuals (the actual value of the dependent variable minus the value predicted by the regression model).

It has to be mentioned that due to the data limitations we could not make the distinction between population change caused by natural change and by net migration. More detailed information would have provided a better understanding of the drivers of change and the role of various local factors. On the other hand, the analysis on the municipal level showed that population change has a high correlation (r=.88) with net migration ratio; thus we can assume that most of the variations in the population change are caused by migration (both internal and outward).

The locational characteristics require some additional explanation. We started using a simple urban-rural distinction to replicate the existing spatial pattern of population change. By using this variable, we aimed to examine how well spatial variation in population change can be explained by an urban-rural distinction. Using dummies we coded all the spatial units into one of the following categories: (1) three largest cities; (2) area within 15 km distance from one of the three largest cities; (3) other cities; (4) area within 15 km distance from a medium city (county capital); (5) area within 15 km distance from a smaller city (municipal capital); reference category – the remaining areas or areas further than 15 km from the cities. During the initial analysis of the data, we observed that the medium and smaller cities had the same rates of population change (decline), and, to limit the number of variables included, we grouped them into the same category. The regions around medium and smaller cities, however, varied in terms of population change. Detailed variable summary statistics for all included variables can be found in Table 2.1.

	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
Percentage population change, 2001-2011	-41.70	90.90	-14.047	14.041
Urban – rural distinction[a]				
3 largest cities[b]	0	1	0.06	0.235
Areas within 15 km from 3 largest cities	0	1	0.10	0.306
Other cities	0	1	0.09	0.289
Areas within 15 km from medium cities	0	1	0.09	0.281
Areas within 15 km from smaller cities	0	1	0.32	0.466
Seniūnija-level variables				
Mean age in years, 2001	28.37	52.69	39.209	3.168
Percentage working-age (15-64) population, 2001	47.47	79.18	61.78	4.953
Percentage households with children, 2001	13.79	54.56	36.291	6.850
Percentage Lithuanian ethnic group, 2001	2.29	99.92	87.206	23.715
Percentage university education, 2001	8.71	44.18	20.419	6.714
Percentage of employed, 2001[c]	23.22	74.52	47.472	8.441
Percentage joblessness, 2001[c]	2.96	36.47	14.298	5.706
Percentage of employment in 2001 in:[d]				
• Primary sector	0.99	80.82	35.226	20.037
• Industry and construction sector	1.22	49.14	17.921	9.663
• Traditional service sector	3.86	39.46	14.414	6.434
• Business service sector	1.88	42.86	9.297	4.323
• Public administration	5.24	53.42	20.348	6.790
Percentage of high-ranking occupation[e], 2001[d]	4.87	50.26	15.822	6.913
Percentage of receiving social benefits, 2001[c]	2.36	15.78	7.566	2.497
Municipal-level variables				
Average wage, 2001 EUR	195.78	488.30	239.413	50.324
Foreign invest. per capita (EURm), sum 2001-2011	0.01	126.56	9.3022	23.082
Number of economic entities[f] per 1000 person, 2001	7.60	67.50	15.227	4.751
Number of social dwellings per 1000 person, 2003	0.17	35.62	2.1328	1.8753

[a] *Reference = rural areas further than 15 km from the cities.*
[b] *In three largest cities, there are 32 research areas.*
[c] *From the working-age population.*
[d] *From the employed population.*
[e] *The high-ranking occupation group includes managers and professionals (according to the International Standard Classification of Occupations).*
[f] *An economic entity can be any organization or unit in society including state-owned companies, municipal enterprises, private and public companies, associations, and charity organizations.*

TABLE 2.1 Variable summary statistics – 2001 and 2011
Source: Lithuanian census data and Statistics Lithuania (N = 546)

§ 2.4 Results

Descriptive results of population decline in Lithuania

According to the censuses, in the period between 1989 and 2011, Lithuania lost 17.2% of its population. The actual loss could be even higher, because a lot of emigrants do not declare when they leave the country (Civinskas, Genys, Kuzmickaitė, & Tretjakova, 2011). The population decline was almost three times more intense during the second decade of the postsocialist transition period compared to the first one which can be seen as a sign of the delayed consequences of the transition. The spatial pattern of population change between 2001 and 2011 is illustrated in Figure 2.1. The map shows that the range of the population change varies a lot across Lithuania, with some areas almost doubling their population (+91%), while other areas lost close to half of their population (-41%) during the same period[17]. The map clearly shows that the population decreased almost everywhere, except in the areas around the largest cities, where metropolitan growth through suburbanization is taking place since the early 1990s. The sharpest decline in population can be observed in rural areas located further from the cities. 41% of the country's area (in km^2) lost more than 20% of the population during the last decade and only 6% of the country's area did not experience a drop in population. The main reason of population decline in Lithuania was emigration, which accounted for 80-90% of the population loss (Civinskas et al., 2011; Statistics Lithuania, 2012). On the other hand, natural decrease was also high and the total fertility rate in Lithuania was among the lowest in Europe, reaching 1.29 in 2001, although it soon started to increase and converged to the average of the EU in 2012 (1.6) (Eurostat, 2016).

17 In reality, the contrast in the spatial pattern of the population change is higher, because people do not always report the change of the residence. Taking into account the dominant destinations of inner migrations, the residents in the rural areas are more often overrepresented, while residents in the metropolitan areas are under-represented.

If we want to understand the population change as we see it in the map in Figure 2.1, we need to look at the underlying factors. The geographical pattern of population change suggests that certain regional characteristics have a strong effect on the variation in population change throughout the country. Based on the map, we expect that locational factors, which we summarise in an urban-rural classification, will be one of the most important factors in explaining population change, even after controlling for other area characteristics. The distance from major cities also seems to play an important role: areas near larger cities experience population growth and areas further away from cities generally experience a strong decrease in population. Underlying the spatial pattern are also sociodemographic and economic characteristics. Population decline is likely to be highest in those regions with a low percentage of working-age population, a low percentage of households with children, and high levels of unemployment. The spatial pattern of population decline can also be expected to be influenced by the educational level of the population and structure of the labour market. Population is likely to increase in areas with higher share of higher educated people and in areas with increasing employment in the service sector but will decrease in areas with a high percentage of employment in the primary sector (agriculture). In addition, we expect that those areas which receive the highest levels of foreign investments will show a lower decrease in a population.

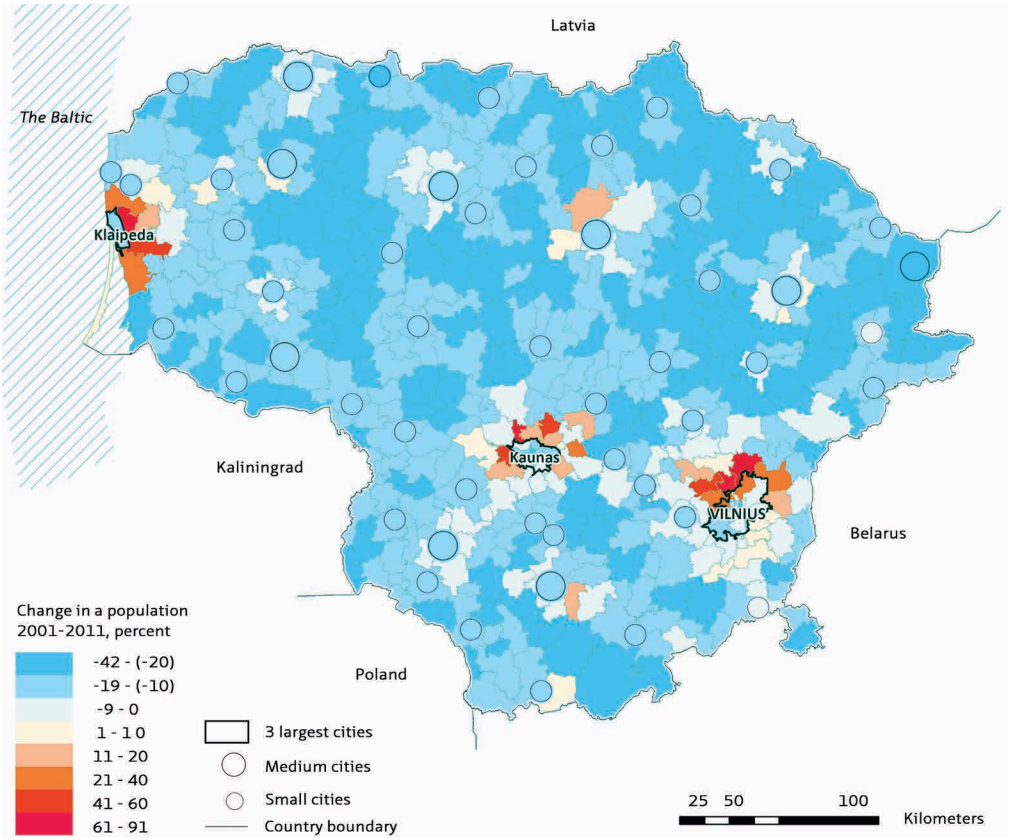

FIGURE 2.1 Population change in *seniūnija* in 2001-2011
Source: own calculations based on the 2001 and 2011 Lithuanian census

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Modelling population change in Lithuania

In order to better understand the causes of the existing spatial pattern of population change, we employed linear regression to model the effect of different territorial characteristics on population change at the level of *seniūnija*. Table 2.2 shows the results of five models of population change. In model 1, we only included an urban-rural classification, with rural areas as the reference category. This simple model already explains 43% of all variation. The results show that the territories around the largest cities are the only areas gaining population. Although the three largest cities themselves are actually losing population, the average rate of this decline is slower than in the other places. The areas around medium-sized cities stand out by the smaller population drop compared to the cities they surround, while the areas around smaller cities show a higher level of population decline. The predicted values of model 1 are mapped in Figure 2.2. Comparison of this map with the map in Figure 2.1 shows how well the model performs. The modelled spatial pattern shows that the urban-rural distinction, city size, and distance to cities are major explanatory factors of population decline.

	MODEL 1	
	B	*BETA*
Locational characteristics (ref = rural areas)		
3 largest cities	13.540	0.227***
Areas within 15 km from 3 largest cities	31.404	0.685***
Other cities	5.999	0.123***
Areas within 15 km from medium cities	9.479	0.190***
Areas within 15 km from smaller cities	3.885	0.129***
Sociodemographic characteristics		
Percentage of working-age population, 2001		
Percentage of households with children, 2001		
Socioeconomic characteristics		
Percentage of university education, 2001		
Change in the percentage of university education, 2001-2011		
Percentage of employed, 2001		
Percentage of employment in business services, 2001		
Change in the percentage of employment in business services, 2001-2011		
Percentage of high-ranking occupation, 2001		
Constant	-20.715	
R^2	0.432	
F(df), significance	540(5), 0.000	
Residual sum of squares (total 107 440)	61 004	
* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.		

TABLE 2.2 Linear regression model of percentage population change at the *seniūnija* level (*N* = 546)

	MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	B	*BETA*	*B*	*BETA*	*B*	*BETA*	*B*	*BETA*
	5.739	0.096**	10.440	0.175***	-1.297	-0.022	-10.784	-0.181***
	26.807	0.584***	26.632	0.581***	17.243	0.376***	13.675	0.298***
	0.301	0.006	1.186	0.024	-4.416	-0.091	-2.133	-0.044
	7.394	0.148***	7.365	0.147***	4.588	0.092***	3.27	0.065**
	2.865	0.095**	2.419	0.080	1.639	0.054	1.342	0.044
	0.631	0.222***	0.129	0.045	-0.354	-0.125	-0.216	-0.076
			0.431	0.210***	0.709	0.346***	0.726	0.354***
					0.517	0.247***	0.436	0.209***
					1.791	0.351***	1.322	0.259***
							0.207	0.125***
							1.596	0.491***
							5.773	0.491***
							-0.269	-0.133**
	-57.705		-42.546		-40.451		-56.005	
	0.453		0.475		0.576		0.633	
	539(6), 0.000		538(7), 0.000		536(9), 0.000		532(13), 0.000	
	58 747		56 390		45 508		39 389	

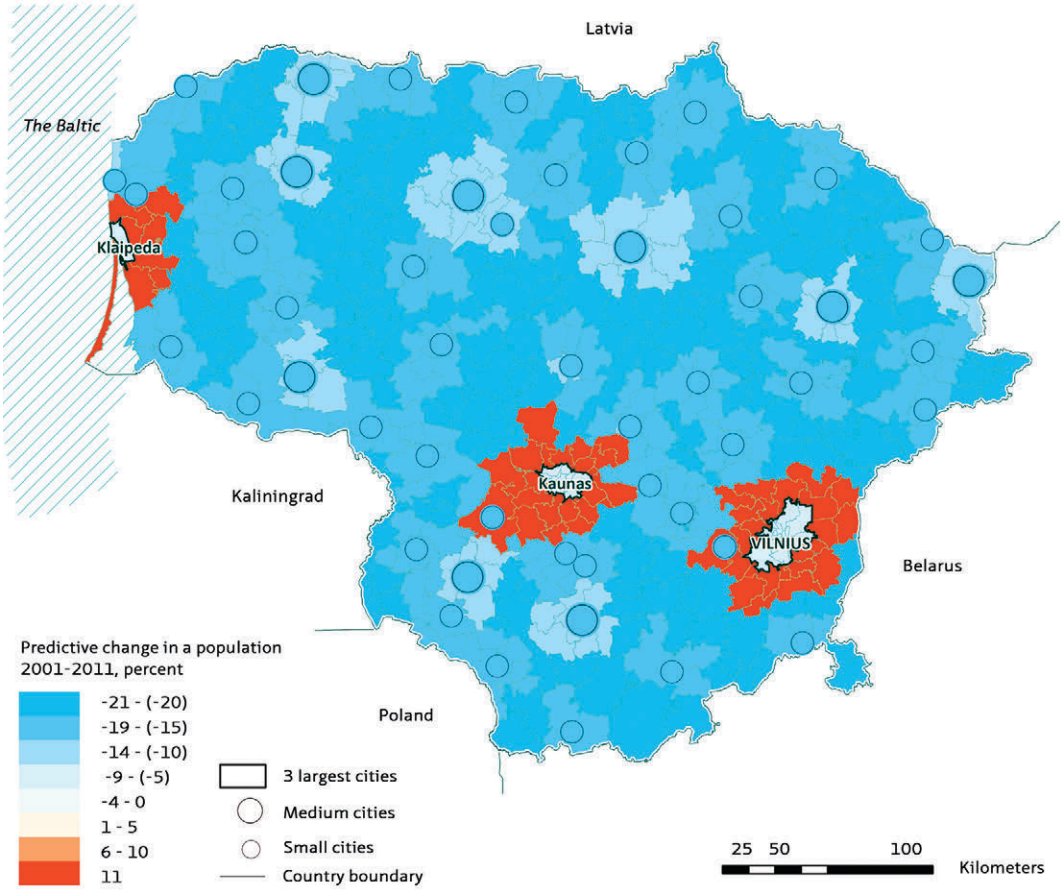

FIGURE 2.2 Predictive population change according to geographical location factor in *seniūnija* in 2001-2011 (based on the outcome of model 1)
Source: own calculations based on the 2001 and 2011 Lithuanian census

In the subsequent models, we sought to examine whether the geography of population decline can be explained by other factors: what are the underlying explanations of the geographical pattern? In model 2, a sociodemographic variable measuring the percentage of working-age population (people aged between 15 and 65) is included. This age group has the highest impact on the population change compared to the other groups (the under-15- and over-65-year-old, results not shown). The higher the percentage of working-age population, the higher the increase in population. Part of this effect is caused by the fact that a large proportion of the working-age population is also in the family formation stage. After controlling for the working-age population, the effect of the three largest cities decreases significantly. This means that the relatively favourable population trajectory of these cities is caused by their favourable age

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composition. According to census data from 2001, in the three largest cities, 64% of the population was of working-age, compared with 59.5% in Lithuania as a whole and 52.7% in rural areas (Statistics Lithuania, 2002). Because of the inclusion of the age composition variable, the effect of the other cities, compared to the reference category of rural areas, diminishes and becomes insignificant in model 2. Thus, when controlling for the age composition, other cities are not statistically different in population change from the rural areas. The effect of suburban areas reduced only slightly after the age composition was included, which suggests that the geographical location of suburban areas is more important than their demographic composition.

Model 3 also includes the percentage of households with children. The higher the percentage of the households with children, the higher the increase in population (or the lower the decrease). This variable partly overlaps with the working-age population (the correlation is 0.625, so multicollinearity is no big issue); therefore the effect of the working-age population decreases when the percentage of households with children is included.

In model 4, we added a variable indicating the percentage of people with university education and a variable measuring the change in the percentage of university educated people between 2001 and 2011. The results show that the higher the share of university educated residents, the higher the population increase in an area. The results also show that an increase in the percentage of university educated residents is associated with an increase in population. This model explains 57.6% of all variation in population change between the areas. After controlling for education, the effect of the largest three cities lost its significance. Therefore, the initial positive effect of the largest cities, in addition to their favourable age structure, can be explained by the higher average levels of education of their population.

An interesting and unexpected finding is that the level of unemployment has no significant effect on the population change in an area (results not shown in Table 2.2, but can be found in the Appendix, Table 2.4). The correlation between population change and unemployment rate was also insignificant in our dataset. An underlying cause might be that unemployment is poorly registered. Many people in Lithuania register themselves as unemployed in order to receive social benefits, while at the same time they might be working informally or have temporarily emigrated abroad. According to many studies, unemployment is a relevant factor determining out-migration and population decline (Ní Laoire, 2000; Panagopoulos & Barreira, 2012; Stockdale, 2004). However, other research has shown that unemployment does not necessarily associate with population decrease (Elshof, van Wissen, & Mulder, 2014; Etzo, 2008; Tervo, 2000).

Finally, model 5 includes some variables measuring labour market characteristics. The results show that the higher the share of employed persons (as a percentage of the working-age population), the lower the population decline. When including employment by economic sector (controlling for all other characteristics), we only found employment in the business service sector to have a significant impact on population change. The higher the percentage of employment in this sector, the higher the population increase in an area. The results also show that an increase in the percentage of employment in business services is associated with an increase in population. In addition, the higher the share of population having a high-ranking occupation (managers and professionals), the higher the increase in population. After controlling for the last set of (labour market) characteristics, the effect of the largest cities and the effect of their suburban areas decreased. It means that those areas have more capacity to hold on and attract population due to a better structure of the labour market. Meantime, the effect of the other cities and the suburban areas (no matter what is the size of the city they surround) did not change much. This result implies that the labour market had little impact on the population change in these areas or that the structure of the labour market is already unfavourable here.

It has to be mentioned that we did not include the ethnic composition of the population in the main models because of the specific geographical composition of ethnic minorities in Lithuania. Due to historical reasons, most of them are concentrated in the Vilnius region (Ubarevičienė, Burneika, & van Ham, 2015), where population is increasing because of the suburbanization process.

Model 5 explains 63.3% of all variation in the data, with a limited set of regional characteristics. This is a good result, especially since the size of the spatial units is relatively large and there is little homogeneity within them. Other studies, which used linear regression to model similar social processes, found similar levels of prediction (van Ham & Clark, 2009). When we map the predicted values of model 5 (see Figure 2.3), we see that the model performs really well and replicates the pattern of real population change as observed in Figure 2.1. The model which only included locational factors already explained 43% of all variation between the areas, while a model which only included a set of sociodemographic and economic characteristics explains 53.3% of all variation (see Table 2.3 in the Appendix). When we map the predicted values without locational characteristics (Figure 2.4 in the Appendix), we do see the effects of cities and the surrounding areas, but such model fails to identify smaller population decline in the more distant suburban areas of the larger cities. This indicates that these suburban areas have a certain 'locational advantage' over other places with regard to how attractive they are to live in. So, geography, and mainly distance to the three main cities, plays a role on top of sociodemographic and economic area characteristics. This relates back to the ongoing transformations of the urban network (mainly metropolitan growth) as discussed in the theoretical part of this paper.

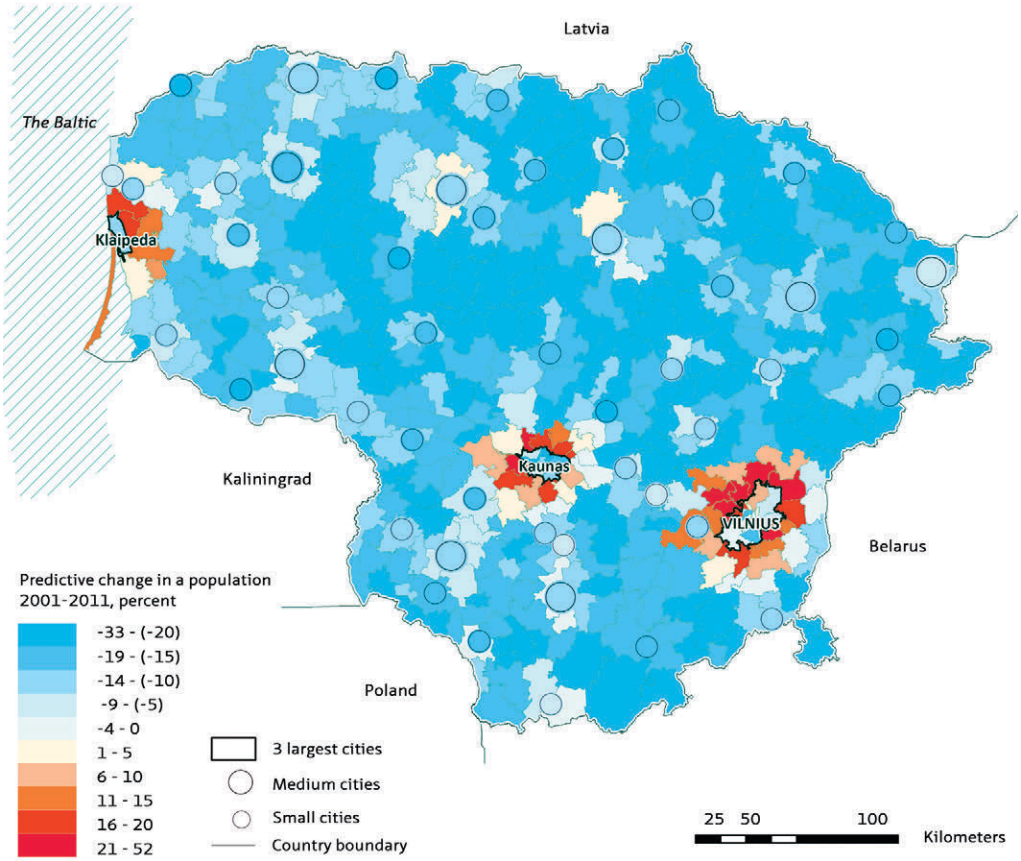

FIGURE 2.3 Predictive population change according to geographical location and socioeconomic factors in *seniūnija* in 2001-2011 (based on the outcome of model 5)
Source: own calculations based on the 2001 and 2011 Lithuanian census

The results of the cartographical analysis showed that all predictive models are less accurate in the areas, where the actual population change was the most extreme. How well the models performed can be illustrated by mapping the residual values of each model (see Figure 2.5 in the Appendix). The mapped residuals show that the models performed less well in the suburban areas around the largest cities (and even the smaller cities), which experienced population increase. The model with only locational characteristics mostly overestimates population change in the suburban areas, while the model which includes only social and economic factors mostly underestimates them. Although the final model (Model 5) performs the best, the highest residual values remain to be found in the suburban areas. This finding suggests that there might be more factors influencing population change in the suburbs, which we could not include in our models, or that these areas are less homogenous than others, and therefore less predictable.

Many other variables were included in the preliminary analysis, but they were excluded from the final models as presented, since they did not improve the predictive power of the models. We have tested models with more detailed information on unemployment levels, the use of social benefits, average wages, foreign investments, the number of economic entities, and social housing (the last four variables were only available at the municipal level due to limited access to the lower level data). However, none of these variables were significant in the models. The extended model, including all characteristics, can be found in Table 2.4 in the Appendix.

§ 2.5 Conclusions and discussion

Lithuania is losing population at increasing rates since the political reforms of the early Nineteen Nineties, and it is now among the fastest shrinking countries in the world. Our analyses showed that the population decline is unevenly distributed throughout the country. The highest rates of depopulation were recorded for the rural and peripheral areas of Lithuania; meanwhile, population increases could be observed in the regions directly surrounding the major cities. Although all CEE countries experienced similar trends of spatial development, the urban structure developed during the Soviet times makes the spatial variations in population change more profound in Lithuania compared to the other countries. The main reason was that the largest cities in Lithuania were relatively underdeveloped as they lagged behind in their 'natural' growth.

The main aim of this paper was to get more insight into the geography of population change in Lithuania and to increase our understanding of the factors which contribute to population change. A novelty of the study was that we investigated shrinkage for a whole country, using data at a very low spatial level (*seniūnija*), where most other studies use much larger municipalities. Moreover, this is one of the first studies to use the 2011 Lithuanian census. In our linear regression models, we included two types of area characteristics: a detailed urban-rural classification and a range of sociodemographic and economic characteristics. Our main hypothesis was that the urban-rural distinction would be the most important predictor of variation in population change between regions.

Our results show that the geographical pattern of population decline is highly structured and that city size and distance to cities are important factors in explaining this pattern. The model with only the locational factors included already explained

43% of all variation in population change between regions. Thus, the hypothesis that the geographical location is an important predictor of the population change can be supported. In line with the literature, we found that the age structure and the household structure (percentage of households with children) of the population are important sociodemographic characteristics playing a role in the process of decline. The higher the percentage of working-age population and households with children, the lower the population decline. Moreover, the higher the share of university educated residents, the higher the population increase in an area. An interesting and unexpected finding is that the percentage of joblessness has no significant impact on population change; however, an underlying cause might be poorly registered unemployment. Our results also showed that the higher the percentage of employment in the business service sector and the higher the share of the residents with high-ranking occupations, the higher the population increase. We did not find a significant relationship between jobs in other sectors of the economy (agriculture, industry, traditional services, and public administration) and population change, when controlling for other characteristics. Moreover, the analysis showed that the level of foreign investments is not an important factor predicting population change. Our final regression model explained 63.3% of all variation in the data. Our analysis of predicted values and associated residuals showed that our models performed less well in the suburban areas directly surrounding the largest cities. This suggests that there are processes at play that could not be captured using the variables we included.

To conclude, the geographical pattern of population change clearly shows that the areas directly surrounding larger cities are increasing in population, while rural and peripheral areas are experiencing extreme population decline. Our results give little hope to those who would like to develop policies to stop this decline outside metropolitan regions. Geography seems to be very important factor explaining population change. Lithuania can be seen as a large experiment of urban development and population redistribution. Under Soviet rule and a centrally planned economy, policies were aimed at actively redistributing population away from the largest cities and towards regional cities and rural areas. This policy was more explicit in Lithuania than in other CEE countries and was aimed at reducing the dominance of the capital city of Vilnius. However, after the early 1990s and the fall of the Soviet regime, market economic forces took over and despite large scale emigration from Lithuania, the three largest urban regions started to grow. Most population growth was experienced in the suburban rings of these cities. This indicates that the preferences of households developed in the direction of the suburbs, a process which could be observed decades before in Western European cities. Based on our results, we believe that the process of decline will not stop soon in Lithuania. We now observe that the population is concentrating in the metropolitan regions; this process is fuelled at the expense of the rest of the country. However, the capacity of the regions, in terms of human recourses,

is decreasing; thus the migration towards the metropolitan areas will drop, and the population in these regions will stop growing or even may start to decline as well (if no major changes in international migration occur).

Although the attention to population decline is increasing in Lithuania, most of the regional planning is still growth oriented. Local politicians and planners do not seem to accept that population decline might be an unavoidable process, common to many European regions, but manifesting strongly in Lithuania. There are no well-developed plans or strategies to adapt to the shrinkage. As the population of the whole country is declining, attracting new residents to one declining area would mean more decline in other areas. As in other (Western) European countries, the current investments into declining regions (e.g., in transport infrastructure and school renovation) are costly and ineffective. It is interesting that although the population decline in Lithuania is quite extreme, the economy of the country is still growing. This can be explained by the increasing productivity of the labour force and the positive role of internal migration with young people moving to cities. On the other hand, the growing economy is one of the excuses for the government not to take any steps in managing the structural process of population. Depopulation will inevitably lead to negative consequences, especially in peripheral regions, which are rapidly losing their human capital. Without any strategy to cope with shrinkage, population decline might even pose a threat to the stability of the economy and the society of Lithuania, especially when regional levels of inequality are rising and people in declining areas feel left behind by the national government.

We believe that spatial planning policies – which are currently lacking – could play a major role in dealing with decline, but the challenge is how to keep a good balance between the needs of the residents and financial capacities of the state. One of the areas that need urgent attention is the network of public amenities. This network was designed for a population of 4 million people and was fairly evenly distributed across the country, while the current population is 3 million and more and more concentrated in cities. Although the reorganization of infrastructure and services has already started, it lacks consistency, rationality, and efficiency. To cope with the population decline, regional centres must be formed with concentrations of a variety of high quality services, accessible by (public) transport for all residents. This is a strategy used by many Western countries. At the same time, it is important to develop financial instruments to improve employment and housing opportunities for young people and families to encourage them to stay in the provinces or at least in the country.

The development of alternative economic activities, especially those requiring a lotof space or a natural environment (e.g., alternative energy and tourism) or activities focussed on the 'silver economy'[18] of population aging, could create new jobs. Economically, it might make most sense to plan for further population concentration in Lithuanian cities, as this is the most cost-efficient in terms of services and infrastructure. In declining areas, the most efficient strategy would be to accept decline and concentrate services in accessible regional centres.

Acknowledgments

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18 The silver economy is a concept that has emerged in response to ageing demographics (European Commission, 2015).

Appendix

	MODEL 1	
	B	*BETA*
Sociodemographic characteristics		
Percentage of working-age population, 2001	1.192	0.420***
Percentage of households with children, 2001		
Socioeconomic characteristics		
Percentage of university education, 2001		
Change in the percentage of university education, 2001-2011		
Percentage of employed, 2001		
Percentage of employment in business services, 2001		
Change in the percentage of employment in business services, 2001-2011		
Percentage high-ranking occupation, 2001		
Constant	-87.676	
R^2	0.177	
F(df), significance	544(1), 0.000	
Residual sum of squares (total 107 440)	88 449	
* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.		

TABLE 2.3 Linear regression model of percentage population change at the *seniūnija* level (*N* = 546)

	MODEL 2		MODEL 3		MODEL 4	
	B	*BETA*	*B*	*BETA*	*B*	*BETA*
	0.748	0.264***	-0.224	-0.079	-0.314	-0.111*
	0.513	0.250***	0.879	0.429***	0.979	0.478***
			0.246	0.118*	0.291	0.139*
			2.661	0.521***	2.031	0.398***
					0.116	0.07*
					1.475	0.454***
					5.448	0.464***
					-0.346	-0.17***
	-78.899		-51.620		-52.557	
	0.215		0.461		0.533	
	543(2),0.000		541(4), 0.000		537(8), 0.000	
	84 339		57 961		50 125	

	MODEL 1	
	B	*BETA*
Geographical characteristics (ref = rural areas)		
3 largest cities	13.540	0.227***
Areas within 15 km from 3 largest cities	31.404	0.685***
Other cities	5.999	0.123***
Areas within 15 km from medium cities	9.479	0.190***
Areas within 15 km from smaller cities	3.885	0.129***
Sociodemographic characteristics		
Percentage of working-age population, 2001		
Percentage of households with children, 2001		
Socioeconomic characteristics		
Percentage of university education, 2001		
Change in the percentage of university education, 2001-2011		
Percentage of employed, 2001		
Percentage of employment in business services, 2001		
Change in the percentage of employment in business services, 2001-2011		
Percentage of high-ranking occupation, 2001		
Percentage of joblessness, 2001		
Percentage of employment in industry and construction sector, 2001		
Percentage of employment in traditional service sector, 2001		
Percentage of employment in public administration, 2001		
Percentage of receiving social benefits, 2001		
Municipal-level variables		
Average wage, 2001		
Foreign investments per capita 2001-2011		
Number of economic entities per 1000 person, 2001		
Number of social dwellings per person, 2003		
Constant	-20.715	
R^2	0.432	
F(df), significance	540(5), 0.000	
Residual sum of squares (total 107 440)	61 004	
* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.		

TABLE 2.4 Linear regression model of percentage population change at the *seniūnija* level (*N* = 546)

	MODEL 2		MODEL 3		MODEL 4	
	B	*BETA*	*B*	*BETA*	*B*	*BETA*
	-10.784	-0.181***	-12.568	-0.21***	-12.429	-0.208***
	13.675	0.298***	12.011	0.262***	12.084	0.263***
	-2.133	-0.044	-3.938	-0.081*	-3.917	-0.081*
	3.27	0.065**	2.681	0.054*	2.497	0.05*
	1.342	0.044	1.054	0.035	1.129	0.037
	-0.216	-0.076	-0.313	-0.11*	-0.32	-0.113*
	0.726	0.354***	0.727	0.355***	0.706	0.345***
	0.436	0.209***	0.353	0.169**	0.39	0.186**
	1.322	0.259***	1.21	0.237***	1.225	0.24***
	0.207	0.125***	0.225	0.135***	0.218	0.131***
	1.596	0.491***	1.551	0.478***	1.536	0.473***
	5.773	0.491***	5.664	0.482***	5.592	0.476***
	-0.269	-0.133**	-0.218	-0.107	-0.24	-0.118*
			0.041	0.017	0.04	0.016
			0.027	0.019	0.025	0.017
			0.178	0.082*	0.173	0.079*
			-0.034	-0.016	-0.03	-0.015
			-0.259	-0.046	-0.286	-0.051
					-0.01	-0.035
					0.033	0.055
					-0.105	-0.035
					0.163	0.022
	-56.005		-49.523		-44.980	
	0.633		0.638		0.640	
	532(13), 0.000		527(18), 0.000		523(22), 0.000	
	39 389		38 855		38 673	

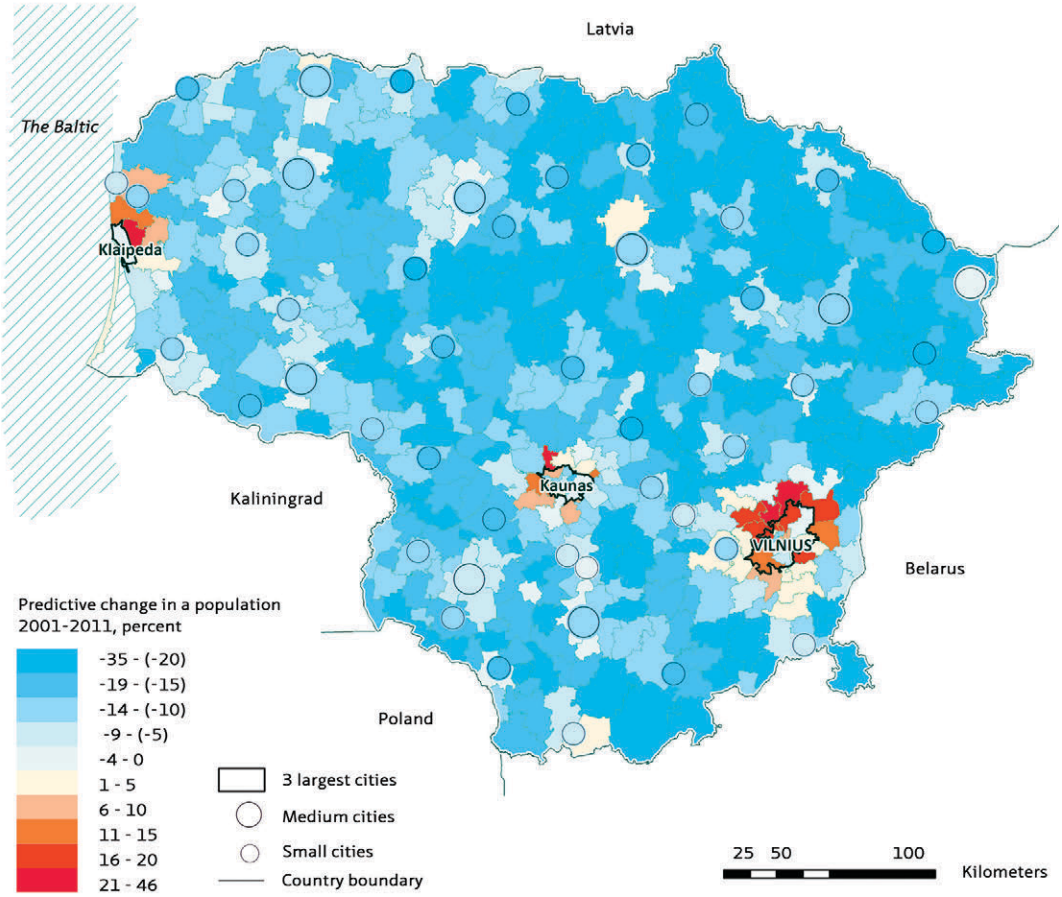

FIGURE 2.4 Predictive population change in *seniūnija* in 2001-2011 (based on model 4 in Table 2.3)
Source: own calculations based on the 2001 and 2011 Lithuanian census.

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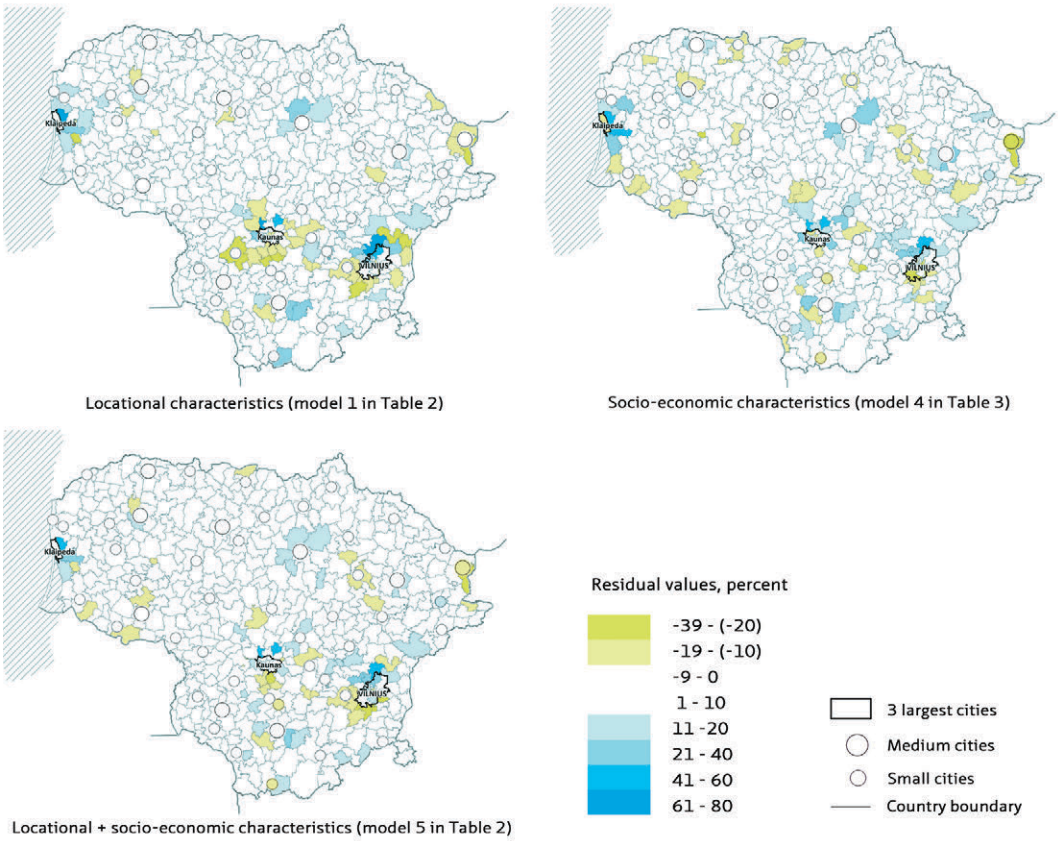

FIGURE 2.5 Residuals of various models
Source: own calculations based on the 2001 and 2011 Lithuanian census

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3 Population decline in Lithuania. Who lives in declining regions and who leaves?

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Abstract

Since the 1990s, Lithuania lost almost one-quarter of its population, and some regions within the country lost more than 50% of their residents. Such a sharp population decline poses major challenges to politicians, policy-makers and planners. The aim of this study is to obtain more insight into the recent processes of socio-spatial change and the role of selective migration in Lithuania. The main focus is on understanding who lives in those regions which are rapidly losing population, and who is most likely to leave these regions. This is one of the first studies to use individual-level Lithuanian census data from 2001 and 2011. We found that low socio-economic status residents and older residents dominate the population of shrinking regions, and unsurprisingly that the most 'successful' people are the most likely to leave such regions. This process of selective migration reinforces the negative downward spiral of declining regions. As a result, socio-spatial polarization is growing within the country, where people with higher socio-economic status are increasingly overrepresented in the largest city-regions, while the elderly and residents with a lower socio-economic status are overrepresented in declining rural regions. This paper provides empirical evidence of selective migration and increasing regional disparities in Lithuania. While the socio-spatial changes are obvious in Lithuania, there is no clear strategy on how to cope with extreme population decline and increasing regional inequalities within the country.

Keywords

Population decline; shrinking regions; internal migration; socio-spatial polarization; Lithuania

§ 3.1 Introduction

In the last decades, many developed countries have been confronted with regional population decline (Haartsen & Venhorst, 2010; Haase, Athanasopoulou, & Rink, 2016; Hospers, 2012; Reher, 2004). There is increasing attention for the causes and consequences of these so-called 'shrinking regions', which is reflected in media attention and in academic and political debates (Sousa & Pinho, 2015). These debates largely portray declining regions as deteriorating and problematic and emphasize the need to counter the population decline.

Central and Eastern European (CEE) countries are losing their populations at the national level, and at some of the highest rates in the world. Between 2000 and 2010 they lost on average -3.7% of their population. In Lithuania, the population decline was -10.4% (United Nations, 2015). In a quarter of a century, since the early 1990s, Lithuania lost more than one-fifth of its residents (a rapid decrease from 3.7 million in 1989 to 2.9 million in 2015), which makes it one of the countries with the greatest population decline in the world (The Economist, 2017; United Nations, 2015). Some regions lost more than 50% of their residents. Such a strong decrease in population, not seen in any Western European country, was the result of the combined effects of major political, economic and social transitions. Large-scale emigration, natural population decline and changing residential mobility patterns caused the socio-spatial landscape of Lithuania to change in a fast and dramatic way.

The pattern of population change in Lithuania shows a concentration of population in the metropolitan areas (MAs) and a sharp decline in peripheral rural regions (Ubarevičienė, van Ham, & Burneika, 2016). It has been shown that internal migration plays a major role in the processes of population redistribution and growing spatial imbalances (Ambinakudige & Parisi, 2015; Ubarevičienė, 2016). However, little is known about the directions of migration flows within Lithuania as well as the demographic and socio-economic composition of such flows. By knowing that migration tends to be selective by nature (Fratesi & Percoco, 2014; Tervo, 2000), it can be expected that the population leaving declining regions in Lithuania is very selective as well. The extreme population decline in some regions of Lithuania and the growth of population in others can be expected to result in increasing regional differences. These differences might endanger the stability of society and the economy.

This paper seeks to obtain more insight into the recent processes of socio-spatial change in Lithuania, with specific attention for the role of selective migration. While the focus is on Lithuania, the results of this study will also be of value for other CEE countries, many of which experienced similar trajectories during recent decades

(Gentile, Tammaru, & van Kempen, 2012; Smith & Timar, 2010). This paper will investigate the characteristics of those (1) who live in the rapidly declining regions and (2) those who are most likely to leave such regions. We will also investigate the effects of regional characteristics on population mobility. In this study, we are focusing on those regions that experienced the sharpest population decline (-20% and more) during 2001-11. This study is one of the first to use individual-level Lithuanian census data from 2001 and 2011, and is also the first to explore internal migration and population change at the individual-level in Lithuania. Logistic regression models were used to investigate the differences between the residents of the rapidly declining regions[19] and the rest of the country as well as to gain an understanding of the individual differences in migration behaviour among the residents of the rapidly declining regions.

§ 3.2 Literature review on population decline, migration and regional differences

Population decline is dependent on political, economic and social conditions, and therefore it is a multifaceted and complex phenomenon (Haase, Bernt, Großmann, Mykhnenko, & Rink, 2016). Although it is not a fundamental rule, once population decline in an area has started, it is difficult to reverse it (Hudson, 2015; see also Myrdal, 1957). Population decline often starts with economic decline, but then becomes part of a vicious circle, causing a downward spiral of the local economy, declining tax revenues, a decline in service provision and social infrastructure, and more and more abandoned homes and factories (Elshof, van Wissen, & Mulder, 2014). Such developments make a region even less attractive to the people who are left behind and increase their probability to leave as well. At least in (neo-classical) theory, labour migration should eventually lead to a new (spatial) economic equilibrium as the cost of labour drops in shrinking areas, making these areas more attractive for employers (Sjaastad, 1962). However, according to Fratesi and Percoco (2014, p. 1651), 'a number of theoretical approaches … have pointed out that migration may even give rise to larger regional disparities, especially in those cases in which it is not skill-neutral but skill-selective'. The latter authors argue that skilled people benefit most from migration and they are most likely to relocate, while the sending regions lose their human capital

19 In this paper, sometimes when using terms 'declining' or 'shrinking' we refer to 'rapidly declining regions' (population decline -20% and more).

and eventually also their economic potential. Therefore, the process of migration is typically accompanied by increasing regional disparities, characterized by an increasing gap between 'winning' and 'losing' regions.

Most internal migration is a response to labour market conditions, educational opportunities, family factors or a desire to improve quality of life (Biagi, Faggian, & McCann, 2011; Niedomysl, 2011; Nivalainen, 2004). For example, many studies show that the propensity to migrate drops as age increases. Young adults are more likely to move out from rural regions for education and employment reasons, while with age people accumulate 'commitments' making migration more complex and costly. The elderly are the least inclined to move and tend to age in place (Coulter & Scott, 2015; Elshof et al., 2014; Tervo, 2000). The probability to move over longer distances also highly depends on socio-economic status; it is much lower for individuals with a weaker labour market position (Fratesi & Percoco, 2014). Therefore, it can be expected that the effect of 'brain drain' eventually leads to an overrepresentation of low-educated, low-skilled and unemployed people in shrinking regions. Some studies show that ethnic minorities are less likely to move than those belonging to majority populations (Sjöberg & Tammaru, 1999; Tammaru, van Ham, Leetmaa, Kährik, & Kamenik, 2013), but some studies also find the opposite (Bonvalet, Carpenter, & White, 1995; Finney & Simpson, 2008). Moreover, housing characteristics also play a role in migration behaviour. For example, the probability to move is lower for owner-occupiers than for renters due to higher transaction costs for owners (Coulter & Scott, 2015; Tervo, 2000).

A number of studies show that contextual factors such as regional unemployment rate and wage differences are key elements in understanding migration (Etzo, 2008). Many studies find that a high unemployment rate is associated with high out-migration (Ní Laoire, 2000; Nivalainen, 2004; Panagopoulos & Barreira, 2012; Stockdale, 2004). However, Tervo (2000, p. 343) showed 'that higher origin unemployment rates increase out-migration, but not particularly for unemployed workers'. Other studies showed that there is no effect or even the reverse effect between these two variables (Elshof et al., 2014; Etzo, 2008). Labour market structure, degree of urbanization, population density and distance to major MAs are also among commonly reported contextual variables influencing migration (Nivalainen, 2004). The general trend is that people move from less to more urbanized areas, and from agricultural to industrial and service-leaded regions. However, the urban life-cycle theory says that urbanization is often accompanied by suburbanization and counterurbanization (van den Berg, Drewett, Klaassen, Rossi, & Vijverberg, 1982), because different locations are attractive to people with different individual characteristics, needs, opportunities and motives (Ambinakudige & Parisi, 2015). Meanwhile, immobility can be an outcome of constrains or a product of someone's choice (Coulter & Scott, 2015).

According to Fratesi and Percoco (2014), persistent population decline, especially when it accompanies an ageing population and brain drain, is the most harmful and difficult to reverse, and leads to imbalances between regions, and may hinder economic growth. On the other hand, although Stockdale (2004) identifies rural out-migration as a 'loss of human and social capital', she emphasizes the positive side of migration as mobile individuals can enjoy opportunities that would otherwise not be available to them. Moreover, rural shrinkage is a natural response to structural changes in the economy, including increasing efficiency of the agricultural sector. Sousa and Pinho (2015) argue that shrinkage could be perceived as an opportunity for planners and decision-makers, but new and innovative solutions must be designed to manage structural shrinkage processes.

§ 3.3 Population distribution in Lithuania: shift from socialist to post-socialist period

For five decades[20] Lithuania and other CEE countries were under the communist regime and subject to a command economy model, which was based on the principles of central planning (Borén & Gentile, 2007; Sjöberg, 1999). During this period, population movement was regulated between the communist states and even within national borders. An even spread of population was the aim of the communist planning doctrine, and it was intended to achieve that through the spatial distribution of human and economic resources (Bertaud & Renaud, 1997). In many CEE countries there was an intention to develop a uniform network of regional centres, while suppressing the growth of a few major cities. In the Baltic States, which had a major role as suppliers of agricultural production to the Soviet Union, residents were encouraged to live and work in rural settlements where they were provided with housing facilities and income, often at a higher standard than in the cities (Tammaru, 2001). By the end of the Soviet period, one-third of the population of the Baltic States resided in rural settlements and had jobs in the primary sector. In Lithuania, there was a strategy to decentralize population and industry into medium and small-size cities (Vanagas, Krišjane, Noorkoiv, & Staniūnas, 2002). Such territorial organization was only possible in a society without market competition and private property (all property was nationalized in the Soviet Union).

20 The decades 1945/50 to 1989/91 (the period of socialism lasted differently in different CEE countries).

It is not surprising that the sudden change in the political and economic situation in the 1990s resulted in a new stage of regional development as well as socio-spatial change in Lithuania. The inherited Soviet urban system did not meet the needs of the post-socialist society. The extreme population decline, and the growing regional disparities in Lithuania of the last decades, can be largely considered as the outcome of Soviet planning principles. For decades regional disparities were prevented by strict planning policies. Many regions, whose growth had been stimulated during the Soviet period by providing jobs in low-tech industry, suddenly became unable to provide a sufficient level of employment and standard of living under a market led neo-liberal economic system. Previously controlled flows of internal migration changed direction, and many people moved towards the larger cities. Moreover, economic downturn and a sharp rise in unemployment, combined with accession to the European Union, stimulated emigration (Anniste, Tammaru, Pungas, & Paas, 2012; Black, Engbersen, Okólski, & Pantîru, 2010; Thaut, 2009).

Emigration accounts for around 80% of the population decline in Lithuania over the past decade, and Lithuania now has one of the highest emigration rates in the European Union (EUROSTAT, 2016; Statistics Lithuania, 2012). At the same time, birth rates dropped sharply, which happened so suddenly that some demographers have called it the 'demographic shock' (Eberstadt, 1994; Rychtaříková, 1999; Sobotka, Zeman, & Kantorová, 2003; Steinführer & Haase, 2007). In Lithuania, since 1994 the crude rate of natural population change has been negative and decreasing; between 2001 and 2016 the average annual rate was -3.6 per 1000 people. It means that due to the natural change, population dropped by 185,000 over this period, which accounts for 6% of the total country's population (Statistics Lithuania, 2017). The total population decline unevenly affected regions within Lithuania and as a result regional differences increased. At the same time income inequality also increased as not all groups benefitted equally from the new market economic system (Kährik & Tammaru, 2008; Valatka, Burneika, & Ubarevičienė, 2016).

Despite the general population decline in Lithuania, an increasing concentration of population is observed in the major city-regions, albeit the population is dropping in the inner cities themselves (Ubarevičienė et al., 2016). This is a spatial pattern common for all CEE countries, where urban expansion of the major cities is taking place due to the intense suburban development since the early 1990s (Kok & Kovács, 1999; Leetmaa & Tammaru, 2007; Nuissl & Rink, 2005; Ouředníček, 2007). According to Ehrlich, Kriszan, & Lang (2012), the city-regions can be called the 'winners' of the socio-spatial changes, while other areas of CEE countries experience adverse developments. The most radical demographic changes take place in the peripheral countryside regions, which are losing population at the highest rates and experience profound changes in the demographic and socio-economic composition (Pociūtė-

Sereikienė, Kriaučiūnas, and Ubarevičienė, 2014). These regions are characterized by low population density, dominance of employment in agriculture and relatively large distances from bigger cities (outer and inner peripheries of the countries). A significant drop in the importance of agriculture, which was prioritized under the communist regime (Enyedi, 1998; Leetmaa & Tammaru, 2007; Tammaru, 2001), reduced the number of jobs in rural regions several times and raised the level of unemployment. Since the collapse of the Soviet Union most of the peripheral regions of Lithuania did not receive any major investments, and public as well as private service provision was constantly declining in these regions. It is evident that such a situation had to lead to out-migration, further deteriorating the living conditions for the majority of remaining population, because of the reduced likelihood of further investments in service provision or employment. Although all the factors (natural population change, internal and outward migration) contribute to the population drop and changing population composition, it has been shown that internal migration is the most effective in redistributing population from rural to urban areas (Ambinakudige & Parisi, 2015; Ubarevičienė, 2016).

The aim of this paper is to obtain more insight into the composition of the population in the rapidly declining regions in Lithuania and the composition of the flows out of these regions, as well as to understand to what extent the Soviet-made settlement system contributed to extreme population decline and population redistribution in Lithuania.

§ 3.4 Data and methods

This is one of the first studies in Lithuania to use individual-level geocoded data from the 2001 and 2011 Lithuanian censuses. It is also the first study to explore internal migration and population change using individual data from Lithuania, so there is little prior knowledge of the underlying processes in Lithuania. Previous studies have used aggregated-level data on municipality (LAU 1) or ward (LAU 2) level, and these studies could only investigate net migration. Using individual-level data we are now able to investigate the directions and population structure of migration flows as well as the relationships between the individual characteristics which are affecting migration.

Census data, despite the advantage that they include the whole population, typically have some shortcomings when investigating migration. First, Lithuanian census data only capture a change of residence in the one-year period before the census date.

It records the current place of residence and the previous place of residence if the person has moved inside Lithuania, but the exact timing of migration cannot be observed. Second, information on individual characteristics is only available on the census date. This implies that for movers we only know their characteristics after the move, but not before. So the effects of time-varying variables such as education, occupation and household status should be interpreted with caution. Third, census data in Lithuania do not provide information on intra-urban or intra-rural migration; only those moves when the boundary of the city municipality or ward (LAU 2 region) was crossed have been recorded. Fourth, census data do not contain any information on the reasons or motives of internal migration. In addition, both the Lithuanian censuses (2001 and 2011) were conducted in post-crisis periods, which could temporarily affect the directions of internal migrations. Generally, all migration studies using census data suffer from similar problems, also in other countries (Leetmaa & Tammaru, 2007; Nivalainen, 2004; Sjöberg & Tammaru, 1999; Tervo, 2000), but it is important to be aware of them when discussing study results. Despite these shortcomings in the data, this study is an important step forward in better understanding internal migration and depopulation processes in the post-socialist countries.

The focus of this research is on the most declining regions in Lithuania, where the population dropped by more than 20% between 2001 and 2011. Some urban areas of the major cities also lost a significant share of their population (partly due to suburbanization), but these were not included in this study due to the different processes underlying rural and urban decline. This study focuses on the effects of internal migration on declining regions, although also natural change and international migration are affecting population change. But these latter processes are beyond the scope of this research.

The empirical analysis is organized into three stages. First, using the aggregated-level data we investigate the compositional differences of Lithuanian population, focusing on the residents of the declining regions and those who have moved out from them. Second, we use individual-level data and run a set of binary logistic regression models to explore further the differences between the residents of the rapidly declining regions and the rest of the country. And third, we analyse the migration behaviour of individuals. Typically, a moving decision is made by households and not by individuals. Therefore, only household reference persons older than 18 years are included in the analyses.[21] Although the reference person is not necessarily the one who determines

21 There were 3342 reference persons younger than 18 years in Lithuania; they were excluded from the analysis.

the decision of the whole household to move, data limitations do not allow us to include other household members into the analysis. There were 1,263,937 (or 42% of the total population) reference persons in all the households in Lithuania in 2011. Our analysis is focused into 139,578 individuals of the rapidly declining regions, of whom 1605 have moved out of these regions between 2010 and 2011. We used multinomial logistic regression to predict probabilities of the different possible outcomes of migration behaviour and migration directions; we compared persons who did not move from the rapidly declining regions with those who moved into 'losing' and 'winning' regions. Summary statistics of the main variables included in the models can be found in Table 3.1. When reporting the results, we do not provide significance levels because we have full population data.

In addition to the census data, we also report some results from a survey among residents (N = 602) of the sparsely populated regions in Lithuania. The survey was completed in 2012 and was part of the project 'Lithuanian Sparsely Populated Areas and their Inhabitants' (SIN-02/2012). Sparsely populated areas almost fully coincide with rapidly declining regions, which are the focus of this paper.

§ 3.5 Results

The declining regions of Lithuania

Figure 3.1 shows the spatial pattern of population change in Lithuania. Population decline can be seen almost everywhere in the country, except in the suburban areas around the major cities. The regions with the sharpest decline in population (-20% and more) covered 44% of the countries' territory and inhabited around 330,000 or 11% of the total population in 2011 (urban areas of the major cities excluded). These regions with the largest population decline are mostly rural regions, but also include some smaller cities. The average size of the population and the population density of the declining regions have changed dramatically during the inter-census period (2001–11). The average regional population size in 2011 was 1700 people with a population density of 31 persons/km^2. Only 10 years earlier, in 2001, the same regions inhabited on average 2270 people with a population density of 41 persons/km^2. In total these regions have lost more than 100,000 inhabitants, or 24.5% of their population.

The population of Lithuania increasingly concentrates in the major MAs,[22] although the total population of these areas also dropped by 6.2% between 2001 and 2011. Despite that, these MAs are the only macro-regional centres that still have potential to grow in the rapidly shrinking country. Apart from population decline, an important feature of declining areas is ageing of the population. The average age of the Lithuanian population increased from 37.7 to 41.5 years in a 10-year period, and the average age of the population in rapidly declining regions was 43.8 years in 2011.

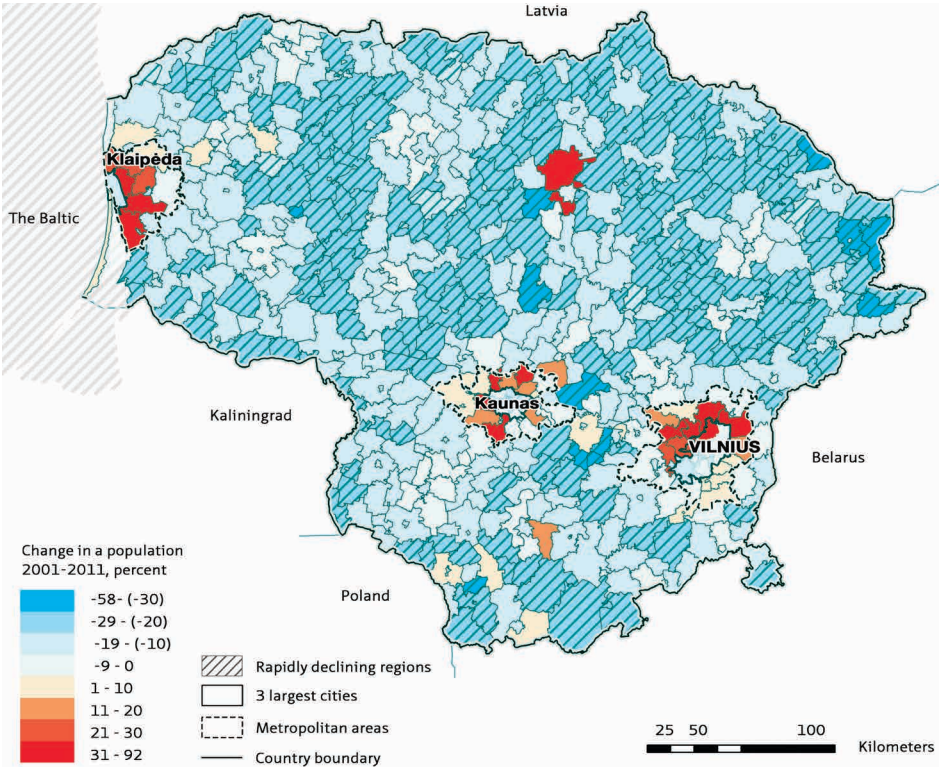

FIGURE 3.1 Population change in Lithuania in 2001-2011
Source: own calculations based on the 2001 and 2011 Lithuanian Census

Table 3.1 contains aggregated-level data and shows compositional differences between four groups of people living in Lithuania in 2011: all Lithuanians, residents of the MAs, residents of the rapidly declining regions and people who have moved out

22 There are three MAs in Lithuania, which contain cities and their suburban areas: Vilnius (635,480), Kaunas (392,313) and Klaipėda (210,635) (based on the 2011 Lithuanian census).

from the declining regions. The results show that compared with the national average, residents of the declining regions were older, less educated, less skilled, there were more unemployed persons and more people who received social benefits, more people working in the primary sector and fewer in services and public administration; also more residents of the rapidly declining regions owned their home and lived in single-family houses, mainly built before 1991. These differences are more pronounced when the declining regions are compared with the MAs.

Table 3.1 also shows that those who moved out form the declining regions were younger, better educated and more qualified than the average of rapidly declining regions. This suggests that the most 'successful' people are leaving declining regions, which increases the socio-demographic and economic gap between the rapidly declining regions and the rest of the country. In order to obtain more insight into the underlying processes, we compared the results of the 2001 and 2011 censuses. We found that in MAs the average age of the population has dropped and that the structure of the labour market became more oriented towards high-skilled jobs between 2001 and 2011. Meanwhile, in the declining areas, the share of elderly increased and the share of university educated and high-ranking occupations decreased. This shows evidence of an increasing polarization within Lithuania.

The results presented in Table 3.1 also imply that the demographic and economic capacity is running low in the rapidly declining regions, which could lead to a declining quality of life. However, our survey, which was completed right after the 2011 census, showed that 96% of people living in the declining regions are actually satisfied with their standard of living (Daugirdas et al., 2013). They appreciated the natural environment, the peace and quiet, and the geographical location of their places of residence. Most problems were associated with lack of employment opportunities and cultural entertainment. Two-thirds of respondents said that the prospects for the young are poor in the declining regions, and 15% of the residents were considering leaving their current place of residence in the near future, with the main reasons being employment related. A total of 51% of the respondents who expressed their intention to leave indicated that they wanted to move to the bigger cities in Lithuania, and 39% considered moving abroad. The results of the survey lead to the conclusion that the most sparsely populated and declining regions will continue to lose population in future. There are no indications of counterurbanization to offset population losses. A further decline of population will also affect the quality of life of those who stay as service provision will decline further. Currently, the population of the declining regions is still over 300,000 and it is a major challenge to ensure the standard of living in these regions stays sufficiently high, but at the same time is affordable. However, there is not much attention for regional development in Lithuania and there are no well-developed plans or strategies to cope with population shrinkage.

	TOTAL IN LITHUANIA	TOTAL IN LITHUANIA (%)	METROPOLITAN AREA (MA) (%)	DIFFERENCE BETWEEN MA AND TOTAL, %
Gender				
Male	522371	41.3	39.5	-1.8
Female	741603	58.7	60.5	1.8
Age (years)				
18-35	228669	18.1	24.0	5.9
35-49	331652	26.2	26.0	-0.2
50-64	336694	26.6	25.2	-1.4
>65	366959	29.0	24.8	-4.2
Ethnicity				
Lithuanian	1049863	83.1	72.7	-10.4
Non-Lithuanian	214111	16.9	27.3	10.4
Education				
Primary	121454	9.6	5.1	-4.5
Secondary	539046	42.6	37.6	-5.0
Tertiary	592959	46.9	56.9	10.0
Household size				
One member	401396	31.8	32.1	0.3
Two members	357924	28.3	27.5	-0.8
Three or four members	424610	33.6	34.9	1.3
Five and more members	80044	6.3	5.5	-0.8
Employment status				
Low-ranking occupation	194708	15.4	12.8	-2.6
Middle-ranking occupation	182781	14.5	17.2	2.7
High-ranking occupation	231315	18.3	25.6	7.3
Unemployed	124063	9.8	7.9	-1.9
Students	36537	2.9	4.7	1.8
Non-participating (over 65, housewives, disabled, missing)	494570	39.1	31.8	-7.3

	RAPIDLY DECLINING REGIONS (%)	DIFFERENCE BETWEEN RAPIDLY DECLINING REGIONS AND TOTAL (%)	DIFFERENCE BETWEEN RAPIDLY DECLINING REGIONS AND THE MA (%)	MOVED FROM RAPIDLY DECLINING REGIONS (%)	DIFFERENCE BE-TWEEN MOVED FROM RAPIDLY DECLIN-ING REGIONS AND RAPIDLY DECLINING REGIONS (%)
	46.9	*5.6*	*7.4*	**42.1**	*-4.8*
	53.1	*-5.6*	*-7.4*	**57.9**	*4.8*
	11.1	*-7.0*	*-12.9*	**55.6**	*44.5*
	23.9	*-2.3*	*-2.1*	**17.4**	*-6.5*
	26.2	*-0.4*	*1.0*	**12.9**	*-13.3*
	38.8	*9.8*	*14.0*	**14.0**	*-24.8*
	92.4	*9.3*	*19.7*	**95.6**	*3.2*
	7.6	*-9.3*	*-19.7*	**4.4**	*-3.2*
	19.8	*10.2*	*14.7*	**7.4**	*-12.4*
	49.2	*6.6*	*11.6*	**61.0**	*11.8*
	29.1	*-17.8*	*-27.8*	**31.0**	*1.9*
	34.9	*3.1*	*2.8*	**50.0**	*15.1*
	28.5	*0.2*	*1.0*	**22.1**	*-6.4*
	27.7	*-5.9*	*-7.2*	**24.0**	*-3.7*
	8.9	*2.6*	*3.4*	**3.9**	*-5.0*
	17.2	*1.8*	*4.4*	**14.4**	*-2.8*
	8.3	*-6.2*	*-8.9*	**11.0**	*2.7*
	7.2	*-11.1*	*-18.4*	**11.7**	*4.5*
	12.4	*2.6*	*4.5*	**14.5**	*2.1*
	1.4	*-1.5*	*-3.3*	**22.0**	*19.1*
	53.6	*14.5*	*21.8*	**26.5**	*-12.6*

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	TOTAL IN LITHUANIA	TOTAL IN LITHUANIA (%)	METROPOLITAN AREA (MA) (%)	DIFFERENCE BETWEEN MA AND TOTAL, %
Economic branch				
Primary	36167	2.9	1.0	-1.9
Industry	104328	8.3	7.7	-0.6
Construction	37257	2.9	3.0	0.1
Traditional services	156994	12.4	15.7	3.3
Business services	32499	2.6	4.5	1.9
Public administration	223856	17.7	21.9	4.2
Other and missing	17703	1.4	1.8	0.4
Incomes source				
Social benefits	97568	7.7	6.6	-1.1
Ownership				
Own	1049814	83.1	80.5	-2.6
Rent	212503	16.8	19.3	2.5
Housing type				
One/two-dwelling apartment	493604	39.1	20.8	-18.3
Apartment building	749401	59.3	76.2	16.9
Year of construction				
Before 1991	1066263	84.4	78.1	-6.3
After 1991	168012	13.3	18.6	5.3

NOTE: percentages may not total 100 due to not included categories and missing values.

TABLE 3.1 The composition of population of Lithuania, metropolitan areas, rapidly declining regions, and composition of people who have moved out from

	RAPIDLY DECLINING REGIONS (%)	DIFFERENCE BETWEEN RAPIDLY DECLINING REGIONS AND TOTAL (%)	DIFFERENCE BETWEEN RAPIDLY DECLINING REGIONS AND THE MA (%)	MOVED FROM RAPIDLY DECLINING REGIONS (%)	DIFFERENCE BE-TWEEN MOVED FROM RAPIDLY DECLIN-ING REGIONS AND RAPIDLY DECLINING REGIONS (%)
	7.9	*5.0*	*6.9*	**3.0**	*-4.9*
	5.3	*-3.0*	*-2.4*	**6.7**	*1.4*
	1.8	*-1.1*	*-1.2*	**4.1**	*2.3*
	6.3	*-6.1*	*-9.4*	**10.1**	*3.8*
	0.5	*-2.1*	*-4.0*	**1.2**	*0.7*
	10.2	*-7.5*	*-11.7*	**10.7**	*0.5*
	0.6	*-0.8*	*-1.2*	**1.3**	*0.7*
	9.4	*1.7*	*2.8*	**15.0**	*5.6*
	85.9	*2.8*	*5.4*	**36.4**	*-49.5*
	13.9	*-2.9*	*-5.4*	**62.9**	*49.0*
	79.9	*40.8*	*59.1*	**25.5**	*-54.4*
	19.5	*-39.8*	*-56.7*	**59.4**	*39.9*
	92.8	*8.4*	*14.7*	**74.4**	*-18.4*
	4.8	*-8.5*	*-13.8*	**10.6**	*5.8*

the declining regions, 2011 (>=18 years old, only reference persons).

Who lives in the rapidly declining regions?

The aggregated-level data gave some first insights into the population composition of the regions of Lithuania. In this section we show the results of a series of binary logistic regression models that estimate the probability that someone lives in the rapidly declining region in 2011 compared with living in other regions of Lithuania (Table 3.2). These are descriptive models (as opposed to causal models) that give an indication of the role of each variable, while controlling for others. The dependent variable indicates if someone lives in a rapidly declining (losing 20% of the population or more between 2001 and 2011) region (1) or not (0). The models include a range of individual and regional-level variables. As in subsequent models, these models include only reference persons aged 18 years and older.

Model 1 includes socio-demographic characteristics. First, the model shows that the probability of living in declining regions strongly increases with age. It also shows that Lithuanians are 2.8 times more likely to live in the declining regions than other ethnic groups. This can be explained by the fact that ethnic minorities are mostly concentrated in the cities, and especially in the Vilnius city-region (Ubarevičienė, Burneika, & van Ham, 2015). Model 1 also shows that single-person households and households with five or more members are more likely to live in declining regions than in other regions. This latter effect has been confirmed by other research (Albrecht & Albrecht, 1996; Rogers, 1996). In addition, the model shows that with increasing levels of education, the likelihood of living in declining regions decreases rapidly: secondary educated people are 1.8 times and higher educated people are 3.6 times less likely to live in declining regions. Since women are overrepresented among the reference persons in the declining regions, the interpretation of the gender differences in the models would be biased, and only serves as a control variable.

In model 2 we included employment status variables. The results show that those with a job in the primary sector had the highest odds of living in rapidly declining regions, and those working in the service sector and students had the lowest odds. This is not surprising since the majority of the declining regions are rural areas, thus agriculture plays an important role there. It is interesting that unemployed residents, compared with those non-participating in the labour market, were less likely to live in the declining regions. We found an opposite relationship for the rest of the country. This could be associated with the higher share of pensioners in shrinking regions, which fall within the category of non-participating. The results also showed that those having low-skilled jobs had the highest odds of living in declining regions and those having high- skilled jobs had the lowest odds (not included into the models due to overlap with the variables education and labour market position). Including labour market position in model 2 also affected the effects of age compared with model 1.

After controlling for employment status, the effect of the age composition diminished, especially for the oldest age group. This suggests that part of the original age effect on living in a declining area is actually an employment status effect. Meanwhile the effect of other socio-demographic characteristics hardly changed compared with model 1.

In model 3 we added housing characteristics. The results show that there is a positive effect of homeownership on the probability of living in the declining region, while the effect of living in an apartment building or more recently built dwelling was negative. The latter results are not surprising and they coincide with the descriptive data in Table 3.1. The effects of age and household size have nearly turned over once we controlled for housing characteristics. It can be explained by the high share of owner-occupied single-family houses. Including housing characteristics in model 3 reduced some of the effects of the other variables compared with model 2, but it increased the fit of the model considerably with a Nagelkerke pseudo-R^2 of 0.234 in model 3.

Several regional-level variables were added in model 4 to estimate the relationship between regional characteristics and the probability to live in a rapidly declining region. The results show that people living further away from regional centres are more likely to live in a declining region, although this effect is small when we control for other characteristics. People who lived in border regions also showed a higher propensity to live in declining regions (no significant differences were found between European Union and non-European Union borders). The results also show a correlation between living in a region with a high unemployment rate (compared with country averages between 2001 and 2011) and living in one of the rapidly declining regions. Also an increasing unemployment rate (between 2001 and 2011) was associated with living in a declining region. The results also show that living in a region with a high share of jobs in the primary sector and a low share of jobs in the service sector, and living in a region with an increase in the primary sector and a drop in the service sector jobs, is associated with living in a rapidly declining region. It is noteworthy that after controlling for regional-level variables in model 4, the differences between the categories of variables on the individual-level, such as education and labour market position, reduced. This suggests that regional-level characteristics jointly explain the essence of declining regions; high and increasing unemployment, and a low percentage of service jobs. The fit of the final model improved considerably with a Nagelkerke pseudo-R^2 of 0.562.

	MODEL 1		
	B	SE	EXP (B)
Individual-level variables			
Gender (reference = male)			
Female	-0.280	0.006	**0.755**
Age (years) (reference = 18-34)			
35-49	0.490	0.010	**1.632**
50-64	0.636	0.010	**1.888**
>65	0.600	0.011	**1.822**
Ethnicity (reference = non-Lithuanian)			
Lithuanian	1.032	0.010	**2.807**
Household size (reference = one member)			
Two members	-0.084	0.007	**0.919**
Three or four members	-0.123	0.008	**0.884**
Five and more members	0.369	0.012	**1.447**
Education (reference = primary)			
Secondary	-0.596	0.009	**0.551**
Tertiary	-1.296	0.010	**0.274**
Labour market position (reference =non-participating)			
Primary sector			
Industry sector			
Construction sector			
Service sector			
Public administration sector			
Other and missing			
Unemployed			
Students			
Ownership (reference = rent)			
Own			
Housing type (reference = one/ two dwelling apartment.)			
Apartment building			
Year of construction (reference = before 1991)			
After 1991			

	MODEL 2			MODEL 3			MODEL 4		
	B	SE	EXP (B)	B	SE	EXP (B)	B	SE	EXP (B)
	-0.259	0.006	**0.772**	-0.090	0.006	**0.914**	-0.024	0.008	**0.976**
	0.338	0.011	**1.403**	0.151	0.012	**1.163**	0.060	0.014	**1.062**
	0.326	0.011	**1.386**	0.030	0.012	**1.030**	0.008	0.015	**1.008**
	0.038	0.013	**1.039**	-0.275	0.014	**0.759**	-0.018	0.018	**0.983**
	1.002	0.011	**2.723**	0.872	0.011	**2.392**	0.524	0.014	**1.689**
	-0.083	0.007	**0.920**	-0.160	0.008	**0.852**	-0.134	0.010	**0.874**
	-0.112	0.008	**0.894**	-0.280	0.008	**0.756**	-0.237	0.011	**0.789**
	0.286	0.012	**1.331**	-0.134	0.012	**0.875**	-0.308	0.015	**0.735**
	-0.583	0.009	**0.558**	-0.303	0.010	**0.738**	-0.055	0.012	**0.947**
	-1.158	0.010	**0.314**	-0.703	0.011	**0.495**	-0.078	0.014	**0.925**
	0.839	0.014	**2.314**	0.599	0.015	**1.820**	-0.142	0.018	**0.868**
	-0.780	0.014	**0.458**	-0.587	0.015	**0.556**	-0.146	0.018	**0.864**
	-0.912	0.022	**0.402**	-0.692	0.023	**0.501**	-0.192	0.028	**0.825**
	-1.037	0.013	**0.354**	-0.815	0.014	**0.443**	-0.141	0.017	**0.868**
	-0.686	0.012	**0.503**	-0.490	0.012	**0.613**	-0.084	0.015	**0.919**
	-1.029	0.035	**0.357**	-0.800	0.036	**0.449**	-0.273	0.045	**0.761**
	-0.120	0.011	**0.887**	-0.051	0.012	**0.951**	0.029	0.015	**1.029**
	-1.117	0.028	**0.327**	-1.220	0.028	**0.295**	-0.272	0.036	**0.762**
				0.276	0.009	**1.318**	0.220	0.012	**1.246**
				-1.915	0.007	**0.147**	-0.143	0.010	**0.867**
				-1.209	0.014	**0.298**	-0.275	0.016	**0.760**

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	MODEL 1		
	B	SE	EXP (B)
Regional-level variables (on LAU 2 regions)			
Distance to municipal centre (km)			
Country border region (reference = no)			
Unemployment rate (ref = below average)			
Change in unemployment rate (reference = decrease)			
Percentage jobs in primary sector			
Percentage jobs in service sector			
Change in percentage jobs in primary sector			
Change in percentage jobs in service sector			
Constant	-2.499	0.017	
R^2 (Negelkerke)	**0.074**		
-2 LL	831,691.347		

Notes:
N_{total} *= 1,263,937;*
$N_{rapidly\ declining}$ *= 139,578.*
Dependent variable = population change (1 = regions that lost more than 20% of population, 0 = the rest).
Not provided are significance levels because the complete sample of population is analysed.

TABLE 3.2 Logistic regression model of living in the rapidly declining region in 2011 at the individual-level.

	MODEL 2			MODEL 3			MODEL 4		
	B	SE	EXP (B)	B	SE	EXP (B)	B	SE	EXP (B)
							0.076	0.001	**1.079**
							0.255	0.012	**1.290**
							0.902	0.008	**2.464**
							0.513	0.009	**1.671**
							0.036	0.000	**1.037**
							-0.145	0.001	**0.865**
							0.012	0.001	**1.012**
							-0.053	0.001	**0.948**
	-1.934	0.019		-1.310	0.020		-0.440	0.044	
	0.106			**0.234**			**0.562**		
	810,799.061			721,725.423			460,800.075		

Who leaves the declining regions and where do people go?

Next, we model leaving rapidly declining areas using multinomial logistic regression (Table 3.3). We distinguished between three categories of people: (1) reference category – persons who did not move from the rapidly declining regions[23]; (2) persons who moved into population-'winning' regions; and (3) persons who moved into population-'losing' regions. The average change in population between 2001 and 2011 at the LAU-2 level was −14.1%, so we defined 'winning' regions as those that lost less than the average, and 'losing' if they lost more than the average. In total, there were 1605 reference persons who left declining regions between 2010 and 2011. To our surprise, 990 persons moved into 'loosing' regions and 615 moved into 'winning' regions. Like in the previous model, this model includes individual and regional-level variables.

The distribution of migrants according to population change in the destination regions is shown in Figure 3.2. Most of the people moved to regions that lost between 10% and 20% of their population. It is interesting that migrants who moved from the rest of the country showed a similar pattern, although the curve is more to the left. It means that relatively more people moved into 'winning' regions, but the majority of residents moved into the areas that have negative population change. This spatial pattern of internal migration might be a result of the global financial crisis, since studies in Lithuania as well in other post-socialist countries have shown that the general long-term pattern of internal migration in the last two decades leads to concentration (metropolization) and peripheralization (Borén & Gentile, 2007; Ehrlich et al., 2012; Lange, 2015). Moreover, according to census data, the number of internal migrants is very small in Lithuania, which might also be caused by the global financial crisis. Another reason might be the high homeownership rate: 83.2% of the reference persons in Lithuania and 86.1% in the rapidly declining regions lived in their own dwellings in 2011. In addition, people do not always report the change of their residence (see also Sjöberg & Tammaru, 1999). Since the registration of the residence is voluntary and the place of residence is not directly linked with other institutions (e.g., healthcare), not updating your address does not have any legal consequences.

23 Due to data limitations discussed in the data and methods section, this category also includes intra-urban or intra-rural migrants.

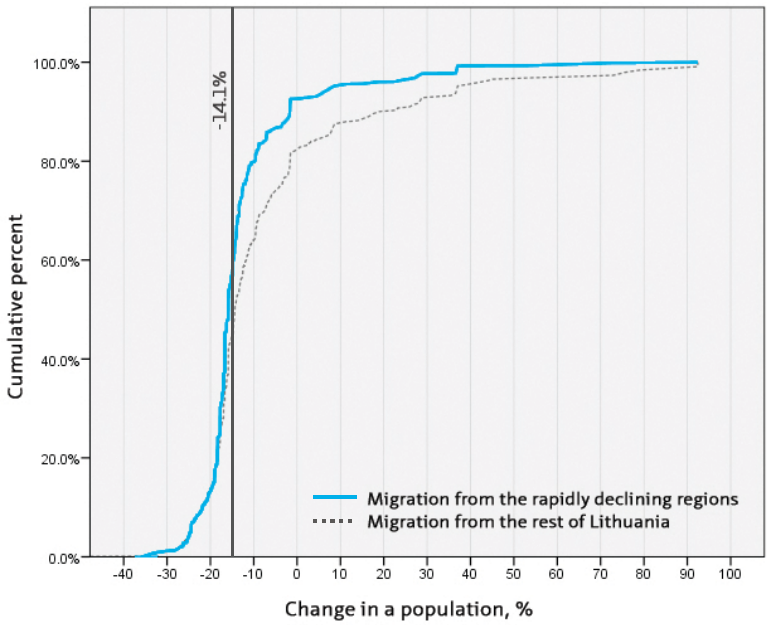

FIGURE 3.2 Distribution of migrants according to the population change in the region of destination
Source: Based on the 2011 Lithuanian Census

The results of the multinomial model in Table 3.3 show that the probability of migration out of rapidly declining regions decreases with age, where people aged between 18 and 34 years have much higher probabilities of leaving the rapidly declining regions than other age groups. This is in line with the results of the above-mentioned survey. Although the general trend is very similar between the two directions of migration, those who move to 'winning' regions are relatively younger. The model also shows that in general Lithuanians were more likely to move than others, but when we take into account the direction of migration, Lithuanians were more likely to have moved into 'losing' regions while there are no differences between ethnic groups with regard to moving into 'winning' regions.

When interpreting the subsequent results, we have to keep in mind that for the time-varying variables (household size, education, position in the labour market, housing) we only know information for 2011 – after migration. This is a consequence of the use of individual-level census data. The model shows that there is a direct linear relationship between household size and migration: individuals who now (in 2011) live in smaller households were more likely to move out and those living in the large families where more likely to stay in the declining regions. This finding can be explained by family ties and related commitments (Feijten & van Ham, 2007; Wagner & Mulder,

2015). As in the case of age, the relationship between household size and migration is more explicit for individuals moving into 'winning' regions. Moreover, the higher the level of education a person has, the more likely that they have moved from a rapidly declining region. It is especially having a tertiary education that leads to a higher probability of moving into 'winning' regions.

People who now (in 2011) work in the primary sector were the least likely to move to both 'losing' and 'winning' regions. On the contrary, those who are now working in construction and services were more likely to leave declining regions and move to 'winning' regions. Moreover, those who work in public administration were less likely to move to 'losing' regions and those who work in industry were more likely to move to 'winning' regions. The results show that the effect of unemployment was small, although people who were unemployed in 2011 were less likely to have moved to 'winning' regions. These are valuable results, taking into account that many studies do not find a clear relationship between unemployment rates and out-migration. The model also shows that the probability of migration was higher if the person was a student in 2011 (we do not know if he/she was a student before migration, however, universities are concentrated in the biggest cities). The results also showed (data not shown) that people who now have high-ranking positions in the labour market were more likely to migrate, especially to the 'winning' regions. It means that skilled people benefit the most from migration, which is consistent with what was found in the literature review.

We have also controlled for housing characteristics. The results show that at the time of the census (2011), people who rent a house were most likely to have moved and those who are still in the declining regions were most likely to own (however, we do not know the ownership status before the move). Individuals who now live in apartment buildings as well as in the more recently built dwellings were more likely to have left, and this probability is higher for those who moved into the 'winning regions'. In other words, after migration from shrinking regions, most of the people do not own a house and often live in apartment buildings and more recently built dwellings.

Lastly, we controlled for (changes in) the unemployment rate of the origin region, which should reveal what the role is played by the regional context on the probability of leaving the shrinking regions and the destination of migration. An important finding is that the probability of migration increases with higher unemployment rates in regions of origin and this probability is even higher if the region experienced an increase in unemployment rate over the last decade. Although it means that higher unemployment rates increase the probability of leaving declining regions, those who were unemployed in 2011 were less likely to move to 'winning' regions, which were losing jobs at the time of the census. This is similar to what Tervo (2000) found in the

case of Finland. We did not find effects of distance to the bigger cities or effects of the labour market structure in the region of origin on migration behaviour. In addition, the results showed (data not shown) that the effect of migration distance is small when moving to 'losing' or 'winning' region, but people tend to migrate over longer distances when they move to the major cities (especially to Vilnius), and the shortest distances when the destination is a rural area.

To summarize, the multinomial models shows that younger, better educated Lithuanians and singles were most likely to move out from rapidly declining regions. Therefore, we can state that migration flows from the declining regions are highly selective, with relatively more 'successful' people showing a higher probability to move out. A high unemployment rate is also an important factor related to the decisions to leave rapidly declining regions. Moreover, migrants have different propensities to move into the 'losing' and 'winning' regions. Although the contrast is less pronounced than we could have been expecting, we found that relatively younger and highly educated people and those who live in smaller households are more inclined to move to the 'winning' regions. We did not find that those who are unemployed, uneducated and experiencing the worst living conditions were likely to move out from declining regions. This means that those who should have the greatest motivation to leave remain in the declining regions, thus reducing the attractiveness of such regions and increasing the burden on social support structures. Meanwhile, the out-migration of the younger and better educated population decreases the jobs supply and entrepreneurial capacities of declining regions, which already suffer from lack of labour supply and human capital.

Interestingly, the data also showed a group (11% of those who moved) who moved from one rapidly declining region to another. This group of movers deserves some specific attention as they moved in the opposite direction of what economic theory would predict. We ran some additional regression models (data not shown) to examine their individual characteristics and found that compared with other movers, those who move to other declining areas are more likely to be middle aged, non-Lithuanian, living in large households, holding primary education only and unemployed. This illustrates that declining areas are hit two ways as they both loose young educated people and they receive older, worse educated and unemployed migrants.

	MOVED TO 'LOOSING' REGION				MOVED TO 'WINNING' REGION			
	B	S.E.	EXP (B)	95% CI	B	S.E.	EXP (B)	95% CI
Individual-level variables								
Gender (reference = male)								
Female	0.124	0.076	**1.132**	0.98-1.31	0.252	0.107	**1.287**	1.04-1.59
Age (years) (reference = 18-34)								
35-49	-1.117	0.098	**0.327**	0.27-0.40	-1.293	0.139	**0.274**	0.21-0.36
50-64	-1.45	0.117	**0.235**	0.19-0.30	-1.55	0.162	**0.212**	0.15-0.29
>65	-1.477	0.147	**0.228**	0.17-0.31	-1.609	0.218	**0.200**	0.13-0.31
Ethnicity (reference = non Lithuanian)								
Lithuanian	1.008	0.199	**2.740**	1.86-4.05	-0.019	0.179	**0.981**	0.69-1.40
Household size (reference = one member)								
2 members	-0.206	0.090	**0.814**	0.68-0.97	-0.613	0.129	**0.542**	0.42-0.70
3 or 4 members	-0.580	0.093	**0.560**	0.47-0.67	-0.853	0.127	**0.426**	0.33-0.55
5 and more members	-0.849	0.169	**0.428**	0.31-0.60	-1.189	0.262	**0.305**	0.18-0.51
Education (reference = primary)								
Secondary	-0.083	0.135	**0.920**	0.71-1.20	0.093	0.218	**1.097**	0.72-1.68
Tertiary	0.396	0.142	**1.485**	1.13-1.96	0.679	0.225	**1.971**	1.27-3.06
Labour market position (reference =non-participating)								
Primary sector	-0.564	0.197	**0.569**	0.39-0.84	-0.462	0.305	**0.630**	0.35-1.15
Industry sector	-0.061	0.157	**0.941**	0.69-1.28	0.194	0.218	**1.214**	0.79-1.86
Construction sector	0.526	0.205	**1.692**	1.13-2.53	1.135	0.255	**3.110**	1.89-5.13
Service sector	0.137	0.138	**1.147**	0.88-1.50	0.483	0.190	**1.620**	1.12-2.35
Public administration sector	-0.312	0.143	**0.732**	0.55-0.97	0.041	0.194	**1.042**	0.71-1.53
Unemployed	0.006	0.121	**1.006**	0.79-1.28	-0.084	0.190	**0.920**	0.63-1.33
Students	0.702	0.163	**2.017**	1.47-2.78	1.115	0.211	**3.051**	2.02-4.61
Ownership (reference = rent)								
Own	-1.718	0.077	**0.180**	0.15-0.21	-1.718	0.107	**0.179**	0.15-0.22
Housing type (reference = one/two dwelling apartment)								
Apartment building	1.76	0.078	**5.813**	4.99-6.77	2.081	0.117	**8.012**	6.38-10.07
Year of construction (reference = before 1991)								
After 1991	0.718	0.122	**2.050**	1.61-2.61	1.374	0.136	**3.950**	3.03-5.15
Regional-level variables (on LAU 2 regions)								
Unemployment rate (reference = below average)	0.489	0.076	**1.631**	1.41-1.89	0.608	0.104	**1.836**	1.50-2.25
Change in unemployment rate (reference = decrease)	1.157	0.078	**3.179**	2.73-3.71	1.459	0.114	**4.302**	3.44-5.38

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	MOVED TO 'LOOSING' REGION				MOVED TO 'WINNING' REGION			
	B	S.E.	EXP (B)	95% CI	B	S.E.	EXP (B)	95% CI
Intercept	-6.807	0.317			-7.675	0.410		
N	878				456			

Notes: Persons who did not move from the rapidly declining regions constitute the reference category. The dependent variable is according to the average population change in the country between 2001 and 2011 (-14.1%).
–2 Log-likelihood final = 7167.279. R^2 (Nagelkerke) = 0.273.
Not provided are significance levels because the complete sample of population is analysed.

TABLE 3.3 Multinomial logistic regression results.

§ 3.6 Conclusions and discussion

The paper explored recent processes of socio-spatial change and the role of selective migration in Lithuania. The main focus is on understanding who lives in the most rapidly declining regions and who is most likely to leave these regions. The study contributes to the existing literature by integrating population decline, migration and socio-spatial polarization, which are particularly common in post-socialist CEE countries. Although many studies emphasize increasing socio-spatial polarization in CEE countries, little is known about the composition of internal migration flows, which is the main reason for the aforementioned emergence of regional differences. In this paper, we provide solid empirical results on how these differences appear due to selective migration processes. It is also the first study to use individual-level Lithuanian census data to analyse migration, while very few studies have been done in other CEE countries, making this study of wider interest. On the other hand, the case of Lithuania is of special interest due to the history of the development of its settlement structure. It was established during the Soviet period, and the planning policy has been focused on decentralization and sought to limit the growth of the major cities. Moreover, rural–urban migration, which has long been the prevailing direction of migration in many countries, was restricted in Lithuania until the early 1990s. Therefore, we believe that the contemporary migration flows and population redistribution partially compensate for the previous restrictions on residential mobility.

Our analysis showed that older, less educated people, those working in the primary sector, and those who are unemployed, or not participating in the labour market, are the most likely to live in the most declining areas. Meanwhile, younger and single individuals with higher levels of education and better positions in the labour market are the most likely to leave depopulating areas. We also found evidence of migration selectivity by migration destination: relatively younger and higher educated individuals and those who live in smaller households are more inclined to move into 'winning' regions than to the 'losing' ones. The probability to move out increases with higher rates of unemployment in the region of origin. Although we do not know whether those who moved out were unemployed before migration, they were less likely to be unemployed after they had moved. These are important findings, since many studies do not find clear links between migration and unemployment. We also found that distance to the major cities does not have an impact on migration behaviour, though the more declining regions are the more peripheral ones. This could be related to the polycentric urban system of Lithuania. It could also mean that anyone who has the potential to leave has already left and the population is decreasing due to negative natural change. But it could also be the effect of the global financial crisis, which temporarily affected the spatial pattern of internal migrations. All our findings suggest that human, social and economic capital is running low in the rapidly declining regions. Moreover, the out-migration of the most 'successful' people and increasing concentration of the less 'successful' increases the gap of socio-demographic and economic differences between the rapidly declining regions and the rest of the country and leads to a spatially unbalanced development.

Uneven spatial development is a central feature of capitalist development and therefore it is typical of many countries. However, in Lithuania it is accompanied by extreme rates of population decline, thus the consequences can be expected to be profound. Despite that, there is not much attention for regional development in Lithuania and there is no policy dealing with declining regions. We could only speculate and try to guess how the declining regions of Lithuania will develop further if no action is taken. One of the most likely scenarios is that population decline will continue. The recovery of the population is only possible in a limited number of regions that can find niche markets (e.g., recreation or retirement). In contrast to popular belief, we believe that the shrinkage of these regions in Lithuania is inevitable and that out-migration gives better education and career opportunities for migrants, especially for those whose qualification can hardly be used in the shrinking agricultural labour market. It is probably not possible or even desirable to prevent further out-migration, but it is important to ensure the standard of living for those who are left behind in the declining regions. The experiences of other countries have shown that the best strategy to cope with shrinkage is through the encouragement of local incentives and citizen participation. Currently it is hardly practised in Lithuania, but the role of

local communities is slowly increasing as a result of European Union support. The establishment of local self-governance might help to manage the structural processes of shrinkage.

Although our study has shortcomings, mainly related to data constraints, it is an important step on the path to a better understanding of internal migration and depopulation processes in post-socialist countries. Future empirical work should focus on selective migration by destination in order to get a better insight into the process of socio-spatial polarization. Also qualitative studies should be done in order to investigate further the living conditions and needs of the population in declining regions.

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4 Ethno-political effects of suburbanization in the Vilnius urban region: An analysis of voting behaviour

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Abstract

We use electoral data to analyze the ethno-political consequences that may arise from the fact that the region surrounding the city of Vilnius is dominated by residents with a Polish identity, while those who move to the suburbs are mainly ethnic Lithuanians. In the suburban ring we found increasing voting turnout, a decreasing share of votes for the Polish party, and an increase of the absolute number of votes for this party. The changing electoral behavior might be an indicator of growing ethno-political tensions and the zones of the most intense changes identify areas of potential social tensions between ethnic groups.

Keywords

Suburbanization; ethnicity; conflict; voting behavior; electoral data; Lithuania

§ 4.1 Introduction

Political reforms in the early 1990s in the former socialist countries of Central and Eastern Europe led to major economic and social changes. These transformations have a clear expression in the spatial development of the major cities of post-communist Europe (Hamilton, Andrews, & Pichler-Milanovic, 2005; Timár & Váradi, 2001). Suppressed urbanization and rural retention during the Soviet period resulted in

major changes in land use patterns after the introduction of the market economy in these states (Bertaud & Renaud, 1997; Borén & Gentile, 2007). One of the most significant features of this spatial process was urban expansion through the process of suburbanization (Kok & Kovács, 1999; Leetmaa & Tammaru, 2007; Novák & Sýkora, 2007; Nuissl & Rink, 2005; Ouředníček, 2007; Tammaru, Leetmaa, Silm, & Ahas, 2009). Like many other formerly centrally planned cities in Europe, also Vilnius – the capital of Lithuania – is undergoing rapid suburbanization, a process which started right after 1990 (see Brade, Herfert, & Wiest, 2009; Cirtautas, 2013; Ubarevičienė, Burneika, & Kriaučiūnas, 2011). The processes of urban sprawl and outward mobility in Vilnius are quite similar to what can be observed in other post-Soviet countries (Borén & Gentile, 2007; Krišjāne & Bērziņš, 2009; Novák & Sýkora, 2007).

What makes the case of Vilnius specific is the ethnic landscape of the central city and the region surrounding the city. Due to historical reasons, the region surrounding Vilnius is dominated by ethnic minority groups (with a prevalence of Poles), and it is regarded as the most multinational region of Lithuania (S. Stanaitis & Česnavičius, 2010). Ethnic minorities comprise 37% of the Vilnius city population and approximately 65% of the recent suburbanization zone (Statistics Lithuania, 2012). In addition, the ratio of different national groups differs considerably between the central city and the region surrounding it. Although Poles comprise around half of the population in the zone of suburbanization, they form a clear majority in the areas that are still unaffected by suburbanization (more than 90% in some LAU 2 regions) and less than one-fifth in the central city. What makes Vilnius unusual in an international context is that the spatial pattern of ethnic composition is the opposite of what can be found in many other European cities where the central city has a high share of ethnic minorities and where the commuter ring around the city is dominated by the titular ethnic group.

The recent process of suburbanization around Vilnius, which takes place in the territories predominated by ethnic minorities, might cause ethnic tensions. As has been observed in many other countries (Bonvalet, Carpenter, & White, 1995; Clark, 2006; Hiebert, 2000; Simpson & Finney, 2009; Tammaru, van Ham, Leetmaa, Kährik, & Kamenik, 2013), the ethnic majority population is often overrepresented among those who suburbanize. This is not different in the case of Vilnius where Lithuanians suburbanize to the surrounding city region where Polish identity residents are traditionally the largest group. The outward expansion of Vilnius city results in a confrontation of ethnic groups in the suburbs, with partly different needs, priorities, worldviews, quality of life standards, and value systems (Burneika & Ubarevičienė, 2011). Ethnic, social, economic, and political contrasts are evident between the old residents of the city region and the newcomers. That the encounter of the two groups can lead to potential conflicts is illustrated by increasing media attention on the

growing political activity of the Polish minority in the Vilnius region and possible links with the ethnic dimensions of the ongoing suburbanization process.

The aim of this paper is to explore the ethno-political effects of suburbanization in the Vilnius region by studying voting behavior. As George, Moser, and Papic and colleagues (2010) argue, a strong salience of group identity can be revealed through political action. The vast majority of ethnic minorities in the region surrounding Vilnius city support the Polish political party, which acts almost exclusively in their interest. We expect that the suburbanization process and voter migration might have consequences for electoral results in the surrounding city region. We hypothesize that the number of votes for the Polish party and voting turnout will increase in the suburban ring because of the mobilization of Poles, aiming to strengthen their political influence during a time when others enter the region. By analyzing changes in voting behavior we will also identify the zones where future ethno-political tensions are the most likely. This study uses electoral data of the 1997 and 2011 municipality elections. The Lithuanian Census of 1989, 2001, and 2011 provide us with information about population change and ethnic composition. The smallest possible statistical units – voting districts and *seniūnija* (LAU 2 level) are used to give precise territorial data. Cartographical analysis and statistical techniques are used to investigate the correlations between socio-spatial transformations and voting behavior in the Vilnius urban region. The cartographical approach has an important added value because of the geographical nature of the topic under study. The approach is capable of identifying (changes in) spatial patterns of population distribution and voting behavior.

§ 4.2 Theoretical background

There are many different factors that influence the electoral behavior of people and shifts in such behavior over time. The most relevant factors are differences in social structure, public opinion, economic and political conditions, and characteristics of the political parties involved (Lubbers, Gijsberts, & Scheepers, 2002). There is a substantial body of literature that investigates the causal relationship between ethnicity and voting behavior. Wolfinger (1965) argues that ethnicity plays a major role in politics, and it is often an important independent variable in voting behavior. The presence of ethnic voting has been confirmed by many studies (see, e.g., Chernyha & Burg, 2012; Crowley, 2001; Medrano, 1994; Walks, 2006). It is common that ethnic minorities have different political preferences and support different political parties than the rest of the population. That is especially likely if there are political parties that appeal exclusively

to a particular ethnic group. In this case, a political cleavage might emerge (see Lipset & Rokkan, 1967 on cleavage formation). Lawson (1999) defines cleavages as 'long-term structural conflicts that give rise to opposing political positions, which may or may not be represented by parties.'

Numerous studies have also noted that ethnic minorities are less likely to vote than the majority population (Bullock & Hood, 2006; Crowley, 2001; Fennema & Tillie, 2001; Togeby, 1999; van Heelsum, 2005). However, if political parties representing the interests of ethnic minorities join the elections, this might mobilize ethnic minority voters to express their political views more actively in order to gain greater sociopolitical influence (Chandra & Wilkinson, 2008; George et al., 2010; Wolfinger, 1965). According to Crowley (2001), political participation of ethnic minorities can also reflect their identity processes.

Electoral geography literature pays increasing attention to the effects of migration on electoral results (Halla, Wagner, & Zweimüller, 2012; Robinson & Noriega, 2010). In countries or regions with relatively high levels of (international) immigration, native residents who feel threatened often vote for right-wing political parties, which proclaim anti-immigrant attitudes in their programs, in an attempt to protect their labor market and safeguard their own cultural identity (Arzheimer, 2009; Lubbers et al., 2002). Meanwhile, immigrants support liberal or ethnic parties representing their interests. Such political battles are going on in many western European countries. Voting results can also be influenced by more local level migration flows, for example, migration from the city to the suburbs. Walks (2004, 2005, 2006) has shown that there is an increasing polarization in terms of political attitudes and party preferences between the inner cities and the suburbs in the United States, Canada, and Great Britain. The outward expansion of cities may lead to a shift in the balance of political power in their suburbs as new residents arrive with different political preferences. This may cause more active political involvement of the original residents of the region surrounding the city in order to keep their political dominance. Such a process can be expected to be more pronounced if there are ethnic differences between newcomers and the original population, such as the case in the city region of Vilnius. Although the voting behavior of ethnic minorities in Lithuania had been analyzed by authors such as Ramonaitė, Matulevičius and Degutis (2007) and Degutis (2002), no research has investigated the potential effects of suburbanization on electoral results.

In the next section we will discuss the sociospatial transformations which took place in the Vilnius region during the last few decades, starting with a brief history of the region.

§ 4.3 Sociospatial transformations in the Vilnius urban region

Ethnic composition of the Vilnius region

Currently, more than 90% of Polish identity residents in Lithuania are concentrated on 8% of the land mass, which is the Vilnius region. The contemporary presence of Poles, the most numerous ethnic minority group in the Vilnius region, is strongly rooted in history. The Polish population reached its peak during the period of Polish governance in the Vilnius region between 1920 and 1939. This period showed a strong growth of the Polish population as well as a strengthening Polish identity of local residents throughout Vilnius region. Simultaneously, the rest of Lithuania was an independent state from 1918 to 1940, which strengthened the Lithuanian identity across this part of the country. Just before the Second World War, Lithuanians made up about 10% of the population in the Vilnius region and more than 80% in the rest of the country (Gaučas, 1997).

The Second World War marked the end of Polish governance and the beginning of the Soviet period. This shift in power was accompanied by Polish repatriation, especially from the city of Vilnius (Daukšas, 2008; Eberhardt, 2006; Stravinskienė, 2004). At the same time, mass industrialization, which began soon after the start of the Soviet occupation, accelerated the growth of Vilnius city. The population of the city increased 3.4 times from 1950 to 1989 (A. Stanaitis, 2003; S. Stanaitis & Česnavičius, 2010; see also Enyedi, 1996; Krišjāne & Bērziņš, 2009; Sýkora & Ouředníček, 2007 on industrialization in Soviet cities). Vilnius city received immigrants from other parts of Lithuania and from more remote areas of the Soviet Union. Hence, the ethnic differences between Vilnius city and the rest of the country reduced during the Soviet period. At the same time, the effects of the Second World War and the Soviet regime were relatively weak on the region surrounding Vilnius city, and the population of this region continued to consist primarily of Polish residents.

The ethnic structure of the Vilnius region underwent one more period of change in recent history: in the period since the restoration of Lithuanian independence in 1990[24]. Like in many other post-Soviet cities, part of the Russian-speaking residents

24 During the political reforms around 1989-1990, the citizenship act was introduced in Lithuania. According to this act all permanent residents of the territory of Lithuania, regardless of their countries of origin, were able to acquire Lithuanian citizenship. This was accepted by 90 % of the non-Lithuanian residents. Those who accepted the citizenship also gained voting rights in elections.

emigrated from Vilnius (see Commercio, 2004; Tammaru & Kulu, 2003). As a result, the proportion of Lithuanian people in the city has grown significantly since 1989, rising by 12.7%, and currently consisting of 63.2% of the city population (Statistics Lithuania, 2012). The period since independence has also brought changes in the region surrounding the city. The Polish population, which dominated here since the 20th century, has started to shrink (by 14,500 in 2001-2011) and its relative share declined by 3.2% throughout the surrounding Vilnius region. The ethnic landscape of 2001 and recent changes in this landscape are illustrated in Figure 4.1, which shows information from the 2001 and 2011 censuses (Statistics Lithuania, 2003, 2013). The map on the left shows the ethnic segregation in the Vilnius region, with Lithuanians who dominate the city and Polish residents who dominate the surrounding region. The map on the right shows the decline in the proportion of Poles, especially in the suburban ring around the city of Vilnius. Although in general the population of Poles has decreased more than the population of ethnic Lithuanians, some areas to the outside of the Vilnius region have experienced a very small relative increase in the Polish population. Currently, ethnic minorities comprise approximately 56% of the population in the region surrounding Vilnius city, with the largest ethnic groups being Poles (43%), Russians (7%), and Byelorussians (3%). Meanwhile, ethnic minorities form 37% of the population in the city of Vilnius, with the same ethnic groups being the most numerous: Poles (16.5%), Russians (12%), and Byelorussians (3.5%).

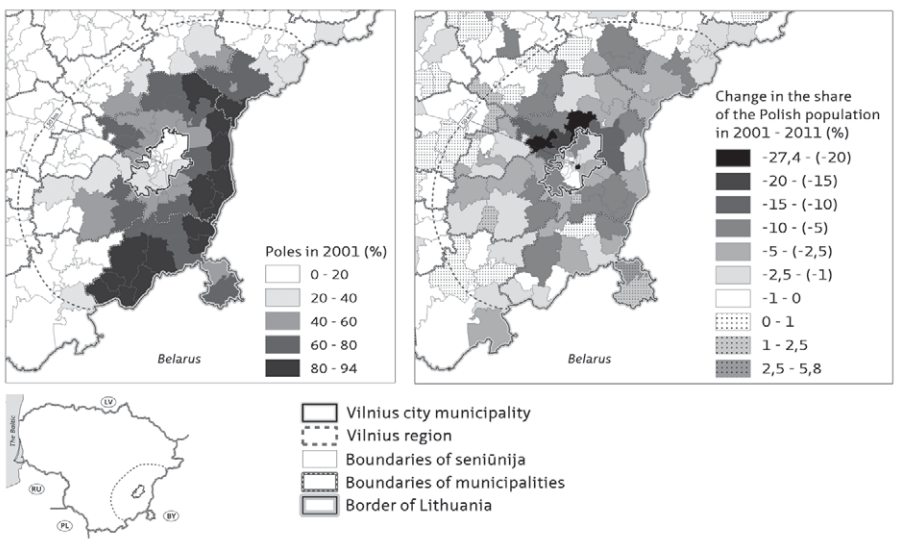

FIGURE 4.1 Ethnic landscape of the Vilnius region
Source: Data provided by Statistics Lithuania

Urban sprawl

Like in many other Central and Eastern European cities, during the Soviet times, the hinterland of Vilnius was devoted exclusively to agricultural and associated industrial production (see, e.g., Leetmaa & Tammaru, 2007; Sýkora & Ouředníček, 2007; Tammaru et al., 2009). The absence of a real estate market and the absence of private property contributed to the situation that, until the 1990s, suburbs did not exist (Bertaud & Renaud, 1997; Krišjāne & Bērziņš, 2009; Sýkora & Čermák, 1998). Compact high-density residential housing estates at the edges of cities, and large industrial areas within their limits, were among the most important features of urban development in the Soviet times, where spatial planning was carried out by the Communist Party (Vanagas, Krišjane, Noorkoiv, & Staniūnas, 2002). During the Soviet era, there was an active policy to reduce the dominance of large cities by the development of new regional centers and promoting decentralization of industry (Enyedi, 1996; Šešelgis, 1996). In Lithuania, this meant that part of the potential growth of Vilnius was distributed to other regions of Lithuania. Although the administrative territory of Vilnius city has gradually expanded, penetrating into the areas dominated by Poles, this process was slowed due to the restrictions of Soviet planning policy.

After the collapse of the Soviet Union, the introduction of a free market economy, and privatization liberated the previously constrained Vilnius growth potential and allowed the city to expand very quickly (Figure 4.2; Cirtautas, 2013; Ubarevičienė et al., 2011). This led to uncontrolled urban sprawl of vast low density single-family residential areas into the rural region surrounding Vilnius, an area dominated by Polish identity residents (compare Figures 4.1 and 4.2). The administrative territory of Vilnius city municipality has grown by 30% between 1990 and 2001, and since the restoration of Lithuanian independence in 1990, the population in the suburban zone has increased by approximately 30,000 (+20%), while in the city population has decreased by 40,000 (-7%)[25]. As a result of these changes, a functionally and spatially integrated urban system developed in the region (Harrison, 2010; Sýkora & Ouředníček, 2007). It is worth mentioning that the city of Vilnius, which is regarded to be the economic motor of Lithuania, is expanding into one of the economically least developed areas. The suburban zone is now a site of increasing interaction between the original residents, many of whom have a Polish identity, and newcomers who are mainly of Lithuanian origin.

25 Population decline is the prevailing trend in Lithuania. The country lost 17.2% of its population between 1989 and 2011. The population dropped in most areas, including the main cities and increased only in the regions surrounding these cities, including the suburbanization zone around the city of Vilnius.

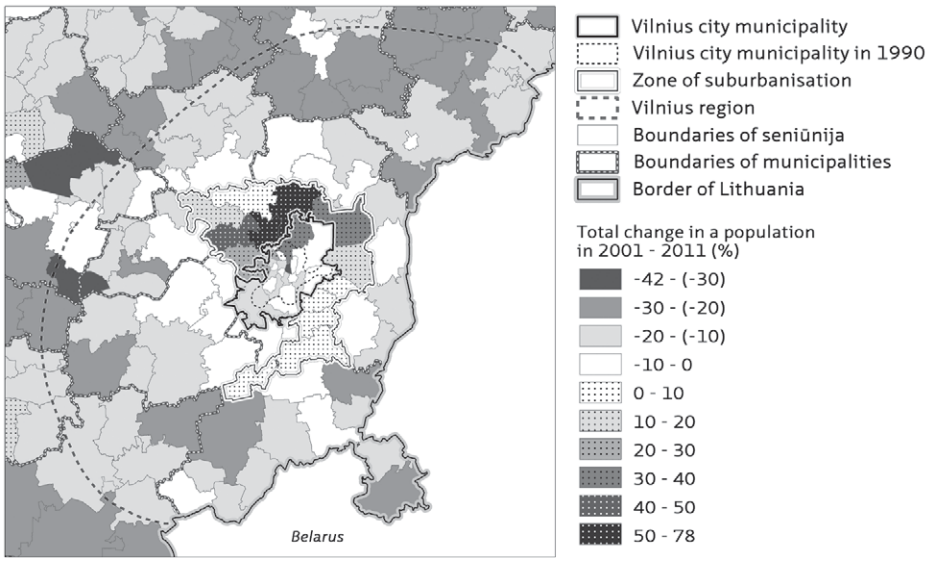

FIGURE 4.2 Urban sprawl of Vilnius
Source: Data provided by Statistics Lithuania

§ 4.4 Mobilization of the Polish vote and the potential for conflict

The Polish political party, Electoral Action of Poles in Lithuania (EAPL), has a significant impact on Polish minority identity building. The party was established in 1994, and had the aim of unifying the Polish identity residents in the Vilnius region, and to defend their interests. Since then the electorate of the EAPL has grown steadily. The campaigns of the party emphasize issues of particular interest to ethnic minorities, and especially to Polish identity residents, but the party also serves as a party of regional defense (Andžejevski, 2014). Some argue in the media that the problems raised by the EAPL are exaggerated and their promotion is only needed in order to mobilize its voters and to maintain the political influence of the party in the Vilnius region (Delfi. lt, 2014). Petrulis (2009) even went so far as to argue that the Vilnius region has now become an independent social-political entity in Lithuania. More than 70% of votes in the municipal elections went to the EAPL in the region surrounding Vilnius city. In some areas, populated mainly by the Polish identity residents, EAPL gained up to 95% of votes in the municipal elections and up to 80% in the national elections during the recent decade (Central Electoral Commission, 2012). Since its foundation, the EAPL had a majority position in the councils of municipalities in the region surrounding

Vilnius city. There is little political competition in the region as there is little to gain for other political parties due to the large Polish presence in the region. In Vilnius city, where the share of ethnic minorities is much smaller, the position of the EAPL is less strong and a broader spectrum of parties is elected. However, it should be noted that support for the EAPL is growing in Vilnius city as well, which is most likely the result of a mobilization of the Polish vote.

Because of the process of suburbanization, the share of Lithuanians is increasing in the region surrounding the city of Vilnius, and this might lead to a shift in the balance of political power in the suburban ring of the city. It can be expected that both Polish identity residents and Lithuanians feel the urge to be represented politically. Mobilizing voters can be expected to be especially important for the EAPL, because this political party holds a majority in the region and needs to defend its local political dominance. On the other hand, there is no direct single threat for the EAPL as ethnic Lithuanians vote for a broad set of other political parties without having a clear favorite. Moreover, those who recently suburbanized to the region may be less likely to vote as these new suburban residents often have stronger social relations with the city of Vilnius and are less concerned about the local politics of the suburbs.

Although people in the Vilnius region are used to living in a multicultural region, and people of the different ethnic groups are comfortable living side by side without any serious conflicts, the recent process of rapid urban sprawl, and thus increasing interactions between Poles and Lithuanians, may cause tensions. The suburban ring of Vilnius might therefore become a possible stage of social and ethnic tensions between Polish residents and the incoming Lithuanians. In 2010, we conducted fieldwork in the rural areas surrounding the city and visited offices of the local governments and interviewed their staff. We found that there are tensions between the original population (the majority of whom are Poles) and the incoming population (the majority of whom are Lithuanians), but none of the respondents emphasized that ethnicity was at the roots of these tensions. The issues mentioned that caused tensions were related to the different needs, different priorities, and a gap in quality of life standards between the old residents of the region and the newcomers. Often tensions originated from newcomers demanding better transport infrastructure, improvements in water-supply systems, or waste collection, whereas the original residents were against most changes with an impact on their immediate environment. The interviews suggested that differences in economic situation were more relevant than ethnic differences.

Ethnicity may, however, be an important underlying factor in determining a range of social tensions in the region, which may be reflected in voting behavior. The national media suggests that there are tensions related to the ethnic dimension in the Polish dominance of the region. Although the subject of these tensions is not directly linked

to the process of suburbanization and concerns the Polish minority as a whole, it is likely that the suburbanization process is part of the stimulus. One of the hot topics is the educational system (15min.lt, 2012; Alkas.lt, 2012; Audenienė, 2013; Media, 2013; Miškinytė, 2011; Respublika, 2011). The provision of education in Lithuania is the responsibility of local municipalities. This means that in municipalities where Polish identity people have a majority in local government, they can keep Polish schools open, even when the Polish population is shrinking and the number of Polish pupils decreases even faster. There is a national policy to reduce the number of schools with few pupils, but in the areas dominated by Polish identity residents these schools are kept open. At the same time there is no increase in the number of Lithuanian-language schools in areas of intense suburbanization and increasing numbers of Lithuanian pupils (Statistics Lithuania, 2013). Any interference of the national government in this matter is labeled as discrimination of ethnic minorities. Moreover, the media regularly reports on other issues of importance to the EAPL and its supporters. For example, over the past several years the EAPL has asked the Lithuanian government for permission to use the Polish alphabet for writing names in passports of Polish identity residents and to put up bilingual street and village names in municipalities where Poles dominate (15min.lt, 2013; Press Europe, 2009; The Economist, 2012; The Lithuania Tribune, 2013). Such actions by the EAPL are not only in the interest of their supporters, but also in the interest of the party as they work as an effective tool to mobilize voters who help to keep the dominant positions of the party.

§ 4.5 Hypotheses

We expect that the suburbanization process and voter migration might have consequences for electoral results in the region surrounding the city of Vilnius. First, we expect to find a negative relationship between population change and the share of votes for the Polish party (Hypothesis 1). We expect that in those areas where there is an increase in population (suburban zone), there will be a decrease in a share of votes for the Polish party. We also expect that the inflow of ethnic Lithuanians in the region surrounding the city of Vilnius will lead to a mobilization of the vote of the original Polish population. Based on our literature study, we expect that the Polish identity voters in the suburban ring will more often vote for the Polish party and will show an increase in voting turnout in order to strengthen their political influence in a time when others enter the region. However, because we use aggregate level data, and not individual level data, we cannot directly test hypotheses on the individual level. We therefore formulated a hypothesis on the aggregate level of voting districts.

We expect to find that there is an increased ratio between the Polish population and the absolute number of votes for the EAPL in the Vilnius region, especially in the zone of suburbanization (Hypothesis 2). As supporting evidence of the changing voting behavior, we expect the absolute number of votes for the EAPL to go up, and we expect that there is an increase in voting turnout in the region. In the conclusion of the article we discuss how our aggregate level results might be explained by underlying mechanisms at the individual level.

§ 4.6 Data and methods

To test our hypotheses, we used the voting results of the 1997 and 2011 municipality elections. We analyzed municipal elections instead of the national elections, because they represent the residents' concern of having their representatives in local governments. Since we are interested in the electoral behavior of ethnic minorities, we only analyzed votes on the Polish political party (EAPL) and voter turnout. Our study uses aggregated data for voting districts, which is the lowest spatial level available in Lithuania for elections' results. Electoral data are not available on the individual level, and therefore cannot be combined with individual characteristics (e.g., ethnicity, household structure, etc.). Since the aim of this study is to explore the relationship between suburbanization and the changing electoral behavior of the Polish minorities, we needed detailed data on the ethnic composition of the population on a low spatial level, which is not available for voting districts. We therefore had to aggregate voting data on the level of *seniūnija*, which are somewhat larger than voting districts (193 voting districts formed 68 *seniūnija*). Because the two different territorial levels do not coincide completely, some bias might result from the aggregation process.

According to the Lithuanian law, each of the voting districts cannot contain more than 5000 voters and officially there are no marked boundaries of these units[26]. Moreover, the number of voting districts, as well as their size, has changed over the research period, which makes comparison over time a challenge. We have mapped the limits of voting districts to get a clear representation of their territorial dimensions. These boundaries were approximated and homogenized into a unified grid, which was used to compare data of election results in different years. We took the most recent

26 Each district serves its own addresses, streets, individual neighborhoods, houses or villages.

voting districts as a basis and mapped the voting results of previous years onto this grid. We used cartographical tools to present the spatial pattern of voting results and the changes over time. The combination of cartographical methods and statistical techniques gives good insight into voting patterns.

Since the process of urban sprawl is central to this study, in the empirical part of the paper we are limiting our exploration of voting data to the region, which is under the direct influence of Vilnius city. This research area, including the city of Vilnius, covers about 8000 km^2 with approximately 750,000 inhabitants in total and 316 voting districts. The region surrounding the city of Vilnius covers 7600 km^2 with 220,000 inhabitants in total and 193 voting districts. In this region, a voting district contains approximately 1000 voters and covers 44 km^2. In the empirical part of the paper we will analyze data for the region surrounding Vilnius city, which is split into the zone of suburbanization and Vilnius region beyond the suburban zone.

§ 4.7 Results

Ethnicity and voting behavior

There have not been any detailed studies in Lithuania investigating the relationship between ethnicity and political preferences expressed through voting behavior. Postelection opinion surveys conducted in Lithuania in the period 2006-2009 showed that mainly Poles, and to some extent other ethnic minorities, vote for the EAPL (Lithuanian HSM data archive, 2010). In addition, the very large and significant correlation between the share of Polish identity residents and the share of votes for the EAPL in municipal elections suggests that a decisive factor in determining voting preferences for a large proportion of the population is their Polish identity (1997, $r = .923$, $n = 89$, $p < .0005$ and 2011, $r = .928$, $n = 89$, $p < .0005$). Based on these results, we argue that it is reasonable to assume that it is mainly Polish identity people who vote for the EAPL, even though individual level data is not available.

The scatterplots in Figure 4.3 show that the higher the share of the Polish population in an area, the higher the share of votes received by the Polish party. The *R*-square coefficients show that each model explains approximately 86% of the variance in the data.

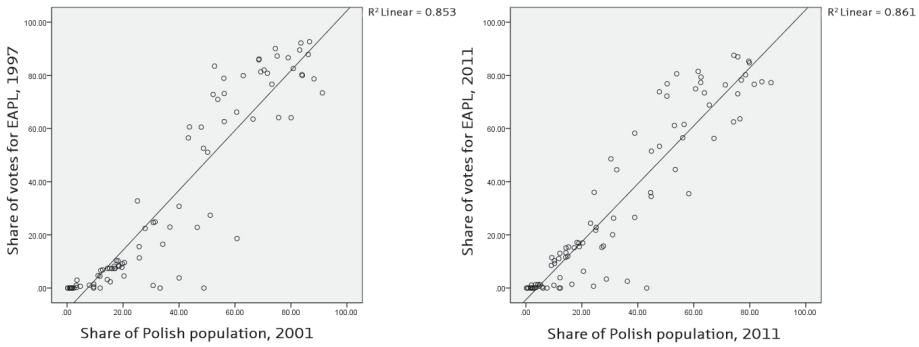

FIGURE 4.3 Share of the Polish population and share of votes for the EAPL on the level of *seniūnija*
Source: Data provided by Statistics Lithuania and the Central Electoral Commission of the Republic of Lithuania

Figure 4.4 shows the differences in voting results between Vilnius city and the surrounding region in both the 1997 and 2011 municipal elections. The region surrounding the city is characterized by large support for the Polish political party, with the EAPL yielding as much as 95% of the votes in a large number of voting districts. The city of Vilnius itself is characterized by much lower levels of votes for the EAPL with less than 15% of the votes going to this party for most of the city.

Although we have argued above that the party's popularity was steadily growing since 1994, the relative support for the EAPL decreased in many areas of the Vilnius region. Figure 4.5 shows the spatial changes in the proportion of voters supporting the EAPL between 1997 and 2011. The map shows an overall picture of decline in the relative support for the EAPL, except on the edges of the Vilnius urban region and in some parts of the city of Vilnius itself. These changes can be caused by changes in the population composition of areas, or by changing voting behavior of residents. It can be seen that almost the whole zone of suburbanization shows a decline in the relative support for the EAPL.

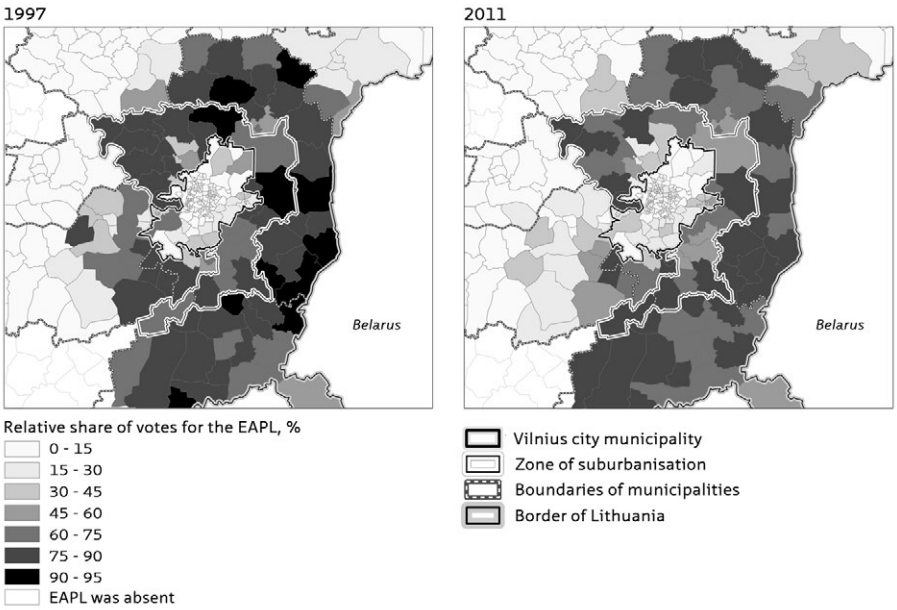

FIGURE 4.4 Relative share of votes for the EAPL in voting districts in the 1997 and 2011 municipality elections
Source: Data provided by the Central Electoral Commission of the Republic of Lithuania

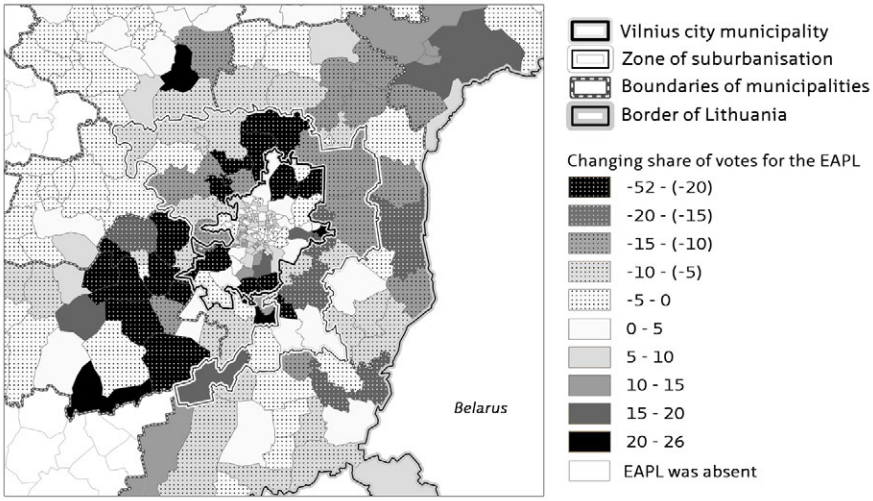

FIGURE 4.5 Changing share of votes for the EAPL in voting districts in the 1997 and 2011 municipality elections
Source: Data provided by the Central Electoral Commission of the Republic of Lithuania

In order to better understand the observations from the maps, we looked at the correlations between the relative change in the population and relative change in the votes for the Polish political party over the period of 1997-2011. We wanted to get more insight in the relationship between population change and voting behavior. We found that the correlation between population change and relative change in the votes for the EAPL was negative in both the suburban zone (r = -.595, n = 17, p = .012) and in the rest of the region (excluding the zone of suburbanization and the city of Vilnius) (r = -.330, n = 55, p = .014). Although the correlation was significant in both zones, it was considerably stronger in the suburban zone, which means that the most significant changes in local electoral behavior can be observed in those regions where intense suburbanization took place. These findings confirmed our first hypothesis.

The negative correlation in the suburban zone might be explained by the increasing share of ethnic Lithuanians (see Figure 4.1). Meanwhile, the negative correlation in the wider region is likely to be associated with spatial variations in terms of voting results in combination with negative population change and a changing ethnic composition. An increase in the relative support for the EAPL in some voting districts to the outside edge of the Vilnius region is likely to be an artifact of small numbers of votes for the EAPL in 1997 and 2011, so even small changes in the number of votes can cause changes in the percentages. Although we expected that the share of votes for the EAPL would decrease less considerably in the areas outside the suburban zone, the opposite can be observed in some voting districts. Apparently, the voting results depend on the EAPL's ability to motivate its voters both nationwide and on the local scale. Therefore, it might differently affect the voting behavior in different locations. The effect of suburbanization may also differ in different local political contexts.

The decrease in the relative support for the Polish party in the zone of suburbanization is most likely related to the flow of population from the central city to the surrounding Vilnius region. Newcomers in the suburban zone, most of whom are ethnic Lithuanians, have different political preferences than the original population. The increase of Lithuanians in the region dominated by Polish identity residents redistributed the rankings of the competing political parties. Migration flows can have major effects on electoral change even in places without large groups of ethnic minorities (see Robinson & Noriega 2010 on the theory of voter migration; and see Halla et al., 2012 on causal effects of immigration on election outcomes).

The maps show that there is an increase in the relative support for the EAPL in some zones which are not affected by urban sprawl, namely, the central and most peripheral parts of the region. The increase of the share of votes for the EAPL in the city of Vilnius could be explained by the outflow of voters for other parties, but there are no data confirming this hypothesis. It is also possible that the Polish population in the city

became more politically active. However, one of the important factors for this increase of support for the EAPL in the city was that just before the 2011 elections, the EAPL formed an electoral coalition with the Russian ethnic party, Russian Alliance (RA), in the municipalities of the Vilnius region. Within this coalition[27] the EAPL was a dominant force. Although the RA has never been popular in the region surrounding Vilnius, and did not participate in recent municipal elections in the region (except in one unsuccessful case in one of the municipalities), it had a more significant role in Vilnius city (the RA received 4.4% of votes in the 2007 Vilnius city municipal elections). The collaboration between the EAPL and the RA enabled the EAPL to strengthen its position in the central city, although support for the coalition with RA remained relatively low in the city compared with support in the rest of the region. The substantial increase of the share of votes for the EAPL in the more remote parts of the larger region cannot be explained only by the formation of the coalition, because of the small proportion of the Russian population in these areas. This increase is most likely the result of the enhanced voter's mobilization efforts of the EAPL in the region. Contrary to the suburban zone, these efforts were more influential in the peripheral part of the region, where Polish residents comprise the majority of the population, and where the changes in population (its number and ethnicity) are negligible. It must be noted that despite the general trend of decreasing share of votes for the Polish political party, it still receives more than 50% of the votes in most of the voting districts in the region surrounding the city of Vilnius, especially in its periphery.

Increasing absolute number of votes for the EAPL

Although the relative share of votes for the EAPL has dropped by 4.1% between 1997 and 2011 in the surrounding Vilnius region (see Figure 4.5), Figure 4.6 shows that the absolute number of votes for this party actually increased by 12,000 (33.5%) during the same time. In the zone of suburbanization there was an increase of 7500 (55%) votes for the EAPL, and a 4% decrease in share of votes for this party. These results are striking as the Polish population decreased in absolute numbers during the same period.

Because we use aggregate data, we cannot draw conclusions on individual level voting behavior. However, postelection opinion surveys (Lithuanian HSM data archive, 2010) show that it is mainly Polish identity people who vote for the EAPL, which therefore suggests that Polish voters became more active in the Vilnius region, especially in the

27 We will use the term EAPL in the remaining parts of the paper when talking about the coalition of the EAPL and RA in 2011.

suburban zone. Further support for this hypothesis are the correlations (see Table 4.1) between the absolute number of Poles and the absolute number of votes for the Polish party, which became stronger in the region as a whole in 2011 compared to the results of 1997. It should be noted that the increase in the correlation was substantial in the zone of suburbanization. The strongest correlation between the two variables was found in the region beyond the suburban zone, which suggests that Poles are most likely to vote for the Polish party in this area. However, the differences were very small throughout the region, especially in 201

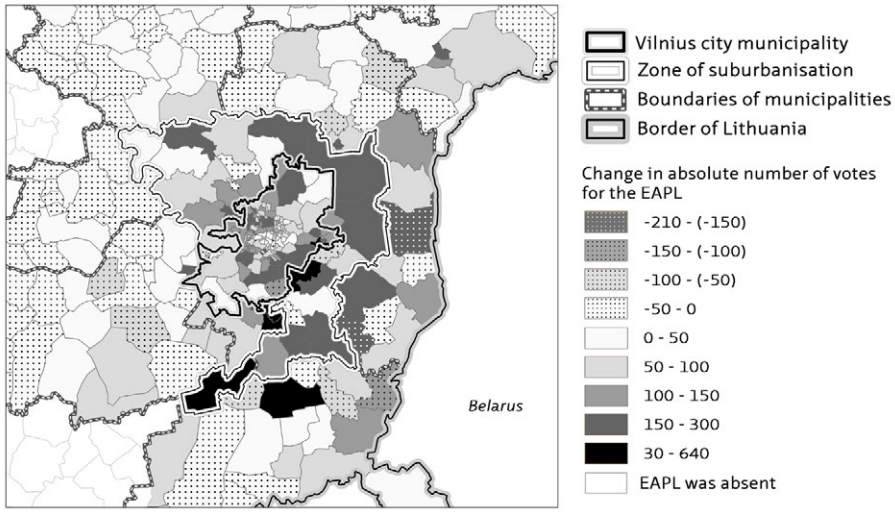

FIGURE 4.6 Change in the absolute number of votes for the EAPL in voting districts in the 1997 and 2011 municipality elections
Source: Data provided by the Central Electoral Commission of the Republic of Lithuania

	1997	2011
Whole region surrounding Vilnius city	r = .896 n = 68 p < .0005	r = .930 n = 68 p < .0005
Zone of suburbanization	r = .432 n = 17 p = .083	r = .913 n = 17 p < .0005
Vilnius region beyond suburban zone	r = .903 n = 55 p < .0005	r = .935 n = 55 p < .0005

TABLE 4.1 The correlations between the absolute number of Poles and absolute number of votes for the Polish party in the 1997 and 2011 municipal elections on the level of *seniūnija*
Source: Data provided by Statistics Lithuania and the Central Electoral Commission of the Republic of Lithuania

To get more insight into our data we also calculated the potential[28] ratios of voting turnout amongst different population groups and for different areas (Table 4.2). The ratios have been calculated for three groups: the whole population, the Polish population, and the non-Polish population. We used data on total voting turnout, the number of votes for the EAPL, and the number of votes for other parties. We included the whole population in our calculations, not only those with voting rights, and as a result, the percentages of voting turnout are relatively low. According to the Central Electoral Commission the general turnout level in 2011 elections was higher than that in 1997 in the whole country (35.6% in 1997 and 44.1% in 2011). Table 4.2 suggests that the voting turnout increased among all groups and in all specified areas, but that the increase was higher in the Vilnius region compared to Lithuania as a whole. What is of special interest here is that Poles stood out by the highest increase in potential voting turnout in the zone of suburbanization. This increase was equal to 17.9% while the increase among the whole population was 11.8% in this zone, compared to the general increase of 9% in the country. This finding confirmed our second hypothesis.

	1997			2011		
	Whole pop. / voter activity (%)	Polish pop. / votes for EAPL (%)	Non-Polish pop. / votes for other parties (%)	Whole pop. / voter activity (%)	Polish pop. / votes for EAPL (%)	Non-Polish pop. / votes for other parties (%)
Lithuania	29.1	22.2	29.6	38.1	37.2	38.1
Whole region surrounding Vilnius city	31.2	33.2	29.7	44.9	46.7	43.8
Zone of sub-urbanization	27.4	28.9	26.7	39.2	46.8	36.9
Vilnius region beyond sub-urban zone	31.6	30.7	32.1	46.5	43.4	48.5

TABLE 4.2 The ratios of voting turnout amongst different population groups in the 1997 and 2011 municipality elections on the level of *seniūnija*

Source: Data provided by Statistics Lithuania and the Central Electoral Commission of the Republic of Lithuania

28 Polish people do not necessarily vote for the Polish party, but as shown above, the significant and very strong correlation between the share of the Polish population and share of the votes for the EAPL, and postelection opinion surveys, suggest that a decisive factor in determining voting preferences of a large proportion of the population is their Polish identity and the mobilization of votes.

Comparing the 2001 and 2011 Censuses (Statistics Lithuania, 2003, 2013) shows that the total population in the zone of suburbanization has risen by approximately 37,000. These are mainly newcomers of Lithuanian origin, who are likely to have different political preferences than the original (Polish) population in the region. We hypothesize that our aggregate level findings implicate that on the individual level the inflow of Lithuanians has led to an increased participation of Poles in the elections and increased numbers of votes for the Polish party.

Spatial variation in voting turnout

The region surrounding Vilnius stands out for its exceptionally high voting turnout in the municipal elections and for a relatively low turnout in the central government elections since the restoration of Lithuanian independence (Central Electoral Commission, 2012). In 2011, in many of the voting districts, voter turnout exceeded 60%, while both in Vilnius city and the rest of Lithuania the average turnout in the municipal elections was only 44%. This is the opposite of what can be observed in the rest of Lithuania, where voting turnout in the elections of central government – Parliamentary as well as Presidential - is highest. These differences suggest that among the residents in the region surrounding the city of Vilnius the regional (Polish) identity is stronger than the national Lithuanian identity (see also Chernyha & Burg, 2012). Furthermore, the mass media in Lithuania as well as the EAPL itself often depicts the Polish population as Poles in Lithuania, not Lithuanian Poles (it is even stated in the name of the party).

Voting turnout in the 1997 and 2011 municipal elections in the city of Vilnius and the surrounding region is shown in Figures 4.7 and 4.8. It can be seen that voting turnout is the lowest in the city and the highest in the region surrounding it. As mentioned above, there was a general increase in voting turnout in the whole of Lithuania between 1997 and 2011, but it was higher in the Vilnius region. The maps show that the most 'active' areas in 2011 correspond with the areas of the highest proportion of Polish residents (compare Figures 4.7 and 4.1). This is also confirmed by the positive correlation between the share of the Polish population and voting turnout (Table 4.3). These aggregate level results suggest that the Polish identity voters in the suburban ring show an increase in voting turnout and this is what we expected to find. However, more research on the individual level is needed to confirm this.

Although the correlation was stronger in the zone of suburbanization in the elections of 1997, it became of equal strength across the surrounding city region in the elections of 2011. The reduced correlation in the suburban zone might be explained by the changes in ethnic composition. Newcomers of Lithuanian origin may have a weaker regional identity and therefore little motivation to participate in the local elections. Thus, even with

the increasing numbers of votes for the EAPL (and increasing voter turnout of the Polish voters), the general voter turnout decreases in the zone of suburbanization.

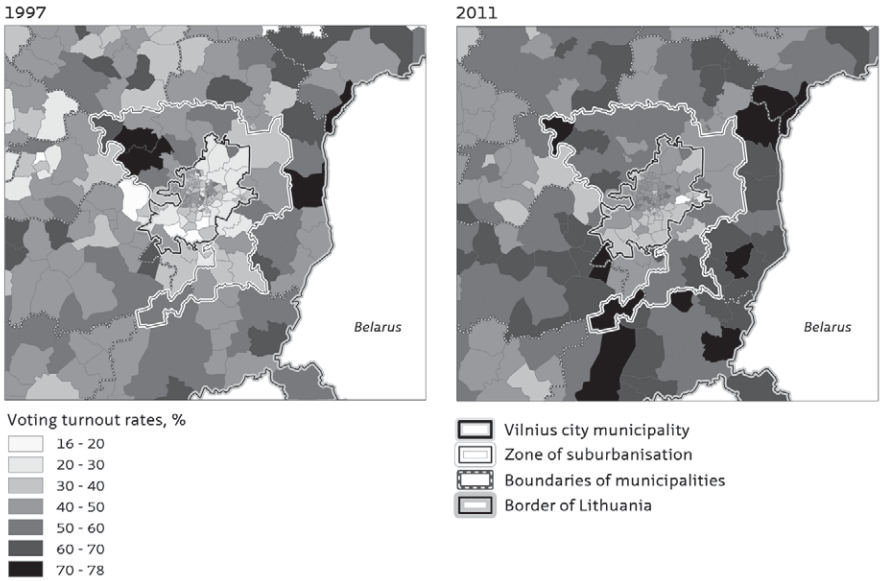

FIGURE 4.7 Voting turnout rates in voting districts in the 1997 and 2011 municipality elections
Source: Data provided by the Central Electoral Commission of the Republic of Lithuania

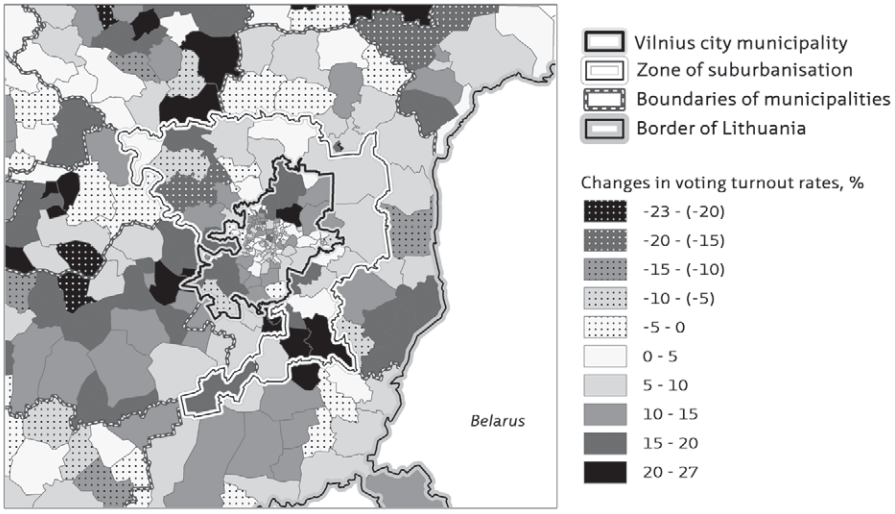

FIGURE 4.8 Changes in voting turnout rates in voting districts in the 1997 and 2011 municipality elections
Source: Data provided by the Central Electoral Commission of the Republic of Lithuania

	1997	2011
Whole region surrounding Vilnius city	r = .438 n = 68 p < .0005	r = .535 n = 68 p < .0005
Zone of suburbanization	r = .609 n = 17 p = .009	r = .575 n = 17 p = .016
Vilnius region beyond suburban zone	r = .459 n = 55 p < .0005	r = .576 n = 55 p < .0005

TABLE 4.3 The correlations between the share of the Polish population and voter turnout in 1997 and 2011 in municipality elections on the level of *seniūnija*
Source: Data provided by Statistics Lithuania and the Central Electoral Commission of the Republic of Lithuania

§ 4.8 Conclusions and Discussion

The process of rapid urban sprawl, which started right after the restoration of Lithuanian independence, became a main driver of changes in the ethnic composition in the surrounding Vilnius region. This was caused by the inflow of ethnic Lithuanians from the city of Vilnius into its surrounding areas, which are dominated by Polish identity residents. Our main hypothesis was that the inflow of ethnic Lithuanians in the region surrounding the city of Vilnius will lead to a mobilization of the Polish vote of the original population and that this is reflected in their voting behavior.

Our results showed that there are clear spatial patterns in voting behavior in the Vilnius region. The region surrounding the city is dominated by those who vote for the Polish party (EAPL), while the support for this party is much lower in the city. Analysis of the changes in the share of votes for the EAPL between 1997 and 2011 shows a decrease in the share of votes in the surrounding city region, especially in the suburbanization ring around Vilnius. At the same time we observed a stark increase in the absolute number of votes for the EAPL in the zone of suburbanization, and we found an increase in voter turnout in the region, especially in the parts with the higher proportion of Polish population. These aggregate level findings suggest that the Polish population has a stronger local identity than the suburbanizing Lithuanian population, and that Poles are concerned about their representation in municipal government.

For our analysis we only had access to aggregate level data and not individual level data. The latter is needed to be able to say anything conclusive on the mechanisms at play at the individual level. However, since the results of postelection opinion surveys (Lithuanian HSM data archive, 2010) show that it is mainly Polish identity people who vote for the EAPL, we suggest the following tentative conclusions. The dropping share of votes for the EAPL in the suburbanization ring is most likely the result of the voter migration effect: Lithuanians from the city move to the suburban ring and vote for different parties than the original population in the region. At the same time we see an increase in the absolute number of votes for the EAPL in the suburban ring and increased voter turnout. From this we tentatively conclude that the Polish identity residents of the region show increased voter turnout in an attempt to protect their weakening position in local politics. Although the Polish party still receives more than 50% of the votes in the majority of the voting districts, the continuing process of suburbanization poses a threat that the EAPL will lose its dominant positions in the future.

We expect that those places which show increased voting turnout, but dropping shares of votes for the EAPL, are places of potential tensions between ethnic groups. Those are the places where the differences in needs, priorities, worldviews, etc., are the greatest between two very different ethnic groups. Increasing media attention with regard to these tensions shows that the educational system is now among the main disputes in the region. The tensions mostly occur because the national government wants to transform the network of small Polish-language schools. According to the national policy, small schools need to be closed in order to increase the effectiveness of the educational system. However, in the Vilnius region this policy is opposed by the Polish minority who regard the policy as discrimination. Since municipalities are responsible for the implementation of the national education policy in Lithuania, the situation in the Vilnius region is quite tense.

Notwithstanding the fact that electoral data are not perfect, and does not represent all aspects of political preferences of residents, the data proved to be useful in identifying areas of potential future ethno-political tensions. Using electoral data has also shown to be a useful tool to investigate the spatial patterns of suburbanization as well as the processes of the formation of ethnic and regional identities. The main weakness of the data we used is that it is aggregate level data and not individual level data. The consequence of this is that we can only speculate on the individual level mechanisms behind what we found on the aggregate level. A detailed survey linking ethnicity, voter behavior, and value orientations could supplement the results of our study and would contribute to a better understanding of the local ethnic and political context. This should be the subject for the future research in order to better assess the ethno-political situation in the Vilnius region.

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5 Large social inequalities and low levels of socio-economic segregation in Vilnius

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Abstract: The city of Vilnius has experienced major shifts in occupational structure between 2001 and 2011 and at the same time there were major transitions in the housing market and suburbanization. The main aim of this chapter is to get more insight in recent socio-economic segregation processes in Vilnius. We used occupational groups as a proxy for socio-economic status, and census tract level data to measure segregation in Vilnius and its three main housing zones during 2001 and 2011. Notwithstanding the major economic and social changes of post-communist society, we found low levels of segregation and modest change during the last decade. Local patterns of segregation were explored using location quotient maps. The analyses illustrated a deepening social divide in the city between the relatively rich north and the poorer south of the city, but the inner city changes are somehow ambiguous. In this chapter we argue that the main factors of socio-spatial change in Vilnius are related to an exceptionally high share of housing estates in the city and the polycentric urban system of the country. Together with 'fast-track' reforms after 1990 this urban system gave a unique character to the current processes and patterns of segregation.

§ 5.1 Introduction

Vilnius, the capital of Lithuania (536.000 inhabitants in 2011), was greatly reshaped by processes of massive industrialisation and urbanisation during the communist period (Vanagas, Krišjane, Noorkoiv, & Staniūnas, 2002). The post-1990 period was also characterised by massive urban transitions triggered by reforms to a market-led neo-liberal economy (Aidukaite, 2014; Brade, Herfert, & Wiest, 2009). These recent

transitions resulted in an annihilation of public housing policies and fast urban sprawl, stimulated by loosely regulated suburbanization. At the same time, fundamental changes took place in the Lithuanian society and economy, resulting in a changing occupational structure and an increase in social inequalities. It is likely that these inequalities also have a spatial dimension, but up to date there has been no systematic research into the changing socio-spatial patterns of post-communist Vilnius.

The city of Vilnius, compared to other capital cities of Central and Eastern European (CEE) countries, has some unique characteristics that are shaped by its mutually dependant historical pathway and geographical situation. The capital city is located in the eastern part of Lithuania, just 30 km from the Belarus border. The deep valleys of the Neris and Vilnelė rivers, which penetrate the city, create a fragmented urban structure and land-use pattern. Due to the Holocaust and post- World War II repatriation of the Polish population of Vilnius, which previously constituted the majority of the residents in the city, Vilnius hardly has an inherited social structure from the pre-war period (Czerniakiewicz & Czerniakiewicz, 2007; Eberhardt, 2011; Mendelsohn, 1983; Weeks, 2008). Combined with the Soviet period of industrialisation and associated migration flows, this created a unique ethnic landscape of the Vilnius urban area: the city is dominated by migrants and their descendants from within Lithuania as well as from the other former republics of the Soviet Union (USSR), while the Polish population dominates in the poor region surrounding the city (Ubarevičienė, Burneika, & van Ham, 2015). Another unique feature of Vilnius is its position in the settlement system of Lithuania. As a consequence of Soviet time planning, the Lithuanian urban network was centralized to a much lesser degree than was the case in the other two Baltic countries of Estonia and Latvia. Since 1990s this has resulted in the larger flows of inner migration directed towards the capital city and thus play an important role in the socio-spatial transformation of the country.

The main aim of this chapter is to get more insight into recent socio-economic segregation processes in the Vilnius city municipality (later, simply Vilnius or the city). Although we would have liked to focus on the surrounding region as well, data limitations forced us to concentrate on the city itself. Nevertheless, the processes that are taking place in the wider urban region will also be discussed because of their increasing importance. The chapter addresses the following three research questions:

1 How did the occupational structure of the population of Vilnius city change between 2001 and 2011 censuses? Is there evidence of polarization or professionalization of the workforce?

2 Do we find evidence of increasing or decreasing levels of occupational segregation in the 2000s following the growth of social inequalities since the 1990s?

3 How do the segregation processes vary between the city zones (inner city, large housing estates, outer city)?

In the next sections of this chapter we will present the wider historical and geographical context of Vilnius and the developments of the labour and housing markets. The empirical investigation of changes in the social segregation of Vilnius is based on 2001 and 2011 censuses. We use ISCO occupational groups as proxy for socio-economic status. There is no data available on income at a low geographical level. We focus on comparing three major housing zones in the city: the inner city, large housing estates, and the outer ring of the city. These three housing zones partly correspond with three major cycles of the urban growth. We hypothesize that large housing estates of the Soviet period, designed to facilitate communist society, plays a noticeable role in preventing segregation processes in Vilnius.

§ 5.2 Literature review and background

Specific historical and geographical features

The history of Vilnius, and especially the frequent shifts of political borders in the twentieth century, has had a huge impact on the development of the urban structure of the city. Vilnius belonged to Russia, Germany, Lithuania, Poland, Lithuania, the Soviet Union, Germany, the Soviet Union and Lithuania during the last century. This means that the role of Vilnius in the hierarchy of the urban system was in constant flux. The inner city was built mainly before the beginning of the twentieth century when Vilnius was part of the Russian Empire, and this period corresponded with the first wave of industrialisation. The city centre, the first industrial districts, poor working-class neighbourhoods and rich nearby villa districts emerged and they form the backbone of the inner city of today's Vilnius. The construction of the railway from Sankt Petersburg to Warsaw at the end of the nineteenth century also had an effect on the existing urban

fabric. As a result, industrial areas and exclusively working-class neighbourhoods emerged mostly in the southern part, while more affluent residential neighbourhoods are located in the northern part of the city. This division is visible up to the present day.

During the interwar period, the growth of Vilnius was limited. The Vilnius region was subsumed under the Polish governance and thus disconnected from the rest of Lithuania. The construction of owner-occupied single-family dwellings was minimal during this period unlike what happened in the other two Baltic capitals of Tallinn and Riga. The construction of single-family houses was also constrained in the Soviet period as large housing estates became the dominant form of housing. As a result, now only 15% of the total living floor space in Vilnius is in buildings with one or two dwellings, and in 1990 in Vilnius the living space per capita was one of the smallest in the entire CEE (16 sq. m.).

Political shifts in the twentieth century also caused major and sudden changes in migration flows, the size of the urban population and its ethnic composition (Stanaitis & Česnavičius, 2010). The population of Vilnius decreased from 270,000 in 1941, and down to as low as 110,000 in 1944 as the city shifted from German to the Soviet powers. In this period the number of Jews decreased from 57,000 to 2,000 because of the Holocaust (Mendelsohn, 1983), and about 107,000 of the former Polish citizens who had constituted the majority of the city's population before World War II left Vilnius in 1945–1947 (Czerniakiewicz & Czerniakiewicz, 2007; Eberhardt, 2011).

The post-war mass industrialization accelerated the growth of Vilnius city and led to a rapid increase of its population. The city received many in-migrants from other parts of Lithuania but also from the USSR, mainly from Russia. However, the proportion of in-migrants from the Soviet Union was much less compared to Riga and Tallinn. The region surrounding Vilnius has experienced many fewer social transformations, a unique ethnic landscape, characterised by a large ethnic segregation between the city and its surroundings was created (Figure 5.1).

Lithuanians form the majority of the Vilnius population, while sizeable parts of the suburban ring are dominated by Poles. Ethnic segregation is marked in the city as well (Figure 5.1). Although this fragmentation is clearly visible at the lowest spatial level (census tracts), it is less expressed on the higher level of LAU 2 regions (city districts). In 2011 there were no LAU 2 regions (out of a total of 21 in the city; see Figure 5.3) where Lithuanians accounted for less than 50% of the population. It has to be mentioned that the northern part of the city has a larger portion of Lithuanians than the industrial southern part. While pre-empting the further outcomes of this research, we can state that the patterns of ethnic composition in Vilnius largely corresponds with the distribution of the highest and lowest social status groups, indicating that there is an ethnic dimension in the socio-economic segregation in Vilnius.

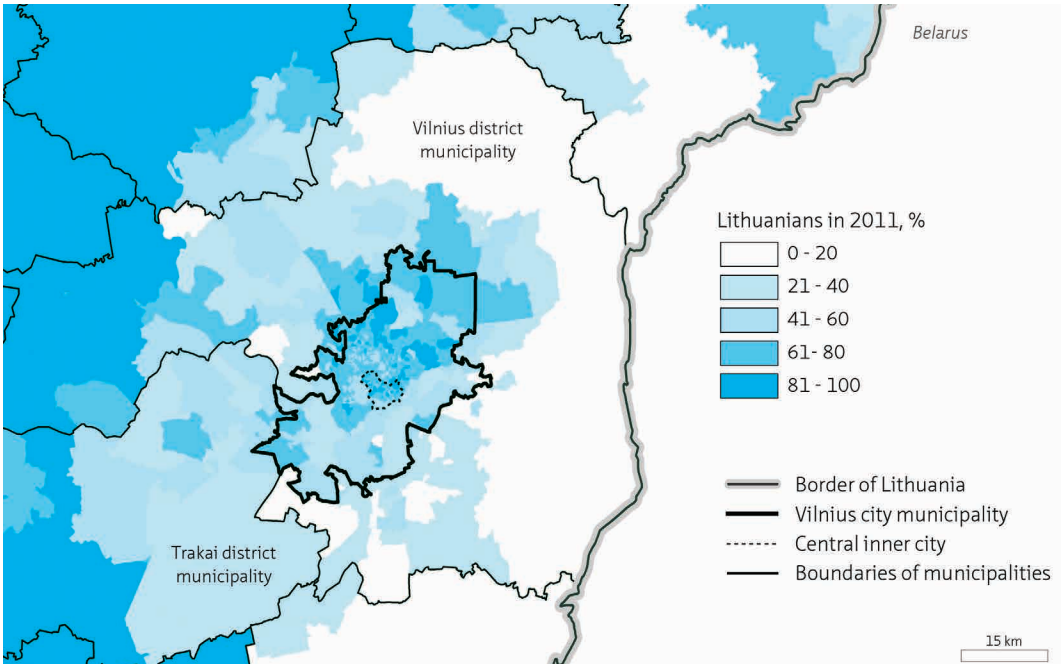

FIGURE 5.1 Ethnic fragmentation of the Vilnius urban region
Source: Census 2011, Statistics Lithuania, authors' map

Spatial planning and development in Lithuania during the Soviet period was dominated by policies directed at creating a 'unified settlement system', guided by the slogan 'erode the differences between city and country while building communism'. As a result of this policy, industry was spread throughout Lithuania during the Soviet period. The policy was based on the modified ideas of German geographer Christaller (Vanagas, 2003) and the aim was to create a society with no spatial differences in terms of social and economic structure across the whole country. A polycentric urban network without a clear dominance of a single metropolitan region was created in Lithuania. Contemporary Vilnius inhabits around 17% of the country's population, while Riga and Tallinn have approximately a third of their national populations. Since 1990, when Lithuania regained independence from the Soviet Union, the country has experienced a period of metropolisation, resulting in the relative growth of the Vilnius population, and a shrinkage of rural areas and medium-sized cities as a result of internal migration processes. We stress that this is the relative growth as, overall, Vilnius lost 7.6% of its population between 1996 and 2012, while other major cities lost more than 20% because of natural decrease and emigration (and Lithuanian average was minus 16%) (Statistics Lithuania, 2015). The suburban areas surrounding the largest cities were the only areas in the country that gained population (Ubarevičienė, van Ham, & Burneika, 2016). Although between 2001 and 2011 the

total population in the Vilnius metropolitan area was growing due to the urban sprawl, the central city was shrinking (Figure 5.2).

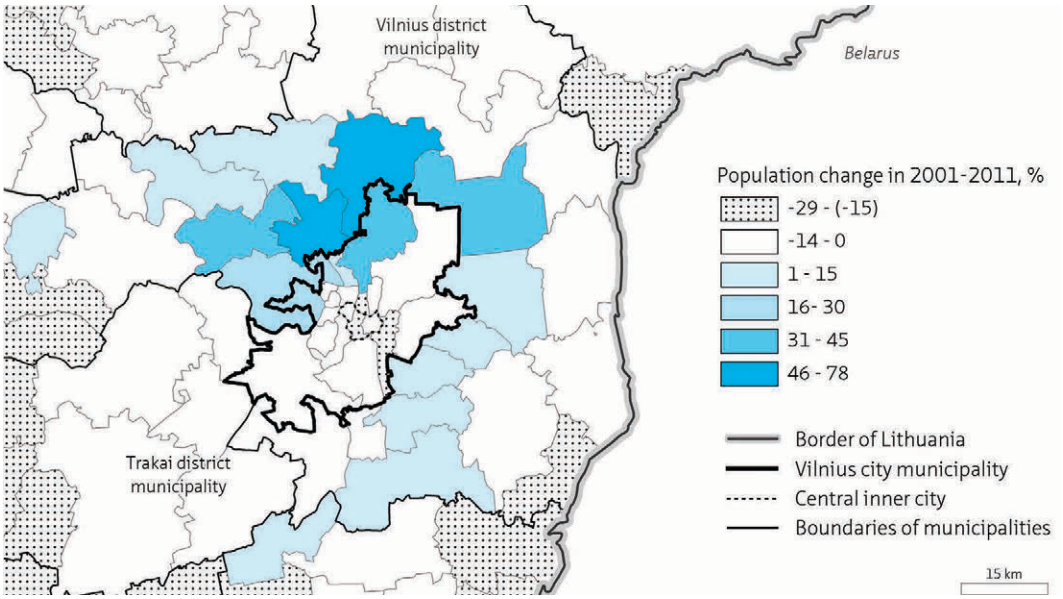

FIGURE 5.2 Population change in the Vilnius urban region, 2001-2011
Source: Census 2001, 2011, Statistics Lithuania, authors' map

The process of suburbanization around Vilnius is largely unregulated and has an irregular pattern. Until 2011 the most intense suburbanisation has been taking place next to the city's administrative border, but new suburban settlements could be found as far as 40 km from the city centre (Ubarevičienė, Burneika, & Kriaučiūnas, 2011). Albeit the suburban zone contains a small fraction of the total urban population, socio-economically it is an important, integral part of the Vilnius housing market and, hence, of segregation processes. Therefore, we will also discuss the processes that are taking place in the wider urban region.

Contemporary housing market in Vilnius

Residential mobility plays a dominant role in segregation processes and the housing market is an important factor influencing the location decisions of the population. More than 96% of all dwellings in Vilnius are privately owned (Statistics Lithuania, 2015). This

is a consequence of voucher privatisation in the early 1990s and an absence of active social housing policy. Only around 3% of non-privatized housing stock is social housing in Vilnius, and therefore it does not have much influence on the functioning of the regional housing market. Most of the social housing in Vilnius is located in the central part of the city and has low rents, housing the lowest-income households.

Limited land supply also has an impact on the housing market in Vilnius. Forests, where changes of land use are largely prohibited, cover more than 40% of the city's territory. New constructions are also strictly regulated in the Old Town, protected by the cultural heritage regulations. As a result, new residential construction is taking place in the former industrial sites and empty areas in the inner city, and there is weakly controlled and dispersed sprawl of privately owned housing far beyond the city limits.

Banks play a significant role in the housing market as they control mortgages. As Harvey (2009) argued, an ability to obtain bank credit often makes a greater impact on housing decisions than savings or salaries. In Vilnius, it is easier to obtain a loan for a newly constructed dwelling as it is possible to take out a loan up to 95% of the dwelling's price if a property is no more than ten years old. To take out a loan for an older apartment, no more than 75% can be borrowed. The loan policy and relatively high real estate prices encouraged middle-class and higher-income households to purchase apartments in new high-rise neighbourhoods developed in the former outer city zone areas instead of older apartments at similar prices in the more central locations. This resulted in the vast construction of densely built-up multi-storey apartment neighbourhoods at the edge of the city. At the same time, favourable conditions for this housing boom were created by the rapidly growing number of the higher-status groups in Vilnius, many of whom settled in the northern part of the city where the new developments were concentrated. It has to be noted that these processes are still relatively small in scale since only 6.7% of all households who owned their house had mortgages in 2011 (compared to 17% in Estonia and 18% in the Czech Republic) (Aidukaite, 2014).

A large inflow of internal migrants from other parts of Lithuania (more than 130,000 during 1994–2011) and a malfunctioning official housing rental market have been other major factors influencing the housing market in Vilnius. Data from the Lithuanian State Tax Inspectorate (2014) showed that 25–30% of employees in Vilnius (70–80,000) are not registered as the inhabitants of the city. The study of Tereškinas et al. (2013) found that almost a quarter of the population of the inner city live in rented housing, while only some 1,500 business certificates to rent housing are issued in Vilnius yearly. It is likely that some of these unregistered employees reside in the rented dwellings without a legal agreement and have a significant impact on the social segregation within the city.

Finally, heating cost compensation, an instrument of state social policy, has an impact on the functioning of the housing market and therefore segregation. According to the policy, households should not spend more than 20% of their income on heating costs. Otherwise for poor households, in older apartments built in the Soviet period, heating costs would exceed their income in winter time. As a result of this compensation, lower-income groups (for example pensioners) can afford to live in expensive districts and large apartments. The compensations for heating preserve an existing residential structure by reducing market pressure on low-income residents to exchange their current dwellings for smaller and cheaper ones. Therefore, changing segregation patterns in Vilnius are mainly caused by the mobility of more affluent population groups.

Socio-economic segregation in Lithuania

The combined effects of major political, economic and social transitions have resulted in a large-scale socio-spatial transformation in the CEE countries since the early 1990s (Brade et al., 2009; Marcińczak, 2012; Musil, 1993; Sýkora, 1999; Sýkora & Bouzarovski, 2012; Ubarevičienė et al., 2011). Research that directly addresses issues of housing and socio-economic segregation in Lithuania has only been carried out recently (Krupickaitė, 2014; Tereškinas, Žilys, & Indiliūnaitė, 2013; Žilys, 2013). The survey-based study of Krupickaitė (2014) showed that most of the suburban residents have a higher socio-economic status (in terms of income and education). Results also demonstrate that the inner city neighbourhoods are very dynamic: 50% of the respondents living in the inner city have moved there in the last ten years, confirming the ongoing gentrification process. The least mobile population are those living in the typical high-rise multifamily apartments of the Soviet era (Krupickaitė 2014). Tereškinas et al. (2013) and Žilys (2013) found, also based on survey data, that levels of segregation are low in Vilnius.

The study that is most related to this chapter was done by Marcińczak et al. (2015). It employed 2001 census data and compared segregation in the CEE capital cities, including Vilnius. Some interesting differences between Vilnius and other capitals of CEE countries were found in this study: Vilnius had the lowest share of the middle-status and the highest share of low socio-economic status groups. It was also identified as having the highest share of 'bipolar neighbourhoods', where high- and low-status occupational groups live together. Our research could be regarded as a continuation of this study, based on recently released 2011 census data.

§ 5.3 Data and methods

We base our quantitative analysis of socio-economic segregation processes in Vilnius on 2001 and 2011 census data at the level of census tracts. Both of the censuses were carried out during the post-crisis periods and therefore represent periods of modest economic growth. The Asian-Russian crisis (1998–1999) mostly affected the peripheral parts of the country, while the global economic crisis (2008–2010) had a stronger influence on the development of the main cities, especially Vilnius. The labour market was stagnant and emigration was high during both census periods.

Our study focuses on Vilnius city municipality within its administrative limits. Although data limitations do not allow us to analyse the wider urban region, the recent process of urban sprawl and some effects of suburbanization on the socio-economic segregation are illustrated using data at the level of local administrative units (LAU 2) (Figure 5.2). On the other hand, a significant part of the suburbanisation took place within the city limits, where the vast majority of the Vilnius region's population live.

We distinguished three major housing zones in Vilnius that differ in their housing stock, period of construction and location. Then we used census tract data to measure global indices of segregation in these three zones for both 2001 and 2011: indices of segregation, dissimilarity and isolation (see also the introduction of this book for more detail: Tammaru et al. 2016). We also created location quotient maps, illustrating differences in concentration of higher and lower occupational groups between the census tracts in Vilnius in 2001 and 2011. Our analysis is based on occupational data, where main ISCO groups are used as a proxy for socio-economic status. Although occupation does not necessarily reflect income, the national labour force survey of 2010 (Statistics Lithuania, 2015) showed that the differences in incomes between occupational groups are significant.

To make indices and spatial units comparable between the censuses we had to aggregate census organizational units (enumerator areas), which differed in 2001 and 2011. For this purpose we used AZTool software developed at the University of Southampton (Cockings, Harfoot, Martin, & Hornby, 2011; Martin, 2003) based on Openshaw's work (1977) on automated zoning procedures. As a result, we got 'census tracts' with an average size of 1,081 persons in 2001 and 1,143 in 2011. The limits of the census tracts in 2001 and 2011 do not correspond completely; therefore, minor changes in location quotient maps of different years could be attributed to these border changes, and not to actual changes in the social structure. However, this does not affect the general picture of socio-economic segregation in Vilnius.

The housing zones of Vilnius

We categorized census tracts into three major housing zones according to the dominant housing type, density of population, period of construction and location (Figure 5.3). We distinguished the inner city, large housing estates, and the outer ring of the city. The inner city could be divided into two parts. The central inner city covers the most prestigious locations of the historical city and former villa areas. The remaining part of the inner city consists of the oldest working class neighbourhoods. The housing estate zone consists of high-rise multi-family buildings (5–12 storey) and houses around 70% of the Vilnius population. The quality of housing increases with distance from the city centre, but the price levels are quite similar within this zone. The outer city is dominated by low-density single-family neighbourhoods and extends beyond the city limits. It includes newly suburbanized areas, old collective gardens (datcha), previous satellite towns, industrial areas and rural settlements that were recently incorporated into the city limits. There is a great division between the southern industrialized part, which includes former rural and suburban settlements with relatively low-quality housing, and the northern part, where new and more expensive single-family houses dominate.

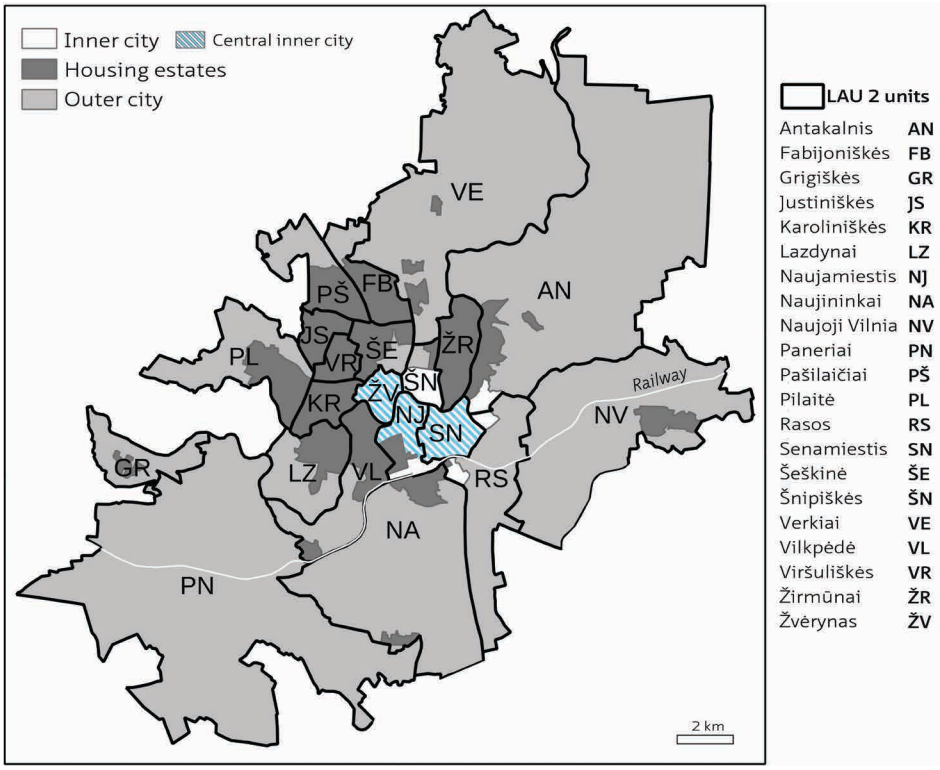

FIGURE 5.3 Main housing zones and LAU 2 regions of Vilnius
Source: Census 2011, Statistics Lithuania, authors' map

Different zones showed different trends in population change in the post-Soviet period. Since the early 1990s the sharpest population decline occurred in the inner city. It lost 40% of its population between 1992 and 2011. This was mostly related to the process of commercialization, when the housing function was taken over by the offices, shops and catering establishments. An improvement in living conditions (increasing floor space) in the prestigious central locations was an important factor as well. The zone of large housing estates saw a population decline of around 15% since the 1992. At the same time, the population was constantly increasing in the outer city due to the process of suburbanization: in some LAU 2 regions the population doubled between 2001 and 2011.

§ 5.4 Results

Labour market and occupational structure

After the 'full employment' in the Soviet-era, 40% of jobs in Lithuania were lost between 1989 and 2001, mainly in industry (loss of 260,000), construction (130,000) and agriculture (120,000) (Statistics Lithuania, 2015). In Vilnius, the number of workplaces decreased by 25% during this period. It took several years for the economy to recover, until new economic sectors (business and other services first of all) started to develop and bring down the levels of unemployment. Employment and earnings grew rapidly and steadily in all economic sectors of Lithuania between 2001 and 2008. However, this growth had almost no effect on the income gap, which, according to the Gini index was constantly among the highest in the European Union (Eurostat, 2015). For example, the gross salary of managers was 3.4 times higher than that of unskilled workers in 2010 (Statistics Lithuania, 2015). That is more than in other Baltic States (2.6–2.9), but less than in most of the CEE countries (3.6–4.0).

Significant transformations of the occupational structure took place in Vilnius during the first decade of the twenty-first century (Table 5.1). First of all, there was a sharp increase of high occupational groups: 32% increase for managers and 46% for professionals. In contrast, there was a decrease in low occupational status groups: minus 24% for craft workers and minus 28% for machine operators (an exception is a slight increase for service workers). The increase of high-status groups is illustrative for a concentration of capital and high-value added economic sectors in the capital city; in Lithuania as a whole, the share of managers increased by 2% and the share of professionals increased by 5%. The decrease of the low-status group (it was the largest group previously) can be explained by shrinking construction and related industry sectors, as a result of the global economic crisis (this resulted in a peak of emigration in 2010) and deindustrialization.

ABBR.	ISCO	OCCUPATIONAL GROUP	2001	2011	2001-2011	2001-2011	2001	2011	2001-2011
			000s	000s	000s	%	%	%	pp
MAN	1	Managers	28.4	37.5	9.1	**32.0**	11.1	13.6	2.5
PRO	2	Professionals	55.0	80.3	25.3	**46.0**	21.4	29.1	7.6
APR	3	Associate professionals	27.0	27.5	0.5	1.9	10.5	9.9	-0.6
CLE	4	Clerks	11.7	11.0	-0.7	-6.0	4.6	4.0	-0.6
SER	5	Service workers	27.5	28.1	0.6	2.2	10.7	10.2	-0.6
CRA	7	Craft workers	30.6	23.3	-7.3	**-23.9**	11.9	8.4	-3.5
MAC	8	Machine operators	19.4	14.0	-5.4	**-27.8**	7.6	5.1	-2.5
UNS	9	Unskilled workers	15.5	15.6	0.1	0.6	6.0	5.6	-0.4
UNE	-	Unemployed	41.5	39.2	-2.3	-5.5	16.2	14.2	-2.0
Total			**256.6**	**276.4**	**19.8**	**7.7**	**100**	**100**	
Aggregated data									
	1-2	High	83.4	117.8	34.4	41.2	32.5	42.6	10.1
	3-4	Middle	38.7	38.5	-0.2	-0.5	15.1	13.9	-1.1
	5-9	Low (unemployed included)	134.5	120.1	-14.4	-10.7	52.4	43.5	-9.0
Missing data									
		Occupation not indicated	26.1	14.5	-11.5	-44.0	12.1	6.2	-5.9
Total employed			**241.2**	**251.8**	**10.6**	**4.4**			

TABLE 5.1 Changes in the occupational groups in Vilnius between 2001 and 2011
Source: Census 2001, 2011, Statistics Lithuania, author's table

Occupational segregation in Vilnius according to the global indices

This section presents the main findings of occupational segregation in Vilnius and its main housing zones. We use an index of segregation (IS) and index of dissimilarity (ID) to study the evenness, and an index of isolation (II) to study the exposure dimension of occupational segregation. The values of all analysed global indices were low in Vilnius in 2001. This means that the representatives of different occupational groups were distributed quite evenly throughout the city and had a high chance to meet each other in each neighbourhood. A specific feature of Vilnius, compared to other CEE countries, was the high share of bipolar neighbourhoods: 34% higher than in Tallinn and much more than in Budapest, Prague or Warsaw (Marcińczak et al., 2015). Hypothetically this could be explained by social differences within the occupational groups, which means that occupationally bipolar areas do not necessarily reflect income polarisation. It is likely that the housing estates are inhabited by middle- and low-income population from all professional groups (this could also be confirmed by an absence of higher-class cars in the courtyards of these neighbourhoods).

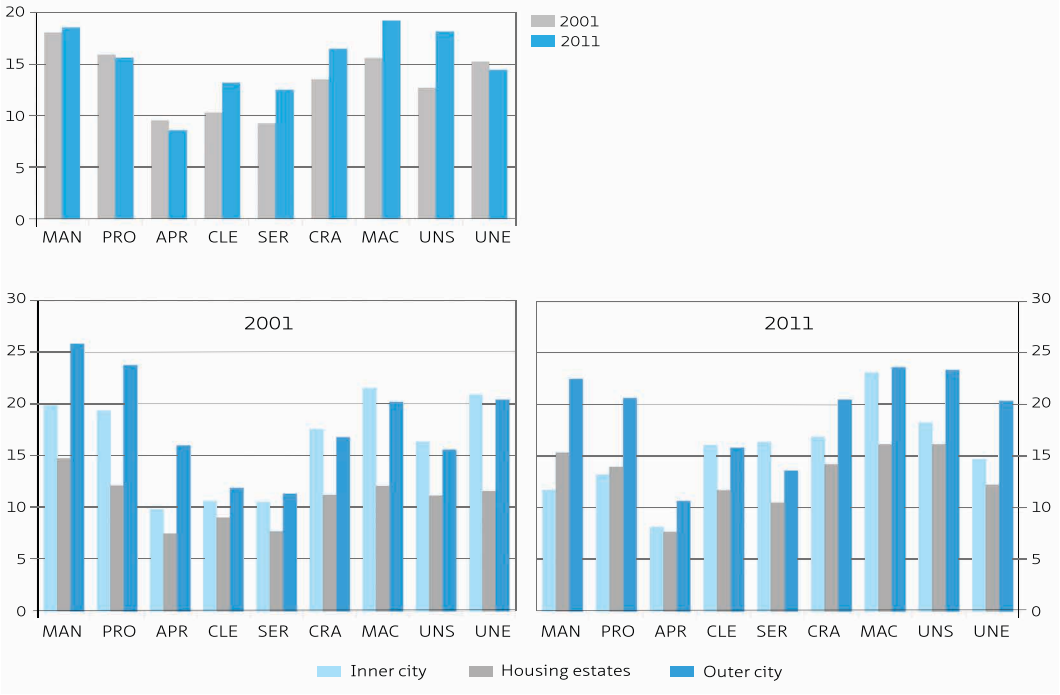

FIGURE 5.4 Indices of segregation
Source: Census 2001, 2011, Statistics Lithuania, authors' graph

Additionally, a high degree of homogeneity (in terms of balance between quality, price levels, prestige, accessibility, etc.) of the housing estates does not create substantially higher or lower demand for certain locations and therefore there is no strong sorting factor for different occupational groups. The lowest-income groups could afford living in the Soviet-era housing estates because of the mentioned heating compensation mechanism.

The analysis of IS for the city as a whole shows only minor changes in the evenness of distribution over the ten-year period (Figure 5.4, above). Segregation was still low in 2011 (below 20 for all occupational groups). There was only a modest increase among the middle- and lower- occupational groups and segregation remained constant for the highest-occupational groups. However, we find that the overall city-wide picture masks more detailed processes in the different housing zones; segregation is higher in the inner city and outer city compared to the housing estates (Figure 5.4, bottom). Furthermore, we can observe an increased evenness of distribution of the higher-occupational groups in the inner city and outer city. There is a different situation in the case of the lower-occupational groups. Their IS increased slightly in the housing estates and inner city (service workers were an exception – for them IS increased by 6% in the

inner city) but substantially in the outer city. This shift, together with the decrease of IS for the higher-status groups, led to a situation where the lower-occupational groups were least evenly distributed in 2011, especially in the outer city. The changes did not have a clear structure for the middle groups; IS mainly decreased for associate professionals and increased for clerks.

New housing construction which took place during 2001–2011 often had an infill character. Higher-quality new housing stock is scattered around the whole city and is not concentrated in a specific area. The previously mentioned mechanism of compensation for heating costs reduces any incentives for lower-income homeowners to move out from their 'luxury' (usually only in terms of space) apartments. Additionally, the loan policy of banks is redistributing the higher-income groups (especially young families with small savings) to the new housing estates, mostly located in the periphery of the city. To sum up, socio-economic segregation in Vilnius is strongly conditioned by the housing estates, which have bipolar occupational structure reaching the higher levels in the outer city. IS would be higher if the study included the suburban neighbourhoods outside the city limits, where the higher social groups strongly dominate (Krupickaitė, 2014). Global measurements of IS are not always sufficient when trying to evaluate ongoing processes under such circumstances, because growing uniformity in some areas may mask growing inequalities in others.

While the city-wide index of segregation is below 20 in Vilnius, which means even distribution of occupational groups, the index of dissimilarity (ID) tells a different story. Figure 5.5 shows the ID for different occupational group combinations in 2001 (ID values in the below triangles) and 2011 (ID values in the higher triangles). The most evident trend (although not unexpected) is the increasing separation of the highest-occupational groups from the lowest-occupational groups. The growth between social and spatial distance is also visible in the housing estates' zone. Although the separation between managers and professionals was already low in 2001, it reduced even more in 2011. This implies that the higher-status groups moved closer to each other in all parts of the city. This might also explain why the IS did not increase for managers as much as, for example, in Tallinn (Tammaru, Musterd, van Ham, & Marcińczak, 2016).

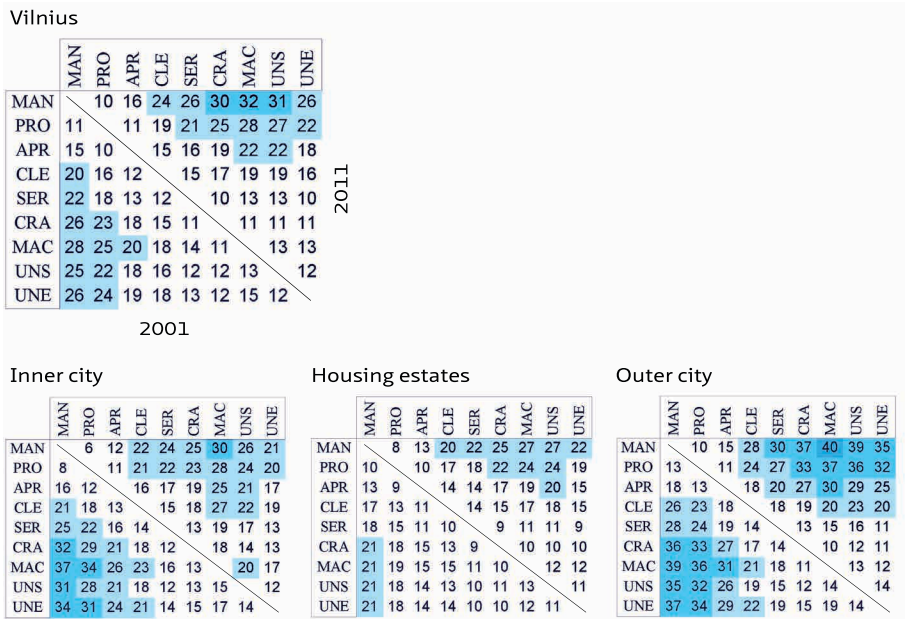

FIGURE 5.5 Indices of dissimilarity
Source: Census 2001, 2011, Statistics Lithuania, authors' table

Next, we will analyse the exposure dimension of segregation. Figure 5.6 shows the distribution of occupational groups within the city in 2001 and 2011. The results show high and increasing levels of isolation for the higher-occupational groups. This trend is in line with previously established concentrations of the higher socio-economic groups in the most attractive locations of Vilnius (especially managers in the central inner city and suburbs). Apparently, all occupational groups, except the higher ones, tend to live less isolated from each other. The lower the occupational status, the less isolated they are in all housing zones. The profiles in Figure 5.6 permit us to speculate that the higher-occupational groups are more residentially mobile than the lower-occupational groups. Though most of the groups are quite evenly distributed across the city, their isolation from each other is high within the neighbourhoods. Higher-occupational groups are large in Vilnius (Table 5.1), which mainly explains why they are strongly isolated from the rest of the workforce; i.e. they mainly potentially meet own-group members in the neighbourhoods they live in.

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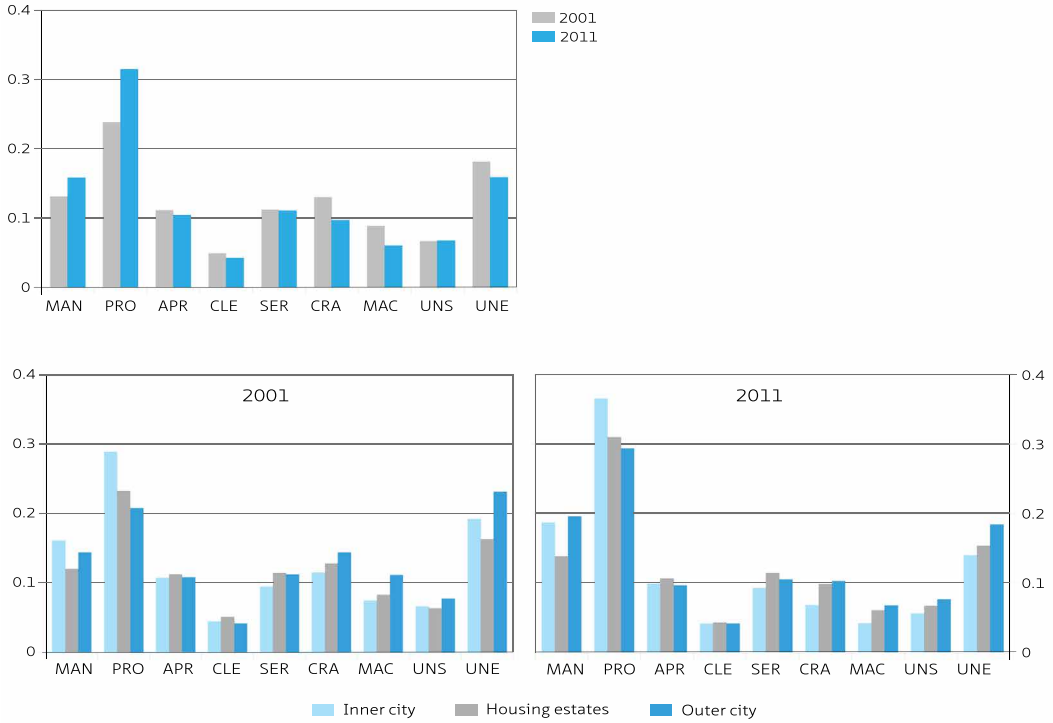

FIGURE 5.6 Indices of isolation
Source: Census 2001, 2011, Statistics Lithuania, authors' figures

When analysing changes in the different housing zones, it can be seen that the higher-occupational groups experienced the fastest growth of spatial isolation in all of them. In 2011, managers' isolation in the outer city exceeded their previous isolation in the inner city, which could be seen as a sign of 'elite' suburbanization. The middle-status groups are the most stable and the most evenly distributed in Vilnius. Two low-occupational groups (craft workers and machine operators) became less isolated in the inner and outer city in comparison to the housing estates. It could be an outcome of the overall decrease of their proportion in the occupational structure.

To sum up, our results show the growth of spatial isolation of higher-occupational groups, while isolation of the other groups is decreasing. Most likely this happened due to a growing share of managers and professionals in the workforce. The results also show a relatively low and stable isolation of the middle-status groups, with a moderate and increasing spatial separation of the higher-occupational groups.

Changing local patterns of segregation

Finally, we will analyse the geography of segregation by using location quotient (LQ) maps. This is a way of quantifying how concentrated a particular group is in a certain area compared to its concentration in the city as a whole. We have already established that a more uniform distribution of the higher-occupational groups was caused by their overall increase in the occupational structure of Vilnius. At the same time Figure 5.7 shows that they live in the most attractive locations in the inner and outer city. The concentration of the highest-status groups is the biggest (and growing) in the northern part of the outer city. We also observe their concentration in the peripheral parts of the southern outer city, but not in its more central industrial areas. Managers and professionals also spread into the formerly low-status areas within the inner city (former working-class neighbourhoods). This is why their distribution became more even there despite growing isolation from other groups in each neighbourhood. An increasing concentration of managers and professionals is visible in the tracts with the biggest post-Soviet housing estates. These are the new in-built neighbourhoods, mostly in the northern part of the city and formerly uninhabited areas next to the inner city. The concentration of higher groups is decreasing in the most typical Soviet-era neighbourhoods in the western part of the housing estate zone (Lazdynai, Karoliniškės, see Figure 5.3) and some northern areas (Fabijoniškės, Antakalnis). These are the only areas where the number of managers was dropping notwithstanding their general increase by 32% in Vilnius.

The middle-occupational groups are the smallest and least segregated in Vilnius (map is not shown). The LQs for the unskilled workers (Figure 5.8) are higher than for most other groups and as high as in the case of managers. Unsurprisingly, the distribution of the unskilled is very different compared to the highest-occupational groups. The concentrations of unskilled workers in the southern and the least-attractive northern locations of the outer city (often old settlements with mixed ethnic composition) increased, and as a result a sharp gradient between the north and south of the city developed. Apparently because of the rising rental prices, lower-occupational groups are being pushed out of the city centre to more distant locations, especially to the south.

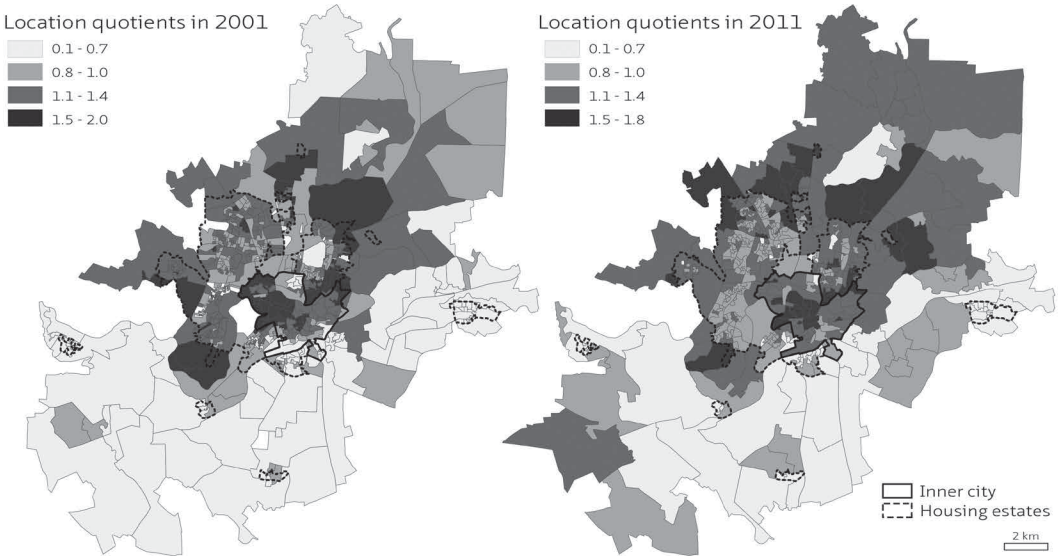

FIGURE 5.7 Location quotient maps for the managers and professionals
Source: Census 2001, 2011, Statistics Lithuania, authors' maps.

Finally, an important issue is the growing concentration of the low-status workers in the declining housing estates. We identified the main concentration areas of the low-status workers. The first and largest one covers almost entire southern part of the city; the concentration of the low-status group was high and increasing there. Traditionally it has been a low-status area located to the south of the railway that is dominated by the sparsely populated industrial zones and involves only a few housing estate tracts. The concentration of the low-status workers is also increasing in the tracts of the quite central Soviet-era district Žirmūnai, built in the early 1970s, and it is most likely related to the former low-skilled workers' hostels, which are concentrated near the former industrial facilities. The increasing share of the low-status workers is also noticeable in the relatively new densely built-up Soviet-era neighbourhood Šeškinė (see Figure 5.3). Most of the 'darker' exclaves outside the core city are the former satellite settlements with their distinctive inherited social and ethnic structure and low-quality housing stock. One of the typical evidences of segregation processes could be illustrated by the deconcentration of the low-skilled groups from the northern part of the outer city close to the housing estate zone. These locations are attractive for the suburban developments and therefore the low-status population is being displaced (LQ below 0.7).

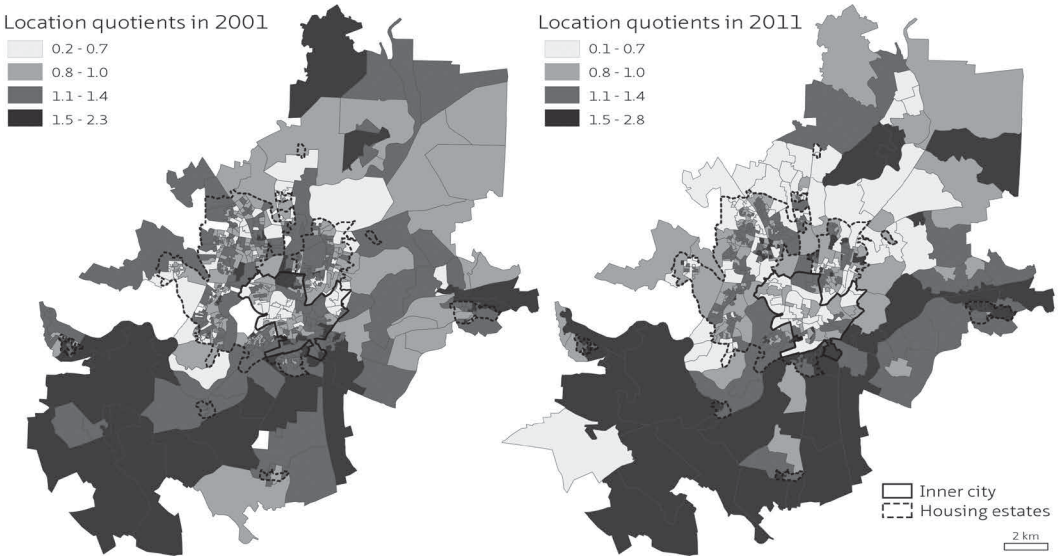

FIGURE 5.8 Location quotient maps for the unskilled workers
Source: Census 2001, 2011, Statistics Lithuania, authors' maps.

§ 5.5 Conclusions and discussion

Like other East European capital cities, Vilnius experienced significant changes in its socio-spatial structure during the last decades. The processes of suburbanization, gentrification and the professionalisation of the workforce made us to expect increasing socio-economic segregation in Vilnius. Our main findings are as follows. The index of segregation, which indicates how evenly occupational groups are distributed across the city space, showed that segregation in Vilnius is low and quite stable, with a minor trend of growing inequality in the distribution of the middle- and lower-occupational groups and stability of higher-occupational groups. On the housing zone level, we found an increasing concentration of wealthy households in the inner city and suburbs. The index of dissimilarity, which compares a distribution of two selected groups, showed the increase of spatial distance between lower- and higher-occupational groups. The exposure dimension brought this out even more clearly: the isolation for the higher-occupational groups increased significantly in the 2000s, while it decreased for other occupational groups. This is a result of residential mobility of more affluent households, which concentrate in the best inner and outer city locations.

We also used location quotient maps to explore the local patterns of occupational segregation. Like segregation indices, the maps showed the concentration of higher-occupational groups in the inner city and in the suburban zone in parallel with shrinkage of the middle- and lower-occupational groups there. The inner city is undergoing a wave of gentrification, since the share of professionals is increasing even in the formerly lowest-status areas. The middle-occupational groups have been dispersed throughout the rest of the city. The typical Soviet-era estates lost more affluent groups. The lower-occupational groups tend to concentrate in less-attractive southern part of the city and more distant areas, including the former satellite settlements, which is a sign of increasing deprivation in the worse locations. We find that lower- and higher-occupational groups are still living side by side in the large Soviet-era housing estates, but trends of change in the specific parts of the city are in line with the existing literature, stating that growing social inequalities will result in higher segregation. Finally, our results show that the historical divide between the relatively rich north and the poor south of the city is deepening. The corresponding pattern of the distribution of ethnic minorities permits us to speculate on the ethnic dimension of the socio-economic segregation as well.

In general, our results show that the socio-spatial structure in Vilnius is quite stable. This could be explained by an exceptionally high share of the large housing estates, a concentration of workers in Vilnius from all over the country, the state social policy (heating subsidies) and the low supply of new higher-quality housing across the city. The absence of more rapid segregation could also be related to the low incomes of most of the occupational groups (low-middle, middle and even high-middle). The majority of households cannot afford anything other than an apartment in the Soviet-era or new economy-class housing estates. Such a situation keeps the demand for the ageing Soviet-era housing estates stable and prevents them from degradation.

To conclude, the legacy of the Soviet-era settlement system, without a strong dominance of a capital city, and an exceptionally large share of housing estates with their uniform character, have created special conditions for the socio-economic segregation of Vilnius. Our results show the main outcomes of socio-economic segregation under the conditions where market forces work in conjunction with the weak welfare state and a limited supply of high-quality housing. The Soviet-era housing estates, especially those in the more distant locations where the population is ageing, become stagnant and unattractive for younger or more affluent people. The contemporary state of such housing might be called ‘calm before the storm’ because the demand of such housing could drop drastically as incomes of higher- and middle-occupational groups start to increase. This would result in large-scale deprivation and an intense growth of city-wide segregation in Vilnius.

Acknowledgments

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6 Socio-ethnic segregation in the metropolitan areas of Lithuania

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Abstract

One of the specific features of many post-Soviet cities is their multi-ethnic structure, which was strongly influenced by internal migrations within the Soviet Union. Political and economic reforms in the 1990s led to changes in ethnic composition, and the attention given to the processes of ethnic-segregation has started to increase. While most studies focus on capital cities, much less is known about second-tier cities. This article examines the interrelationships between ethnic and social segregation in the metropolitan areas of Lithuania (Vilnius, Kaunas, Klaipėda). The authors use Lithuanian census data from the years 2001 and 2011 to obtain insight into the recent changes in the socio-spatial differentiation of the largest ethnic groups: Lithuanians, Poles, and Russians. The results show a clear relationship between the socio-economic and ethnic status of the residents of metropolitan areas and, therefore, suggest that ethnic segregation is strongly linked to the general processes of social segregation. The findings also show that the higher the proportion of a certain ethnic minority group in an area, the higher the proportion of lower (social) status residents in this group. In addition, in such cases, ethnic minorities often tend to concentrate in particular areas within the cities.

Keywords

Socio-ethnic segregation; metropolitan areas; Lithuania

§ 6.1 Introduction

The transition from the Soviet regime to a market-led neo-liberal economy resulted in the demise of public housing policies and rapid sprawl in metropolitan areas (MAs), mostly through the processes of weakly planned and unregulated residential suburbanisation (Borén & Gentile, 2007; Gentile, Tammaru, & van Kempen, 2012; Hamilton, Andrews, & Pichler-Milanovic, 2005; Sailer-Fliege, 1999; Sýkora & Ouředníček, 2007). Nowadays, much attention in the literature is paid to capital cities and their MAs, where the centralisation of the economy and population has resulted in the most intense and most visible urban sprawl (Smętkowski et al., 2011; Ubarevičienė, Burneika, & Kriaučiūnas, 2011). Social and ethnic segregation research has also focused on capital cities (Tammaru, Marcińczak, van Ham, & Musterd, 2016). Much less attention has been given to second-tier cities and their MAs, though similar processes should be found there too, while the problems connected with these areas could be even more serious. Links between urban sprawl and segregation are rather straightforward since suburbanisation is strongly associated with population redistribution and it is also related to income differences between different social groups.

This article seeks to obtain more insight into the interrelationships between social and ethnic residential differentiation in three major MAs of Lithuania formed by the cities of Vilnius, Kaunas, and Klaipėda. These three cities, with their distinctive historic development, geographical location, urban structure, economy, demographic, and, most importantly, ethnic structure, as well as their different trends in current growth, have started to play a new role in the fast-changing Lithuanian settlement system. In the rapidly-shrinking country, they are the only macro-regional centres that still have the potential to grow, even though a decline in the population is evident in the cities' central parts, which mostly consist of densely built-up high-rise Soviet buildings. In Lithuania, the process of population redistribution should be most visible in these three MAs because, apart from the nationwide trend of population decline, these territories are also experiencing an inflow of new residents. It can be expected that the significant spatial transformation of the MAs has been accompanied by major changes in their social structure, such as an increase in social and ethnic segregation. Recent research (Burneika, Ubarevičienė, & Valatka, 2016; Valatka, Burneika, & Ubarevičienė, 2016) has already revealed an increase in socio-economic segregation in Lithuania. However, little is known about the trends of ethnic segregation in the MAs. The analysis of three different MAs could help us to understand to what extent ethnicity can be associated with socio-economic status in Lithuania.

The ethnic differences between the populations of Lithuanian MAs make their comparison of special interest. They also help to reveal the relationships between the size of ethnic minority groups and their socio-spatial positions in different MAs. This article aims to explore the ethnic composition of the MAs and determine the links between ethnic composition and the general processes of socio-spatial residential differentiation. We seek to learn whether different ethnic groups can be associated with different socio-economic statuses and whether these groups tend to occupy different urban spaces. We expect to find that the MAs of Lithuania have different ethnic landscapes and trends of segregation. Our hypothesis is that the share of ethnic minorities in a city or area and the size of their communities have a substantial influence on the socio-economic positions of ethnic minorities in society. We also assume that the inherited (from the Soviet period) ethnic landscape started changing after free market forces (which are weakly controlled by neoliberal economic policies) had begun to play their role. However, the question remains whether spatial residential differentiation has started to disappear or, on the contrary, is increasing. We expect that the recent changes can be related to the positions that particular groups of ethnic minorities have in particular cities and to the urban spaces they traditionally occupy. Bearing in mind the different conditions behind the formation of ethnic groups in the MAs, we expect that the socio-economic differences among the ethnic groups will be noticeable and will differ between MAs. This is also one of the motives for including three MAs in the analysis. However, the Vilnius MA receives more attention because of the unique spatial pattern of ethnic composition there and the greater intensity of the segregation processes.

In this article, we use the concept of segregation to highlight the spatial differentiation of certain groups, but we do not try to characterise the type of processes observed. There are no reliable data that would help to identify the exact reasons for spatial differentiation (and differences between ethnic groups in particular) in Lithuania. The negative and positive aspects of segregation will not be discussed here either. However, we can state that both can be found and the negative aspects are dominant (see van Kempen & Özüekren, 1998).

We use individual-level and census-tract level sets of Lithuanian census data from 2001 and 2011. Cartographical and statistical methods (descriptive and correlation analysis, logistic regression) are used in the analysis. Occupational status is used as a proxy for socio-economic status.

§ 6.2 Social and ethnic segregation - the theoretical perspective and previous studies

Processes of social and ethnic segregation are as old as cities themselves. Greater scientific attention to this phenomenon is associated with the famous Chicago school of sociology dating back to the beginning of the previous century (van Kempen & Özüekren, 1998). The studies from that time were already outlining the importance ethnic (racial) dimensions held for the processes of social segregation.

Segregation (or spatial segregation) can be defined as the residential separation of groups (ethnic, social, etc.) within the broader population. According to the *Dictionary of Human Geography*, 'the phenomenon of segregation is said to occur when two or more groups occupy different spaces within the same city, region or even state' (Hiebert, 2009, p. 673). In this sense, segregation basically corresponds to the concept of socio-spatial residential differentiation. The concept of segregation is sometimes used to stress the 'forcible' nature of the process, as low-status groups are pushed out of the best locations and start to concentrate in less attractive places or in places that at least to some extent they would prefer not to live in (Briggs & William, 2005; Žilys, 2013) . The term 'concentration' (or spatial concentration), also used in this paper, indicates the overrepresentation of certain groups in certain areas. Particular groups can be distinguished according to their income, ethnicity, race, occupation, etc. (Massey & Denton, 1988). In this article, we use the concept of 'socio-ethnic segregation' to determine residential differentiation, which is based on two parameters of a group, namely its social status and ethnicity. Empirical research has only recently begun to analyse the relationships between different forms of segregation (Clark & Blue, 2004). This article is the first study that explores these interrelationships in Lithuania. Here we assume that socio-ethnic segregation exists if groups of distinctive social status and ethnic origin live separately from one another. In this case, different ethnic groups have a different social status and live in different spaces.

Studies of residential differentiation and ethnic segregation have been carried out in many Western countries since the beginning of the last century. Research based on quantitative data analysis revealed that there were three principal dimensions of a residential structure: class, race, and household structure, and they were typical of many cities (Hamnett, 1996). In Western cities (first of all, North America), the housing segmentation of ethnic minorities, who usually live in less desirable housing, generally has two traditional causes which could be identified as micro- and macro-level factors (structure and agency alternative). First, ethnic minorities often have fewer resources, which limits their ability to acquire housing. Second, discrimination in the housing market might restrict their choices (Bolt & van Kempen, 2010; Semyonov &

Glikman, 2009). For example, in the United States, there has been a long history of African Americans living in poor housing conditions (Massey & Denton, 1993; Wilson, 2012). Although the processes of spatial differentiation of ethnic minorities in Western European cities have been studied for several decades, their findings provide little help in understanding ethnic landscapes and their formation processes in post-Soviet cities. At present, ethnic diversity in Western Europe in many cases may be regarded as a result of post-colonial processes, while ethnic diversity in the Baltics can mostly be deemed the result of colonialism. Ethnic minorities (or, in fact, majorities, if we count the whole Soviet Union) that migrated to Baltic cities were not in disadvantaged socio-economic positions. This is likely to have changed after post-communist reforms were introduced, which included property restitution and the strengthening of the position of national languages in public and institutional life. Studies of residential segregation in the former Soviet Union have also revealed significant ethnic differences in housing and residential patterns (Gentile & Tammaru, 2006; Kulu & Tammaru, 2003; Milstead, 2008; Ruoppila, 2004). In the former Soviet Union, rapid industrial growth was followed by the immigration of Russian-speakers (mainly from Russia) to other republics, which prompted a desperate need for new housing that was instantly met in the form of high-rise multi-family complexes (Rybakovskiy & Tarasova, 1991).

Studies of countries that share a similar historical pathway as Lithuania in the 20th century have shown the residential differentiation of ethnic minorities to be distinctive in character (Krišjāne, Bērziņš, & Kratovitš, 2016; Tammaru, Kährik, Mägi, Novák, & Leetmaa, 2016) and quite different from what has been observed in Western cities. However, this is to be expected when one considers the historical circumstances that led to the formation of highly multi-ethnic urban landscapes. In many post-Soviet cities, ethnic residential differentiation was shaped during the Soviet period, and since then the changes have been too modest to overcome the inherited patterns of housing segmentation (Hess, Tammaru, & Leetmaa, 2012). Once established, the residential differentiation of ethnic minorities is long-lasting, even when ethnic minority groups experience changes in their social status and when significant societal transformations occur. Ethnic housing integration was also limited in the course of post-Soviet transition. A study of the second-largest Estonian city, Tartu (Hess et al., 2012), showed that Russian-speaking immigrants are overrepresented in modern Soviet housing estates equipped with better facilities, while Estonians are overrepresented in single-family housing. A study carried out by Gentile and Tammaru (2006) in Ust'-Kamenogorsk, Kazakhstan, interestingly showed that the housing conditions of native Kazakhs were considerably worse than those of Russians and other ethnic groups in 2001.

The latest research on the Baltic capital cities has shown that the situation is quite different among the three countries. Tallinn appears to be one of the most segregated European cities in terms of both ethnic and socio-economic segregation (Tammaru,

Kährik, et al., 2016). Riga, by contrast, is ethnically one of the least segregated cities (Krišjāne et al., 2016). Though there are many studies on ethnic minorities in Lithuania, and especially on the country's multi-ethnic south-eastern region (Frėjutė-Rakaskaunė, 2015; Gaučas, 1997; Korzeniewska, 2013; Pileckas, 2003), little is known about ethnic segregation. On the other hand, studies suggest that in Vilnius socio-economic segregation might be linked to ethnic segregation (Milstead, 2008; Valatka et al., 2016). Moreover, it has been revealed that the sprawl of the Vilnius MA has had an effect on both the socio-demographic and the ethnic structure of the area (Burneika, Ubarevičienė, & Pociūtė, 2013; Ubarevičienė, Burneika, & van Ham, 2015). Therefore, the empirical part of this paper will shed more light on the interrelationships between ethnic and socio-economic segregation in the major MAs of Lithuania.

§ 6.3 Data and methods

This article analyses the patterns of socio-ethnic segregation in three major MAs in Lithuania, namely Vilnius (635 480), Kaunas (392 313), and Klaipėda (210 635). MAs consist of urban cores and suburbs but also cover less urbanised rural areas where suburban settlements are mixed with rural ones (Smętkowski et al., 2011). Their limits, which illustrate the dispersion of suburbanisation processes, were determined at the level of LAU 2 regions and three indicators were taken into account: a change in the population between 2001 and 2011, the number of new single-family houses (built after 2006), and in-migration (the number and origin of newcomers in 2010–2011[29]). We use the term 'city' to refer to the city municipality in its administrative borders.

Our study uses Lithuanian census data from 2001 and 2011. We use census tract level data to illustrate the ethnic composition of the metropolitan areas and *seniūnija* level (LAU 2 statistical regions) data to monitor changes in the ethnic structure of the MAs.[30] Individual-level data are used to explore the relationships between the socio-economic and ethnic characteristics of individuals.

29 The census only captures population moves in the last 12 months prior to the census.

30 Although we would prefer to use census-tract level data to track changes in ethnic composition, georeferenced data on the census-tract level were not available for the 2001 census.

A spatial scale is an important dimension for analysing segregation processes because segregation on a lower scale does not necessarily mean segregation on a higher one or vice versa. For example, on the local administrative level of *seniūnija* (~20 000–30 000 residents), ethnic segregation in Vilnius is minimal since Lithuanians make up the majority of the residents in all these regions. However, if we look at the census tracts level (~600 residents), we find that in some areas Lithuanians make up less than 15% and in other areas more than 90% of the total population. The modifiable areal unit problem (MAUP) is well known in geography. It mostly rises from the imposition of artificial units of spatial reporting on continuous social (geographical) phenomena (Heywood, Cornelius, & Carver, 1998; Openshaw, 1984). Therefore, any illustrated patterns distort reality and those distortions depend on the accuracy of the delimitation of the units in use. On the other hand, it can be assumed that the more detailed the spatial scale is, the more accurate the picture of reality that is obtained.

We use self-reported data on ethnicity to analyse residential differentiation of Lithuanian, Polish, and Russian ethnic groups. These are the main ethnic groups in the studied MAs and in Lithuania overall. Although some other ethnic groups of Soviet Union origin are also quite numerous in Vilnius, they make up several times smaller communities in the other cities and regions. Data on the mother tongue could be interesting as well, because many immigrants from the former Soviet Union use Russian as their communication language. However, this alternative would raise certain problems due to the fact that many Poles also use Russian as their mother tongue.

Statistical methods (descriptive and correlation analysis, logistic regression) were used in the analysis, which are based on the ethnic and occupational structure of residents. We used aggregate data at the level of census tracts not only to map the ethnic landscape, but also to explore the relationships (correlations) between the share of a particular ethnic group and various socio-economic characteristics in different MAs. A series of logistic regression models (on the individual level) were run to indicate whether there are significant differences between individuals belonging to different ethnic groups and their socio-economic characteristics. The socio-economic characteristics included the following variables: university education, high-ranking occupation (managers and professionals), unskilled workers,[31] and the unemployed.

31 We use the International Standard Classification of Occupations (ISCO) provided by the International Labour Organization (2012).

§ 6.4 Results

The ethnic composition of the major metropolitan areas in Lithuania

The frequent shifts in political borders in the 20th century have had a profound impact on the current ethnic structure of Lithuania. In this respect, the MAs of Lithuania are rather different from one another and that makes their comparison interesting - including in an international context. The Kaunas MA can be described as mono-ethnic, with a small Russian community. In Vilnius, Polish-identity residents constitute the largest minority group (followed by Russians) and Polish residents dominate the region surrounding the city. Klaipėda has the highest share of the Russian minority compared to the other Lithuanian MAs and therefore more resembles Tallinn and Riga.

Vilnius has always been the most multi-ethnic city of Lithuania (Stanaitis & Česnavičius, 2010). The population of Vilnius City decreased by more than twice just after the Second World War. Two events were responsible for this significant change. First, the Holocaust reduced the Jewish population from 57 000 to 2000 (Jews had made up 30–50% of the total population at various points in time since the 15th century) (Mendelsohn, 1983; Vaitiekūnas, 2006). Second, the war marked the end of Polish governance[32] and the beginning of the Soviet period. This shift in power was accompanied by Polish repatriation—107 000 Poles (the majority of the city population before the Second World War) left the city between 1945 and 1947 (Czerniakiewicz & Czerniakiewicz, 2007; Daukšas, 2008). Repatriation from the surrounding region was much smaller in scale (Eberhardt, 2011). As a consequence, the later expansion of the city's administrative limits took place in areas dominated by the Polish population. After the Soviet regime established itself, mass industrialisation accelerated the growth of Vilnius City and led to a rapid increase in its population. Vilnius City began to fill up with immigrants, most of whom were from other parts of Lithuania, but also from more remote areas of the Soviet Union. On the other hand, the inflow of Russian-speaking people to Vilnius (and other industrial centres of Lithuania) was not as intensive throughout the Soviet period as it was in other Baltic capitals; consequently, the share of Russians in Lithuania remained much smaller. A unique ethnic landscape eventually took shape in the Vilnius MA, with the core city dominated by newcomers from Lithuania and from all over the USSR, and the surrounding region dominated by Poles (mostly of rural origin). Another period of change occurred after the

32 Between 1920 and 1939, Vilnius region was under Polish governance. The Polish population in this region grew during this period.

restoration of Lithuanian independence in 1990. Like in the case of many other post-Soviet cities, Vilnius, too, saw the departure of a number of Russian-speaking residents (Tammaru & Kulu, 2003). The beginning of suburban development, which was constrained under the communist regime, led to processes of urban sprawl, which has also started to affect the ethnic composition of the Vilnius MA. The maps in Figure 6.1 (top row) show in close detail (on the census-tract level) the ethnic landscapes of different ethnic groups in Vilnius City and its surrounding areas. The concentration of different ethnic groups is highly uneven. It is clear that Russians are overrepresented in the more industrialised urban core zones and in Soviet housing estate neighbourhoods, while Poles dominate in the former rural areas further from the metropolitan centre. At present, Lithuanians make up approximately 60% of all residents in the MA and 63.3% in Vilnius City; however, there are many census tracts (mostly in new suburbs) where the share of Lithuanians exceeds 90%. The share of Poles, who comprise 20.8% of the total population of the MA, exceeds 80% in the most peripheral parts of the MA (Statistics Lithuania, 2015). A combination of urban sprawl with these contrasts in the ethnic landscape can be expected to affect (increase or decrease) the processes of social segregation.

The population of Klaipėda was also completely reshaped during the Second World War. There were only 3600 residents in 1945 compared to 47 200 in 1938. The city had re-attained its pre-war size by 1950, but its social and, of course, ethnic structure had changed. What had been a German-Lithuanian city (57.8% and 30.3%, respectively, in 1926) became a Lithuanian-Russian one (73.9% and 19.6%, respectively, in 2011 (Statistics Lithuania, 2015)). During the Soviet period, the development of industry and sea-port activities in Klaipėda resulted in mass in-migration both from the rest of Lithuania and all over the USSR. As a result of in-migration related to Soviet industrialisation, Russians are overrepresented in Soviet housing estates in the southern and central parts of the city municipality (Figure 6.1, bottom row, right). Like the other cities, there was little in-migration of non-Lithuanians into the area surrounding Klaipėda, so the city and its suburbs remained almost purely Lithuanian in terms of the ethnic composition. Since Russians are the dominant minority group in the Klaipėda MA, the distribution of Lithuanians has a pattern opposite to that of the Russians and, therefore, there is no separate map shown (this is also the case of the Kaunas MA).

Although the population of Kaunas did not experience the extent of decimation during the Second World War and in the post-war period as the other two cities did, significant changes still occurred. The city lost around half of its pre-war population and grew quickly afterwards (pop. 155 000 in 1939, 80 000 in 1945, and 217 000 in 1959). Kaunas did not experience such drastic changes in its ethnic structure, and Lithuanians remained the dominant ethnicity there before and after the war. The proportion of

Lithuanians was constantly increasing and had reached 90% by the end of the Soviet period, and it continued to grow after that (93.7% in 2011). Russians are the biggest ethnic minority in Kaunas (3.8% in 2011), while other ethnic groups altogether make up 2.5% of the population. Lithuanians dominate throughout the MA and Russians represent a larger share of residents only in some specific areas. For example, in housing estates near industrial zones (which often used to have a military function) or in Russian Orthodox settlements from the 19th century, which are located on the periphery of the MA (similar villages can also be found in the Vilnius MA). In fact, Kaunas is the most mono-ethnic metropolitan city in the Baltics. Figure 6.1 presents a map (bottom row, left) showing the distribution of Russians in the Kaunas MA.

Migration was the main force that altered the ethnic structure of the MAs. Therefore, factors influencing migration flows and their directions should be considered those most important. One distinctive feature of Lithuania that has a strong influence on current migration flows is its uniform settlement system. The Soviet urban planning and development policy in Lithuania sought to curtail the growth of the country's biggest cities and especially Vilnius. Therefore, there is no one clearly dominant metropolitan area in Lithuania. No other European state of a similar size has such a uniform urban system. It is very likely that this is the main cause of the high migration rates (internal and outward) that led to the rapid change in the urban network in the post-Soviet period. It could also mean that there are more complex internal migration flows, where Kaunas and Klaipėda serve as alternative macro-regional centres, while high rates of out-migration from the peripheral regions of the country could be explained by their weak social ties to the capital city of Vilnius (where the best-paid jobs and education institutions are).

The three MAs are the major destination points in Lithuania, thus migration to these MAs is associated with changing ethnic structure. In addition, the actual absence of suburbs in Soviet cities resulted in fast suburban development later on. The suburban areas around the three major cities were the only areas in the country to gain population since the 1990s. Suburbanisation had to have some impact on the ethnic and social structure in both the cities and their surrounding areas for the same reason – namely, the ethnic differences between the city cores and their suburbs. Nowadays, suburbanisation is the main process changing the social and ethnic landscapes in the MAs. The actual consequences of this process will be revealed in the next chapter.

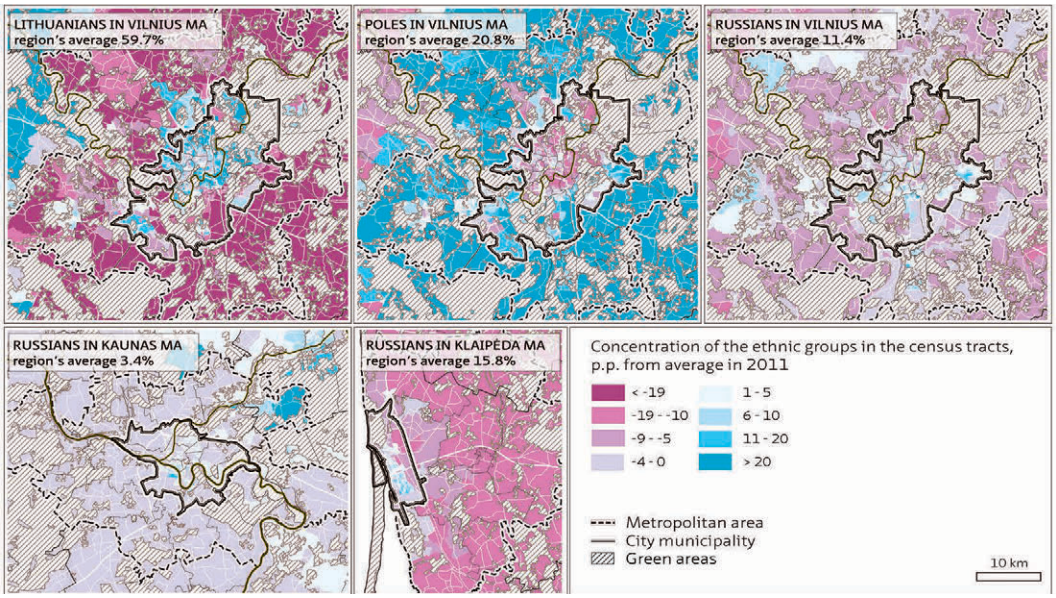

FIGURE 6.1 Ethnic landscapes of the metropolitan areas on the census-tract-level in 2011 (percentage points from regions' average)
Source: Authors' maps; Statistics Lithuania (2011)

Recent changes in the ethnic structure

Since the beginning of the new millennium, the processes of migration- and suburbanisation-driven urban sprawl have been the two major components of spatial development, and they have had a considerable impact on the transformation of the ethnic landscape in Lithuania. It can be expected that due to suburbanisation the ethnic structure of suburban zones should eventually converge with the ethnic structure of inner cities, from where the major flows of migrations towards the suburbs originate. However, it is known that migration is selective, and it is related to age, ethnicity, level of education, socio-economic status, etc. (Fratesi & Percoco, 2014; Tervo, 2000). Lithuanian census data from 2011 show that ethnic minorities are less likely to be involved in migration processes and that they are less likely to suburbanise than Lithuanians. This suggests that migrations within Lithuania should eventually lead to a decline in ethnic differentiation, especially in the Vilnius and Klaipėda MAs. On the other hand, emigration abroad from multi-ethnic regions might play a role in keeping the share of non-Lithuanians at a higher level. The most important question in this case is whether the migratory behaviour of different ethnic groups is similar in different MAs.

Significant differences in the initial ethnic structure of the three MAs determine the different trends in the recent change of ethnic composition. We can expect that the greater the differences between the city and the hinterland from which the city is gaining population, the more visible the changes in their ethnic composition are. Lithuanians make up more than 90% of the population in the hinterlands of all three MAs. This is also typical of Vilnius, which is the major destination point from all over the country. The analysis of the individual-level data showed that the flows of migration from Polish-dominated areas, which are located on the outskirts of Vilnius City, are lower than from more remote areas, where Lithuanians dominate. The greater the ethnic differences between the urban core and a suburban zone, the more visible the changes should be. In this case, the ethnic structure of the Vilnius MA, which is the most contrasting area of the country, should experience the most profound changes in its ethnic (and social) structure both in the city core and its suburbs. At the same time, regions with a more uniform ethnic structure should not experience significant transformations. The results of our analysis confirm this statement (Table 6.1, Figure 6.2). Due to the limitations of the 2001 census data, the analysis is carried out at LAU 2 level instead of the census tracts.

2011 (CHANGE FROM 2001 P.P.)	LITHUANIA	VILNIUS MA	KAUNAS MA	KLAIPĖDA MA
Lithuanians	84.2 (+0.7)	59.7 (+5.8)	94.1 (+0.5)	78.7 (+2.8)
Poles	6.6 (-0.1)	20.8 (-2.8)	0.3 (-0.1)	0.3 (0.0)
Russians	5.8 (-0.5)	11.4 (-1.9)	3.4 (-0.7)	15.8 (-1.9)
Others	3.4 (-0.1)	8.1 (-1.1)	2.1 (+0.1)	5.2 (-0.8)

TABLE 6.1 Ethnic composition in 2011 and the change in ethnic composition in 2001–2011 in the metropolitan areas
Source: Statistics Lithuania (2011)

The share of Lithuanians was increasing throughout the country during the last decade (by 0.7p.p.) (Statistics Lithuania, 2015), but the pace of change was greatest in Vilnius MA. The share of Lithuanians significantly increased in regions dominated by Poles (Figure 6.2 top row, left; compare with Figure 6.1). Our results show that Lithuanians have started to dominate in some parts of the suburban areas of Vilnius and, moreover, the share of Lithuanians has started to exceed the city average in some places there. This confirms that Lithuanians dominate among suburbanites, and the reasons for this may be higher incomes of the ethnic majority (Lithuanians) and/or the different locational priorities due to cultural differences. For example, according to the census data, in 2010, 74.6% of the residents that moved from the Vilnius city municipality to the most typical suburban area, namely Riešė *seniūnija,* were Lithuanians. The share of Russians dropped in the central part of Vilnius City (Figure 6.2, top row, right). It is likely that this trend illustrates the gentrification of the city centre, as less prosperous

ethnic minorities are being pushed out of well-situated areas. The ethnic structure is stable in the biggest Soviet housing estate neighbourhoods in Vilnius, which indicates ethnic equilibrium and/or absence of migrations there.

One could expect that changes in ethnic composition (especially in the context of a fragmented political field) would have certain negative social consequences, namely conflicts between ethnically and socially different communities. However, our earlier studies in the field showed that there are no serious social conflicts in the urban sprawl zone, where the ethnic identity of 'newcomers' and 'locals' usually differs. Interviews with local experts (representatives of local administrations and communities) were carried out in 2010–2011 in the Vilnius MA in order to establish the specific features of Vilnius's urban sprawl (Burneika & Ubarevičienė, 2011). Similar results were obtained from interviews carried out in 2014–2015 in the suburban zones of the major cities. Some tensions between local authorities and newcomers can be identified, but the reasons for them lie in the wealthier suburbanites' higher expectations with respect to communal (public) services and the limited resources of the local authorities to meet them. The planning and regulation of city sprawl was reported as insufficient by representatives of local administrative bodies.

The ethnic landscape of the Kaunas MA is the one that is the most stable (Figure 6.2, bottom row, left; the share of Russians is mapped). Both the city and its surrounding area are gaining population from areas where the Lithuanian population is dominant. However, certain areas with a larger share of Russian minorities (Soviet industrial-military zones and Russian Orthodox settlements from the 19th century in the north-east of the region) showed rapid changes in the ethnic structure over the past decade. As in the case of Vilnius, the decreasing share of Russians can be mostly attributed to suburbanisation, though some changes in ethnic identity may also have occurred. In fact, the decline in the share of Russians is mostly caused not by a decrease in the number of Russians (or Poles in the case of the Vilnius suburbs), but by an increase in the number of Lithuanians in the suburban areas.

An increasing share of Lithuanians and a decreasing share of Russians are the main features of the Klaipėda MA (Table 6.1), which receives population predominantly from mono-ethnic western Lithuania. A decreasing share of Russians has been recorded in Klaipėda City, while, interestingly, the previously purely Lithuanian suburban zone of Klaipėda is becoming more mixed as the Russian minority is growing in size and share there (Figure 6.2, bottom row, right; the share of Russians is mapped). Although Russians accounted for only 9.1% of the total suburbanites in the Klaipėda MA (19.6% of the city's population were Russians in 2011), this had a fairly significant impact on the ethnic landscape in the suburban zone. Klaipėda's case demonstrates that there are differences between ethnic groups (Russians in this case) in terms of their

participation in the suburbanisation process and in migration behaviour in general. It may also imply that the social position of ethnic minorities varies in the different MAs in Lithuania.

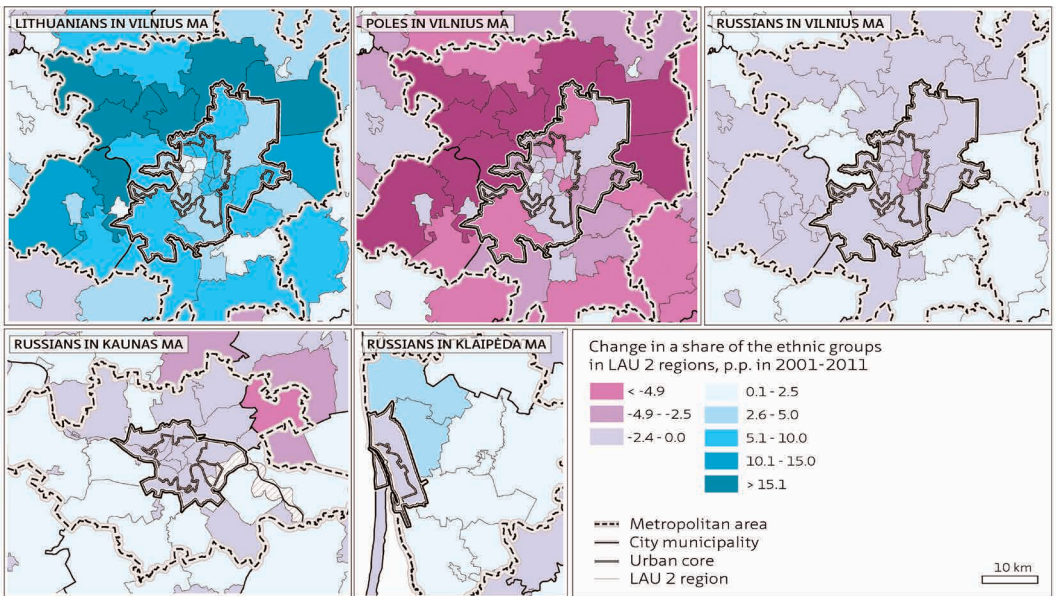

FIGURE 6.2 The change in ethnic composition in metropolitan areas on the LAU-2 level between 2001 and 2011 (percentage points)
Source: Authors' maps; Statistics Lithuania (2011)

Socio-ethnic segregation in the metropolitan areas

Before going into an analysis of socio-ethnic segregation, we should briefly introduce more general trends of socio-economic segregation in Lithuania. First, it has to be mentioned that in Lithuania the GINI index evaluating income inequality was among the highest in the European Union during the past decade (Eurostat, 2015), which leads us to expect higher levels of segregation in the country. On the other hand, a comparative study of European capital cities revealed that in 2011 the urban space of Vilnius was one of the most uniform in terms of socio-economic segregation (Tammaru, Marcińczak, et al., 2016). A deeper analysis of socio-economic segregation in Lithuania was carried out only for Vilnius city municipality (Marcińczak et al., 2015; Valatka et al., 2016). Our recent preliminary calculations show that compared to Vilnius City segregation is considerably lower and the measured indices (index of

segregation, dissimilarity and isolation) are smaller in Kaunas and Klaipėda cities. In 2011, the index of segregation of the high socio-economic status[33] group was 32 in the suburban zone of Vilnius, while it was below 30 in Kaunas and Klaipėda. The index of dissimilarity between managers and unskilled workers exceeded 40 in Vilnius, while it stood 10 points lower in other cities. The index of isolation, showing the degree of spatial separation (or actual spatial segregation), was typically the highest in the high status group (managers and professionals) in all the three cities, and this separation increased between 2001 and 2011. The general trend is that the bigger the city, the higher the index of isolation of the high status group in that city (Figure 6.3).

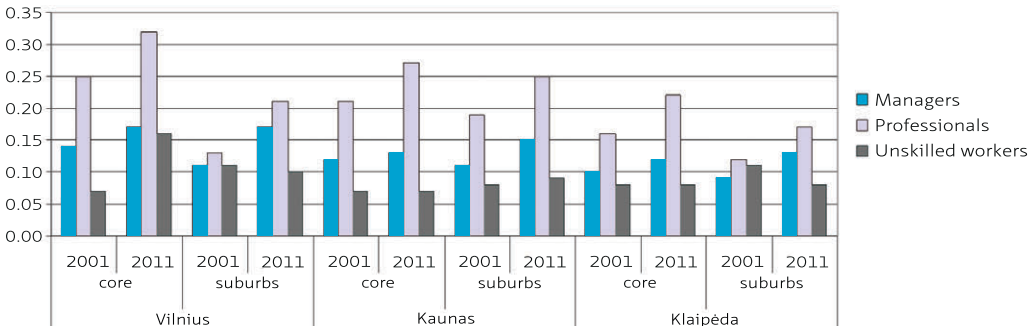

FIGURE 6.3 Index of isolation of occupational groups in metropolitan areas in 2001 and 2011 on the census-tract level
Source: Authors' figure; Statistics Lithuania (2001, 2011)

Income level is considered to be the best indicator of the spatial segregation or stratification of modern society. However, data on incomes are not always available; occupational groups (ISCO categories) are therefore often used as an alternative in research. Although the relationship between income level and occupational status is imperfect, general conclusions can be drawn. A national labour force survey showed that the gross earnings of managers were 3.4 times higher than those of unskilled workers in Lithuania in 2010 (Statistics Lithuania, 2015).

Even though the level of spatial segregation of occupational groups was quite low in Vilnius in 2011, recent studies have revealed that socio-spatial residential differentiation is increasing (Valatka et al., 2016). The highest social status groups are

33 Occupational status, according to the ISCO categories, is used as a proxy for socio-economic status, with managers and professionals representing groups with high socio-economic status, and unskilled and low-skilled workers those with low socio-economic status.

starting to live in increasingly greater separation from groups with the lowest social status, especially in suburbs and central locations. There is a clear major division between the relatively rich north and the poor (industrial) south of Vilnius City (the location quotients of the low occupational group are shown in Figure 6.4) and this division shows an increasing tendency. Poorer groups are being pushed out of the more prestigious locations in the city centre and from a suburban zone located in the north of the city.

The increasing population and changing ethnic composition of the MAs (above all, the rapid 'Lithuanisation' of the area surrounding Vilnius City) leads us to expect that there will be increasing social segregation, which, most importantly, has an ethnic dimension to it. It has been already confirmed that ethnic minorities participate less in suburbanisation and overall migration processes. This suggests that ethnic minorities may not have equal socio-economic positions in society because suburbanites often have a higher socio-economic status and, respectively, incomes. On the other hand, this might also indicate that different cultural (ethnic) groups have different locational priorities. A preliminary analysis of the occupational structure on the individual level showed that, in fact, ethnic groups are not equally represented among different occupational groups, especially in Vilnius City (Table 6.2). Differences in the second-tier cities of Kaunas and Klaipėda are not that clear and not always one-sided.

	VILNIUS		KAUNAS		KLAIPĖDA	
Ethnicity	High ISCO	Low ISCO	High ISCO	Low ISCO	High ISCO	Low ISCO
Lithuanian	54.9%	14.7%	41.5%	26.6%	35.3%	30.3%
Polish	25.0%	38.7%	42.9%	30.1%	33.9%	30.4%
Russian	34.3%	31.1%	31.8%	35.6%	26.4%	39.0%

TABLE 6.2 Percentage of employed population belonging to the highest and the lowest occupational groups in the major cities
Source: Statistics Lithuania (2011)

Different proportions of ethnic groups in the occupational structure indicate that there should be an ethnic dimension in the social stratification of urban societies. The links between ethnic groups and their socio-economic (occupational) status are uneven between different cities. The biggest differences were observed in the capital city, while the differences are considerably smaller in the second-tier cities. A comparison of Table 6.1 and Table 6.2 suggest that the larger the ethnic minority group in a city, the larger the share of its representatives who belong to a low status group. For instance, in multi-ethnic Vilnius City, Lithuanians have considerably better positions in the labour market than Poles and Russians, while there are no differences between the Polish and

Lithuanian groups in Kaunas and Klaipėda, where the Polish community is small. As well as other factors, this could be related to the specific labour market in the capital city, where there are many jobs in state administrative institutions that often require good knowledge of the Lithuanian language, which might be a problem for ethnic minorities that prefer to obtain an education in Russian- or Polish-language schools. It could also have to do with the historically established position of the Polish minority in more peripheral and rural parts of the Vilnius MA.

The numbers presented in Table 6.2 suggest that there might be a significant overlap between the distribution of the lowest status occupational group (represented by unskilled workers according to ISCO categories) and the Polish minority in Vilnius City. Figure 6.4 shows a very obvious overlap. The concentration of both unskilled workers (expressed by local quotients, which indicate the differences between the share of a particular group in a census tract relative to the city average) and the Polish minority was the highest in the southern industrial part of the city (along and behind the main railroad line) and in previous industrial or rural satellite settlements[34] in the northern parts. There is also an overlap between low-status occupational group and the Russian minority, but to less of a degree; it can be seen in Table 6.2 and Figure 6.4. These results suggest a strong socio-ethnic division in Vilnius City. We will explore it further in the next section by using individual-level data.

34 Rural settlements are in most cases towns with a few hundred residents that used to serve as centres of Soviet agriculture and/or local administrative units.

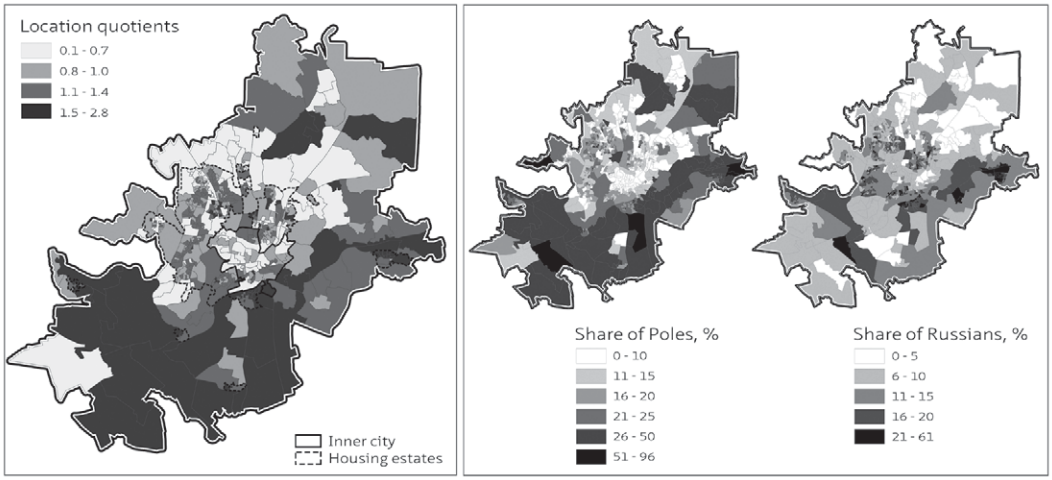

FIGURE 6.4 The concentration of the low-status occupational group (left) and Polish and Russian minorities (right) in Vilnius city municipality on the census-tract level in 2011
Source: Statistics Lithuania (2011)

The social dimension of ethnic differentiation in metropolitan areas

This section does not deal directly with the spatial patterns of the distribution of ethnic minorities. The primary task of this section is to verify the findings that suggest links between ethnicity and the socio-economic status of residents. These links logically mean that social segregation should also have an ethnic dimension. In this case, different social groups, as well as different ethnic groups, tend to live separately. On the other hand, we cannot state that ethnicity is a factor of segregation. It is more likely that ethnic segregation is a consequence of the different social status of ethnic groups. Analyses of the major Lithuanian MAs, where ethnic groups have different socio-economic positions, support this claim; we found a great spatial coincidence between occupational status and ethnicity.

The links between the distribution of ethnic and occupational groups, established in the previous section (Table 6.2 and Figure 6.4), indicate that ethnic groups occupy different social positions in the different MAs, with Vilnius being the most unique case. The situation in the second-tier cities is not as straightforward and socio-economic differences between different ethnic groups seem to be less evident. A series of logistic regression models were run to explore whether there are significant socio-economic differences between individuals belonging to different ethnic groups. In the models (not shown due to a large scale) we used the following set of dependent variables: high-ranking occupation, low-ranking occupation, and university education. Only residents

over the age of 18 were included in the analysis. Every model controlled for gender, age, and unemployment, which are theory-guided variables. All the results presented below have the highest significance levels ($p < .001$).

As we had expected, the results of the regression analysis showed that ethnic minorities are more likely to have weaker positions in the labour market than ethnic Lithuanians. This was particularly evident in the case of Vilnius. The reason may lie not in the exceptionally low-level positions of ethnic minorities, but in the exclusive positions held by Lithuanians in the capital city compared to the rest of the country. The capital city provides the best jobs and attracts the most prosperous population; unsurprisingly, around 45% of the income tax of Lithuania is collected in Vilnius, while its inhabitants make up less than 18% of the population (State Tax Inspectorate, 2014). Our results show that for Lithuanians the probability of having a high-ranking occupation in Vilnius City is 2.9 higher than for other ethnic groups, while this probability is only 1.5 times higher in the rest of the country. This probability is different for different ethnic groups and among the MAs. For example, compared to Lithuanians, the probability of having a high-ranking occupation is 2.5 times lower for Russians and even 3.6 times lower for Poles in the Vilnius MA. At the same time, ethnic minorities have relatively higher chances of having a high-ranking occupation in the Kaunas and Klaipėda MAs (e.g. Russians have a 1.6 times lower probability of having a high-ranking job than Lithuanians).

Ethnic minorities have fewer well-paid jobs in all the cities, but the differences are much smaller in the second-tier cities. Similarly, compared to Lithuanians, the probability of having a low-ranking occupation is higher for ethnic minorities, though the differences are considerably smaller. The probability of having a low-ranking occupation is 2 times higher for Russians and 2.9 times higher for Poles in the Vilnius MA but there are no substantial differences between ethnic groups in the other MAs. We can sum up that the only notably high ethnic disproportion is in the high-status job market, where Lithuanians are highly overrepresented. Lithuanians dominate among managers and high-skilled professionals in all the MAs and especially in Vilnius. Ethnic minorities are overrepresented among unskilled workers, though the degree of this disproportion is less visible in the second-tier cities.

We found that ethnic background also has an effect on the housing conditions of residents. There may be several reasons for this: different incomes, an inherited overrepresentation of Russians in Soviet housing estates (like in many post-Soviet cities in the Baltics), and the domination of Poles in the rural region surrounding Vilnius City, where single-family dwellings dominate. Differences are especially large in the multi-ethnic and most dynamically changing Vilnius MA. The case of Klaipėda once again illustrates the relatively better position of the Russian minority. The results

show that Lithuanians have a higher probability of living in post-Soviet housing (2.7 times higher in the Vilnius MA, 1.6 times in the Kaunas MA, and just 1.1 times in the Klaipėda MA), while Russians, compared to other ethnic groups, have a higher (3.1 times) probability of living in Soviet housing estates in Lithuania overall, which is similar to other post-Soviet states (Hess et al., 2012).

Although we did not attempt to explain the reasons for the established socio-ethnic segregation and socio-economic dimension of ethnic differentiation, some conclusions can be made based on our results. Alongside the ethnic dimension of occupational segregation, we also found that there are big differences between ethnic groups in terms of their education level. In general, the higher education levels of Lithuanians can be regarded as one of the reasons why they prevail among high-ranked professionals, especially in the Vilnius MA. Compared to Lithuanians, the probability to having a university education is 1.8 times lower for Russians and 3.7 times (!) lower for Poles in the Vilnius MA, while differences in the other MAs are minimal. The more disadvantaged positions of Poles in the Vilnius labour market may be related to their lower education levels. We cannot confirm but can only hypothesise that this situation is related to the weaker competitive power many ethnic minorities have in the competition for a university education (above all in the social sciences). Their skills in the Lithuanian language are poorer and this could be a barrier for those members of an ethnic minority living in one of the bigger cities who have the opportunity to receive their secondary education in their native language, which while it helps them to maintain a stronger cultural identity, may threaten their future careers. This hypothesis is partly confirmed by the following regression analysis, where occupational status and mother tongue, instead of ethnicity, are included (the following results have the highest significance levels, $p < .001$). In the Vilnius MA, the probability of having a high-ranking occupation for Polish residents whose mother tongue is Lithuanian is 2.3 times lower than that of ethnic Lithuanians (instead of 3.6 times lower in the case of the Polish minority as a whole). The probability of this group having a university education is 2.4 times lower than that of Lithuanians (instead of 3.7 in the case of the whole Polish minority). Similar results were obtained when the indicators of low-ranking occupation and education were calculated. Language skills are not the only factor that might explain the existing social differences. Other factors may have to do with historical development (the case of path dependency); for example, the traditionally dominant role of the Russian minority in an industrial sector, where a university education was not required, or the repatriation of the most educated and wealthy Poles after the Second World War.

The results described above were further verified and confirmed by correlation analysis. We used aggregated data on the census-tract level to explore the relationships between the share of a certain ethnic group and the share of people with a high-ranking

occupation. The results showed that the higher the proportion of ethnic minorities in a city, the stronger the relationship between the share of an ethnic group and its social status. In Vilnius, the share of Lithuanians has a strong and positive correlation with the share in a high-ranking occupation (r = .83, *p* = .000). Correlations with this variable are also strong for the share of Poles (r = -.73, *p* = .000) and Russians (r = -.56, *p* = .000), but they are negative. These results confirm the earlier calculations and the results obtained by cartographic analysis. The correlations are not evident in Kaunas (for Lithuanians r = .10, *p* = .019 and for Russians r = -.11, *p* = .014), while Klaipėda is in an intermediate position (for Lithuanians r = .33, *p* = .000 and for Russians r = -.35, *p* = .000).

To sum up, under such socio-ethnic stratification it is not a surprise to find ethnic segregation as well. As we can see, the situation can differ substantially in different areas, depending on a community's size and historical context. In most cases in Lithuania, especially in Vilnius, ethnic minorities are in disadvantaged socio-economic positions, and there is little chance that ethnic differentiation and segregation will decrease in the near future. Recently published data (Antanavičius, 2015) on the changes in housing prices in Vilnius districts during recent years support such expectations. Notwithstanding the general increase in housing prices in Vilnius, the prices of apartments in districts with a higher concentration of lower-income occupational groups and ethnic minorities (first of all, the southern part of Vilnius) actually decreased. Ethnic minorities with low income might be forced to further concentrate in these areas due to the lower prices. Thus, ethnic segregation, along with a more general social segregation, should continue to increase. The situation in the other two MAs will remain much more stable and in-migration should even reduce the existing concentration of ethnic minorities in some areas, unless more profound changes in international migration start to play a more serious role. Unfortunately, there is no reliable information concerning housing prices and their recent changes in Kaunas and Klaipėda, but we may expect that a low socio-ethnic division and lower housing prices will lead to a much smaller, or no, concentration of ethnic groups there.

The results of the above statistical analysis support our study of socio-ethnic segregation developed throughout this paper. Therefore, the statement that there is an ethnic dimension to social (socio-economic) segregation can be confirmed.

§ 6.5 Conclusion and discussion

In this paper, we explored socio-economic differences between the main ethnic groups and how these differences are spatially expressed in the Lithuanian MAs. Our results confirmed the hypothesis that social segregation had a strong ethnic dimension and that the strength of this relationship varied between the MAs. Cartographic analysis, regression models, and correlation analysis showed that there are clear links between ethnicity, social status, and spatial distribution, but the strength of the link varied between different MAs. The bigger the MA and the more numerous the ethnic minority, the less favourable the ethnic minority's socio-economic positions and housing conditions were compared to Lithuanians. The similarity of the results of analyses based on different methodological approaches validates our main findings and the suitability of the methods used to analyse segregation processes.

The ethnic landscapes in the MAs in Lithuania are considerably different compared to one another and to other post-Soviet or even Baltic cities. Therefore, we can state that there is no single type of post-Soviet city in the sense of place, status, and distribution patterns of ethnic minorities. However, ethnic minorities usually reside in less favourable locations in many metropolitan cities, notwithstanding the historical differences in the development of the ethnic landscape. Our findings are consistent with the trends observed in many European capital cities (Marcińczak et al., 2015; Tammaru, Marcińczak, et al., 2016). Growing social inequalities in the Vilnius MA result in growing spatial differences and the most affluent and mobile groups are becoming the most isolated ones. At the same time, ethnic minorities, on average, have lower social positions and remain concentrated in less attractive places created by the Soviet regime. Expanding wealthier groups are concentrated mostly in the suburbs. This situation is similar to the one observed in Tallinn (Tammaru, Kährik, et al., 2016), but differs from Riga, where the Russian population constitutes a strong majority and Soviet housing estates have a better image (Krišjāne et al., 2016). The growing social differences and resulting segregation of ethnic groups are making Vilnius more and more like other European capital cities (van Kempen & Özüekren, 1998), though the history of the development and initial socio-economic positions of ethnic minorities differ substantially. Socio-economic differences between ethnic groups are much smaller in the second-tier metropolitan areas of Lithuania. Therefore, growing social inequalities do not result in visible ethnic segregation. Ethnic spatial differentiation is diminishing within these MAs, suggesting that ethnicity itself does not have a tremendous impact on social positions and that certain structural factors (i.e. education and integration) may be much more important; the process of integration should be slower for numerically larger communities. The current socio-economic positions of the ethnic minorities analysed in Vilnius tend to reinforce socio-

ethnic segregation, especially in cheaper neighbourhoods with decreasing housing prices, where ethnic minorities are already highly overrepresented. This also means that the increasing spatial separation of these groups will serve to further decrease the integration process. The growing proportion of Russians found in the suburbs of Klaipėda also confirms that the dominant factors of spatial behaviour (when choosing a place of residence) are economic rather than cultural in nature. Although in this study we did not focus on the causes of ethnic segregation, our findings suggest that the reasons for the less favourable positions of ethnic minorities are not rooted in any discriminatory policies, since there are no essential regional differences in this field in different MAs.

We assume that the exceptionally strong link between ethnic and social segregation in the Vilnius MA appeared primarily as a result of its status of the capital city. Thus, it is likely that the reasons for segregation are related not to the exceptionally low positions of ethnic minorities here, but to the much higher position of Lithuanians. Vilnius attracts the most educated and richest residents from around the country, the absolute majority of whom are Lithuanians. This situation increases social inequalities not only between ethnic groups inside the MA, but also nationwide. Moreover, the existing spatial segregation in the Vilnius MA is also a result of the historical circumstances of the 20th century: the largest number of ethnic minorities was concentrated in Vilnius and its surrounding region (often in less favourable locations); industry, low-skilled services, and agriculture were the main job providers for ethnic minorities in the Soviet era, when the income difference between jobs was minimal. The current lower socio-economic positions, which ethnic minorities obtained after independence, reinforce this situation.

While ethnic residential differentiation is decreasing at the mezzo level (LAU 2 regions) even in Vilnius, neither the 'grand divide' between the south and the north nor divisions at the micro level appear to be on the decline. On the contrary, in many cases they are tending to grow and this means that ethnic groups are tending to live in greater isolation from each other. An increasing concentration of ethnic minorities with lower socio-economic status in the southern part of Vilnius City might lead to negative social effects for the whole MA in the near future. Neither social differences nor the spatial patterns of ethnic minorities are clearly manifest in the Kaunas and Klaipėda MAs. Moreover, inner migrations might reduce the existing patterns of low socio-ethnic differentiation in the near future.

The likelihood that the prevailing neo-liberal economic policies in the country will subside in the near future is limited. Therefore, a planning and construction policy should aim to create more attractive residential places in the southern part of Vilnius municipality and prevent the construction of low-quality and dense housing estates

in less attractive places. However, as there are no common administrative tools for planning and developing, such spatial units as a regional level of administration does not exist in Lithuania, rational and sustainable planning of all the three MAs comprising several municipalities is, unfortunately, not likely in the near future.

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7 Conclusions: Socio-spatial change in Lithuania. Depopulation and increasing spatial inequalities

§ 7.1 Introduction

Almost thirty years ago, Lithuania became independent from the communist Soviet regime. This resulted in large social, economic, demographic and political changes. In addition to the substantial benefits that were brought by the restoration of independence and the 'return to Europe' (Kornai, 2006), major macro-level changes also resulted in extreme population decline. The geopolitical and economic position of Lithuania completely changed: from a relatively affluent and prosperous region in the Soviet Union, it became a relatively poor country on the periphery of the European Union. In parallel, from the receiver of large inflows of immigrants from other Soviet Republics, it started to lose its population due to large-scale out-migration to Western European countries. Today, Lithuania has one of the fastest shrinking populations in the world. Since the 2000s, the average annual population decline has been -1.2 percent (Statistics Lithuania, 2017). As this thesis has shown, population decline, where the main factor is out-migration, has been accompanied by changing residential patterns and increasing socio-spatial inequalities throughout the country.

Until now, there has been very little academic research focusing on the processes and consequences of these socio-spatial developments in Lithuania. Moreover, the extent to which the existing literature properly captures the ongoing processes remains an open question. This thesis set out to fill the current knowledge gaps concerning the recent socio-spatial transformation processes and their consequences in Lithuania. The thesis aimed to contribute answers to the following questions:

- What are the main features and drivers of socio-spatial change in post-socialist Lithuania?
- Why, despite the growing economy and improvements in the standard of living, is Lithuania facing major challenges related to extreme population decline and increasing socio-spatial inequalities?

'Lithuania Disappearing', 'Lithuania does not stop its decline', 'The threat of emigration', 'The forecast is bleak' – such headlines have appeared on the front pages of the Lithuanian media almost daily in recent years. The focus of this thesis was not on the population decline *per se*, but on the social and spatial consequences that are related to this extreme decline. This thesis has highlighted some of the most problematic trends in socio-spatial development. Its main focus was on four interdependent areas of socio-spatial change: population decline, shifting residential patterns, processes of segregation and spatial inequalities. The emphasis was on the spatial dimensions of these processes. The thesis described the trajectories of the recent socio-spatial developments and examined why the scale and impact of the population change is exceptionally high in Lithuania. The thesis also showed how the Soviet-designed socio-spatial structures in Lithuania have adapted to the market economy environment. This study contributes to the existing literature by integrating the key processes of population decline, migration and segregation, which have been taking place in a rapidly changing post-socialist context. While the focus was on Lithuania, the results of this study will also be of value for other CEE countries, many of which have experienced similar trajectories of change during recent decades.

The dissertation included five empirical chapters, with each chapter presenting different aspects of socio-spatial change and addressing specific research questions. Chapters 2 and 3 focused on the country as a whole. These chapters analysed the geographical patterns of population decline and the role of selective migration on population redistribution and growing socio-spatial inequalities. Chapters 4, 5 and 6 focused on areas where the socio-spatial transformations have been the most intense – the metropolitan regions and, in particular, the Vilnius metropolitan region. These chapters contribute to the limited knowledge concerning the processes of ethnic and socioeconomic segregation in Lithuania. These are also the first studies analysing how the levels of segregation have changed over time in Lithuania.

The remainder of this concluding chapter is structured as follows. Firstly, the main findings of the five empirical chapters are summarised. Section 7.3 then presents an overall reflection and discussion of the research findings. In Section 7.4, the limitations of the thesis are discussed and, finally, Section 7.5 sketches some directions for further research.

§ 7.2 Empirical chapters

Chapter 2: Shrinking regions in a shrinking country: The geography of population decline in Lithuania 2001-2011

While in many countries research is focused on specific cities and regions (e.g. Bontje, 2005; Cortese, Haase, Grossmann, & Ticha, 2014; McDonald, 2014; Wolff & Wiechmann, 2017), little is known about the spatial dimension of population decline on a national level and the local factors determining spatially uneven population change. In this chapter, we examined the geography of population decline within Lithuania and how this decline is affected by a combination of regional characteristics.

In this chapter, we sought to understand why some regions are losing more population than others. We analysed the entire country at a low spatial level (*seniūnija*, corresponding to LAU 2 statistical regions) and investigated a broad set of local factors that potentially determined regional variations in population change, while other studies in Lithuania and elsewhere usually limit the analysis to particular aspects of decline (e.g. emigration) and analyse much larger spatial units. Our study used data from the 2001 and 2011 Lithuanian censuses, aggregated in small regions. We used linear regression to model population change in the regions, including a detailed urban-rural classification and a range of sociodemographic and economic characteristics.

We found great variations in population change across the country. The population decreased almost everywhere, except in the areas around the largest cities, where metropolitan growth is taking place, with some of these areas almost doubling in their population. The sharpest decline in population was in rural areas located further from the cities, many of which have lost close to half their residents between 2001 and 2011. Our results showed that an urban-rural distinction, city size and distance to cities are the most important factors in explaining regional variations in population change. In addition, these variations also depend on the percentage of working-age population, the percentage of high-ranking occupations, and the percentage of university-educated residents in the region. The regions where these percentages are small are shrinking the fastest. An interesting and unexpected finding was that the unemployment levels, as well as the levels of foreign investment, had no significant impact on population change. The results of this study give little hope to those who would like to develop policies to stop the decline outside metropolitan regions. It appears that the geographical location of the regions is a more important factor explaining population change than their demographic or socioeconomic composition.

Chapter 3: Population decline in Lithuania. Who lives in declining regions and who leaves?

Although many factors (natural population change, internal and out-migration) contribute to population decline and changing population composition, it has been shown that internal migration plays a major role in redistributing population and in growing spatial imbalance (Ambinakudige & Parisi, 2015; Ubarevičienė, 2016). Given a context of extreme population decline and increasing regional inequalities, little is still known about the direction of migration flow within Lithuania, as well as the demographic and socioeconomic composition of such flows. This study was the first to use individual-level geo-coded data from the 2001 and 2011 Lithuanian censuses to analyse internal migration.

The chapter focused on the rapidly declining regions in Lithuania, investigating the characteristics of those who live in these rapidly declining regions, and those who are most likely to leave such regions. Furthermore, the study examined to what extent the historic Soviet-designed settlement system has contributed to the current processes of population redistribution in Lithuania. The results of the regression models showed that low socioeconomic status residents and older residents dominate the population in the rapidly declining regions. Unsurprisingly, younger and single individuals with higher levels of education are the most likely to leave these regions. Among the latter, younger and higher educated individuals are more inclined to move into the metropolitan areas than to non-metropolitan areas. At the same time, however, the most socially disadvantaged groups are more likely to migrate between the rapidly declining regions. Therefore, these regions have been hit in two ways, losing young, educated people, and gaining older, lower educated and unemployed residents. As a result, socio-spatial polarisation continues to grow within the country, with younger people of higher socioeconomic status increasingly overrepresented in the metropolitan areas, and the elderly and residents with a lower socioeconomic status overrepresented in declining rural regions.

Our findings revealed that this double-edged form of selective migration leads to a downward spiral of decline, which becomes a cumulative and self-reinforcing process, leading to further population decline. Although uneven spatial development is typical of many countries, in Lithuania, it is accompanied by extreme rates of population decline. As a result, socio-spatial polarisation is more profound here than in many other countries. Moreover, other social consequences, such as segregation processes, can also be expected to be more profound in Lithuania.

Chapter 4: Ethno-political effects of suburbanisation in the Vilnius urban region: An analysis of voting behaviour

Using the example of the Vilnius urban region this chapter illustrated how recent socio-spatial change has been influenced by the historical and geographical context of Lithuania. Like many other formerly centrally planned cities in Europe, Vilnius is undergoing rapid suburbanisation, a process which started immediately after 1990 (Brade, Herfert, & Wiest, 2009; Cirtautas, 2013; Ubarevičienė, Burneika, & Kriaučiūnas, 2011). Suburbanisation became a significant driver of a change in ethnic composition in the surrounding Vilnius region (Burneika & Ubarevičienė, 2011). This was caused by the flow of ethnic Lithuanians from the city of Vilnius into its surrounding region, which had been dominated by Polish-identity residents. This chapter explored the confrontation of two ethnic groups in the suburbs by studying their voting behaviour.

Numerous studies have noted that ethnic minorities are less likely to vote than the majority population (Bullock & Hood, 2006; Crowley, 2001; Fennema & Tillie, 2001; Togeby, 1999; van Heelsum, 2005). However, if political parties representing the interests of ethnic minorities join the election process, this might mobilise ethnic minority voters to express their political views more actively in order to gain greater socio-political influence (Chandra & Wilkinson, 2008; George, Moser, & Papic, 2010; Wolfinger, 1965). In fact, the vast majority of Polish-identity residents in the region surrounding Vilnius city support the Polish political party, and this region also stands out for the exceptionally high voting turnout.

In this study, we used electoral data from the 1997 and 2011 municipality elections to gain insight into the ethno-political effects of suburbanisation in the Vilnius urban region. The election results showed that the region surrounding the city is dominated by those who vote for the Polish party. However, with the inflow of ethnic Lithuanians, the share of votes for this party is decreasing. At the same time, we observed a stark increase in the absolute number of votes for the Polish party in the zone of suburbanisation. We also found an increase in voter turnout, especially in areas with a higher proportion of Polish-identity residents in the population. These aggregate level findings suggest that Poles are concerned about their representation in the municipal government. We concluded that the Polish-identity residents show increased voter turnout in an attempt to protect their weakening position in local politics. The continuing process of suburbanisation thus appears to pose a threat to the Polish political party's dominant position in the future. Furthermore, the zones of the most intense change in voting behaviour identify areas of potential social tensions between ethnic groups.

Chapter 5: Large social inequalities and low levels of socioeconomic segregation in Vilnius

In Chapter 5, we took a closer look at the socioeconomic segregation processes in Vilnius, the capital city of Lithuania, covering two waves of population census in 2001 and 2011. This chapter is a part of a larger comparative study, as reported in a book on socioeconomic segregation in European capital cities (Tammaru, Marcinczak, van Ham, & Musterd, 2016). It is noteworthy that the overall results of the study revealed increasing levels of segregation in all cities except Amsterdam. This is associated with dominant neo-liberal politics and globalisation and therefore increasing social inequalities. The study showed that Vilnius is one of the least segregated European capital cities, while, according to the Gini index, the income gap in Lithuania has constantly been among the highest in the European Union in recent decades (Eurostat, 2017). This contrast attracts special attention to Vilnius.

As an indicator of socioeconomic status, we used the International Standard Classification of Occupations (ISCO) and analysed how the spatial patterns and levels of socioeconomic segregation have changed over time in Vilnius. Several measures of segregation were used to illustrate different trends. The index of segregation, which indicates how evenly occupational groups are distributed across the city, showed a low and stable level of segregation, with a minor trend towards growing inequality in the distribution of the middle and lower occupational groups. The index of dissimilarity, which compares a distribution of two selected groups, showed an increase of spatial distance between lower and higher occupational groups. This trend was further confirmed by the index of isolation, which demonstrated sharply increasing isolation of the higher occupational groups, but decreasing isolation of the other groups. We concluded that this was a result of the residential mobility of more affluent households, which concentrate in the most attractive inner and outer city locations. These findings were further supported by the location quotient maps, which showed the concentration of higher occupational groups in the inner city and the suburban zone.

Our results showed that the historical divide between the relatively rich north and the poor south of the city is deepening. Socioeconomic segregation in Vilnius occurs when market forces work in conjunction with the weak welfare state and there is a limited supply of high-quality housing. The Soviet-era housing estates have become stagnant and are unattractive to younger or more affluent people. The findings of our research imply that the main factors associated with socio-spatial change in Vilnius are related to an exceptionally high share of housing estates (accommodating 70 percent of the Vilnius population) and the polycentric urban system of Lithuania. Furthermore, the concurrent distribution of ethnic minorities allows us to speculate on the ethnic dimension of socioeconomic segregation (further investigated in Chapter 6).

Chapter 6: Socio-ethnic segregation in the metropolitan areas of Lithuania

Ethnic and socioeconomic segregation are strongly linked in most cities (e.g. Clark & Blue, 2004; Tammaru, Kährik, Mägi, Novák, & Leetmaa, 2016). While most social segregation studies focus on capital cities, much less is known about second-tier cities. This final empirical chapter examined the interrelationships between ethnic and socioeconomic segregation in three metropolitan areas of Lithuania, formed by the cities of Vilnius, Kaunas and Klaipėda. The ethnic landscapes in these metropolitan areas are considerably different to each other and this makes their comparison interesting. These are the only macro-regional centres that still have the potential to retain population in the rapidly shrinking country. They are also the main destination points of internal migration in Lithuania. Moreover, their occupational structure has experienced a major shift during the last decades, with a sharp increase in high-status occupational groups. Therefore, we were interested in the effect of these changes on the patterns of socio-ethnic segregation in the metropolitan areas.

This study used individual-level and census-tract level data from the 2001 and 2011 Lithuanian censuses. It investigated whether different ethnic groups (Lithuanians, Poles and Russians) might be associated with different socioeconomic statuses and how this relationship may have changed over ten years. The results revealed a clear relationship between the socioeconomic and ethnic status of the residents of metropolitan areas and, therefore, suggest that ethnic segregation is strongly linked to the general processes of socioeconomic segregation. The findings showed that the higher the proportion of a certain ethnic minority group in a neighbourhood, the higher the proportion of lower socioeconomic status residents in this group. In addition, ethnic minorities often tend to concentrate in less attractive neighbourhoods. The strength of the relationship between socioeconomic and ethnic status varied between the metropolitan areas. In Vilnius, increasing socioeconomic segregation had a clear ethnic element. In contrast, socio-ethnic segregation is slowly diminishing in the second-tier cities. Although socioeconomic inequalities are increasing in the latter, they were not associated with the ethnic dimension.

While the levels of ethnic and socioeconomic segregation are low in Lithuania in comparison to many other European cities, the increasing segregation is noticeable. It is especially evident in the multi-ethnic and most dynamically changing Vilnius metropolitan area, with ethnic minorities found in increasingly disadvantaged socioeconomic positions. The current trends are likely to continue, and there is thus a high degree of certainty that poverty concentration will occur in the near future. Moreover, increasing segregation is associated with social tension. As Chapter 4 illustrated, it is suburbanisation that is leading to changes in ethnic composition and this is resulting in ethno-political tensions between the residents in the surrounding Vilnius region.

§ 7.3 Reflection on the research findings

The framework of the thesis concerned three realms of macro-level change in Lithuanian society: political and economic system change; urban and regional planning policy change; and economic restructuring. These three realms of macro-level change as well as social-spatial changes that they trigger (population decline, shifting residential patterns, social segregation and regional inequalities) were relevant to each of the empirical chapters and their political, economic and spatial planning contexts (Figure 7.1). After summarising the main results of the empirical chapters, this section will analyse the meaning and significance of the main research findings in a broader context.

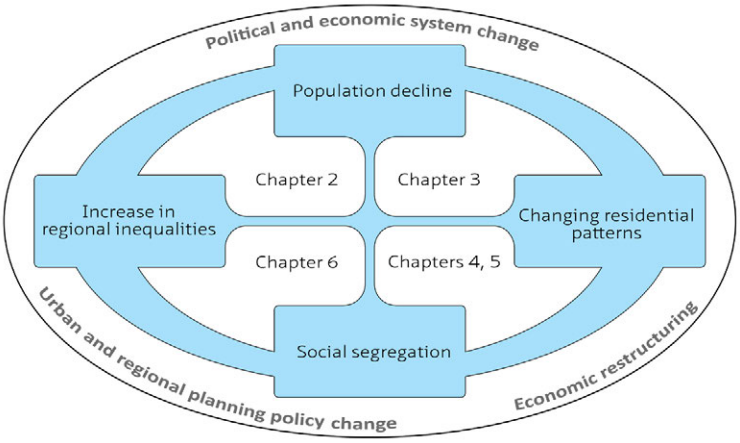

FIGURE 7.1 Structural overview of the thesis

In addition to the different structural layers of analysis illustrated in Figure 7.1, the empirical chapters focused on different spatial scales. Thus, spatial scale was another organising principle of this thesis. Population decline and migration were studied within the country as a whole (Chapters 2 and 3), suburbanisation was studied at the city-region level (Chapter 4) and segregation was studied at the level of neighbourhoods (Chapters 5 and 6). Processes analysed on the various scales illustrated the various effects of socio-spatial change on different spaces and groups in society. An important general finding is that each chapter demonstrated increasing socio-spatial inequalities in Lithuania, regardless of the scale of the analysis.

In Lithuania (Cirtautas, 2013; Krupickaitė, 2003; Vanagas, Krišjane, Noorkoiv, & Staniūnas, 2002), as in other CEE countries (Borén & Gentile, 2007; Lang, Henn, Sgibnev, & Ehrlich, 2015; Schmidt, Fina, & Siedentop, 2015), there is a strong trend towards metropolisation and peripheralisation. However, in Lithuania, increasing spatial inequalities are accompanied by extreme rates of population decline and, therefore, the socio-spatial consequences are more profound compared to many other countries. This can be illustrated by the following example. Three decades ago the network of public amenities was designed for a population of 4 million people and it was fairly evenly distributed across the country. The current population, however, is below 3 million and increasingly concentrated in the largest cities, especially in Vilnius. This process not only involves the spatial redistribution of population, but also significant changes in the composition of the population, in both the population 'winning' and population 'losing' regions. Both types of regions are faced with major challenges and their residents are experiencing adverse, although different, consequences. For example, many schools are being closed in rural areas throughout Lithuania, while there is a shortage of day care services and kindergartens in Vilnius, especially in the suburbs. The residents in the declining regions are also challenged by a decreasing supply of the most basic services, such as grocery stores, post offices, banks and medical services. At the same time, a concentration of population and economic activity is resulting in rising costs of living and increasing real estate prices in the metropolitan regions, especially in Vilnius.

Thus, it is evident that socio-spatially unbalanced development in Lithuania requires significant policy interventions. It is important to ensure that standards of living are sufficiently high and affordable for all residents of the country. However, to date, there is no effective policy response to address the challenges related to increasing regional inequalities in Lithuania. The question thus arises: Is population decline and its consequences being ignored, or do policymakers simply not know how to cope with decline?

The empirical research presented in this thesis confirmed the theoretical proposition that recent socio-spatial developments in Lithuania are still to a large extent determined by the legacy of Soviet planning policies, particularly those related to decentralised development strategies. Therefore, the current trend towards centralisation can be interpreted as an ongoing adaptation of a Soviet-constructed socio-spatial structure to one that is better suited to a capitalist system and a market-led economy. This explains why population decline in Lithuania is tightly linked to changing residential patterns, leading to increasing spatial inequalities. This process is occurring hand in hand with economic restructuring, being both the reason and the consequence of population decline and increasing inequalities.

The results of this thesis suggest there is little hope that current trends in socio-spatial development will soon be set in reverse. The empirical chapters revealed some of the most problematic trends in this socio-spatial development. The results are in accordance with existing theories of regional economic divergence (Capello, 2009; Dawkins, 2003). For example, in line with cumulative causation theory, in Lithuania, many peripheral regions are facing a downward spiral of decline, which has become a cumulative and self-reinforcing process leading to further population decline (Hudson, 2015; Myrdal, 1957). Metropolisation processes in Lithuania, in contrast, can to a large extent be explained by growth poles theory (Perroux, 1955) and agglomeration economies (Puga, 2010; Quigley, 2013).

Our results showed that the most rapidly declining areas are being hit in two ways, as they are both losing young educated people and increasingly accommodating older, lower educated and unemployed newcomers. In the context of extreme depopulation, the metropolitan regions are facing different challenges. They are the only areas that still have the potential to grow, although a decline in the population is evident in the cities' central areas. In this thesis, particular attention was paid to the processes of socioeconomic and ethnic segregation in the metropolitan regions. In Vilnius, increasing socioeconomic segregation has a clear ethnic dimension. It is likely that the current trends will continue, leading to further segregation between the affluent and the poor within the Vilnius metropolitan region. In addition, an example of the resulting ethno-political tensions in the surrounding Vilnius region was analysed in Chapter 4. The continuing processes of suburbanisation, gentrification and professionalisation of the workforce lead us to expect that levels of segregation will continue to increase. Certain policies should be implemented in order to ensure social stability and prevent poverty concentration in the future.

Emigration, which is the main reason for population decline, requires additional attention. Reflecting on the results of this thesis, we can state that high levels of emigration can partly be explained by the Soviet-constructed polycentric urban system and its continuing impact on the urban geography of Lithuania. Such an urban system has resulted in relatively weak social relations between the capital city and the rest of the country. Today, with the trend towards centralisation well underway and people facing the necessity to leave shrinking regions, migration to the capital city or abroad have become equally likely alternatives. For many, emigration to the west of Europe has become a more attractive solution than staying in Lithuania.

Since 2004, when Lithuania joined the EU, the main destination for migration has been Western European countries; in particular, the UK, Ireland, Germany and Norway. Many Lithuanians now have friends and relatives in these countries and, thus, for many, it is becoming easier and easier to make a decision to follow this path. In other

words, an increasingly important role in migration decisions is being played by social networks (explained by social capital theory, see e.g. Coleman, 1990). Although many Lithuanians who live abroad still have links with their homeland, these links are becoming weaker over time. At the same time, their social networks are expanding abroad. Under such circumstances, it is difficult to expect that many emigrants will return.

Emigration has thus very high inertia and is 'out of control' in Lithuania. Migration has become a behaviour of the masses, perhaps even fashionable. Furthermore, emigration has significantly distorted the age structure of the population in Lithuania. Since those who emigrate are mostly young people, emigration also has a significant effect on fertility rates, which are falling (Civinskas, Genys, Kuzmickaitė, & Tretjakova, 2011). As a result, population decline in Lithuania is being followed by an aging of the population. While, until now, the negative impact of population decline and aging has been minimal on the economy, this situation is very likely to change in the near future. A shortage of labour has already started to manifest itself in some sectors of the economy.

Although awareness of adverse socio-spatial development is increasing in both the public and political domains, there are no well-developed plans or strategies to adapt to population decline and increasing socio-spatial inequalities. Most regional planning in Lithuania is still growth oriented. Local politicians and planners do not seem to accept that population decline might be an unavoidable process. It is likely that a relatively stable labour market and overall economic growth are used as an excuse by the government to not take any steps to manage the structural process of demographic change and spatially unbalanced development, leading to increasing regional and social inequalities.

At least some of the existing problems in Lithuania could be solved by means of more effective regional planning. The results of this PhD thesis suggest that more planning is needed on all levels: the country, regions and neighbourhoods. Spatial planning policies – which are currently lacking – could play a major role in dealing with population decline and increasing socio-spatial inequalities. In contrast to popular belief, this thesis argues that population shrinkage is inevitable in Lithuania. It is very difficult to reverse this process and to prevent further out-migration. The challenge lies in maintaining a good balance between the needs of the residents and the financial capacity of the state. In each case, it might make most sense to plan for further population concentration in Lithuanian cities. In declining areas, the most efficient strategy would be to accept decline and concentrate services in accessible regional centres. Greater involvement of communities and citizen participation could also contribute to better living conditions for all. Since residents know their daily

environment and its shortcomings best, this local knowledge could be better exploited and shared with policymakers. The engagement of local communities in decision-making, problem-solving processes or simply in maintaining the environment can lead to a greater resident's place attachment, trust, more social cohesion and better quality of life.

§ 7.4 Limitations of this thesis

Data-related challenges

In this thesis, the emphasis was on the spatial dimension of post-socialist transformation. Until recently, it was a major challenge to do socio-spatial research on Lithuania, due to very limited data availability. When this PhD project started, it was only possible to use cross-sectional data aggregated on municipality level (~50 000 residents in 2011) or LAU 2 regions (~2500 residents in rural areas and 20 000 residents in urban areas in 2011). As this thesis progressed, access was obtained to more detailed census-tract level data (~600 residents in 2011) and, eventually, after a year of lobbying with the help of international support, to individual-level geo-coded Lithuanian census data. This access to individual-level data is one of the major achievements of this PhD project. This thesis is the first to use individual-level geo-coded Lithuanian census data for the whole population.

Although it is the most reliable source of data, census data typically has some shortcomings. These shortcomings limited the scope of the thesis to some extent. Most of the data limitations were encountered in the study on migration (Chapter 3). They can be summarised as follows:

- *Geography.* Although each chapter of this thesis was focused on the smallest possible geographical scale, ideally this scale could have been more detailed. Some important spatial (geographical) information is lacking in relation to mobility studies. Census data in Lithuania does not provide information on intra-urban or intra-rural migration; only those moves involving the crossing of a boundary of a city municipality or ward (LAU 2 region) are recorded.
- *Time-varying characteristics.* Information on individual characteristics is only available for the census date. When we analyse migration behaviour of individuals, we only know their characteristics after they have moved but not before. Therefore, the effects of

time-varying variables such as education, occupation and household status should be interpreted with caution.

- *Motives for migration.* Census data does not contain information on the reasons or motives for migration within the country (although the reasons for international migration are provided). In our study (Chapter 3), we could only interpret migration motives based on contextual characteristics, such as levels of unemployment or labour-market structure in the region. However, personal motives related to education, career development or partnership are no less important than the regional push/pull factors.
- *Income data.* Income level is considered to be the best indicator of social segregation. However, income data was not available at a low geographical or individual level in Lithuania. Occupational data were therefore used as a proxy for socioeconomic status, although the relationship between income level and occupational status is imperfect in Lithuania.
- *Longitudinal overview.* The data for the 2001 and 2011 censuses are currently not linked at the individual level in Lithuania. Therefore, we cannot follow people over time and investigate how their lives change after they move. Ideally, one would have access to longitudinal geo-coded individual-level data to study patterns of socio-spatial change.
- *Census-linked data.* In addition to a longitudinal perspective, more research possibilities would open up if census data could be linked with other registered data, the latter containing mortality and birth records, as well as more precise data on residence and movement. This would be a major addition to the study in Chapter 2, as it would allow us to distinguish between population decline caused by migration and that due to natural changes. Although it has already been demonstrated (Klüsener, Stankūnienė, Grigoriev, & Jasilionis, 2015) that such data linkage is possible in Lithuania, this currently requires quite substantial additional resources.

Data limitations did not allow us to explore more specific research questions that can be addressed in countries with much more developed, advanced and open databases (e.g. the Netherlands, Sweden, Finland and the United Kingdom). As a result, we had fewer opportunities to develop innovative methodologies or theories which need to be tested using, for example, extensive longitudinal databases. This is a limitation not only in Lithuania, but in the wider region encompassing the post-socialist CEE countries. Indeed, researchers studying CEE countries have been accused of not being innovative or contributing to theory formation (Jauhiainen, 2009; Wiest, 2012). This is at least to a large extent related to data limitations.

However, the fact that the statistical database infrastructure is relatively poor in CEE countries can also be turned into some benefits. For example, many aspects of these rapidly changing societies are still unexplored, and thus the demand for research is expected to grow. There is an evident division between East and West Europe in terms

of population decline, wage levels, pensions and social spending (Aidukaitė, 2011; Eurostat, 2017). More balanced spatial and economic development, as well as the prevention of social exclusion, are important goals for the EU. Thus, a good knowledge of various societal and spatial processes is important when addressing issues related to better EU integration.

Vision for the future – 'data dream'

A major challenge for the future will be to overcome the data limitations presented above. This thesis found that internal migration is leading to increasing spatial inequalities and residential differentiation throughout Lithuania. To gain more insight into the underlying mechanisms, the priority must be to obtain longitudinal geo-coded data for Lithuania. Such data will allow us to address more specific research questions, especially those related to residential mobility, thus enabling the investigation of the mobility trajectories of people. Longitudinal data would allow us to examine the formation mechanisms and patterns of residential differentiation in much more detail. In addition, the census questionnaire should be complemented with information on intra-urban mobility. Such an improvement would give us more insight into the processes of segregation within the cities. Another challenge would be to link census and register-based data. The fulfilment of such a 'data dream' would lead to new and better knowledge that could be used for (spatial) policy formation, aiming to reduce the negative social and economic consequences of population decline and spatially unbalanced territorial development. In order to achieve this, the first step should be a strengthening of communication between researchers and policymakers. This 'data dream' must become a mutual concern of both researchers and policymakers.

§ 7.5 Directions for further research

This thesis contributed to the expansion of a previously very limited knowledge about the socio-spatial developments taking place in Lithuania. The thesis highlighted the most problematic trends and enhanced our understanding of some of the more general processes. On this basis, this final section will sketch some directions for further research.

The results of this thesis showed that it is important to put more emphasis on socio-spatially unbalanced development of Lithuania. Socio-spatial inequalities are widening

on different spatial scales: in the country as a whole, between and within the regions, and between and within cities. The processes of residential differentiation and segregation and their effects on different spaces and groups in society need further investigation. It is important to gain more knowledge of these processes in order to implement spatial planning policies that aim at reducing the adverse consequences of population decline and spatially unbalanced territorial development.

More attention needs to be paid to both the declining regions and the metropolitan areas. There is increasing concern about the erosion of human and economic resources in the declining regions. Population decline is being followed by a decline in service provision and employment opportunities and thus worsening conditions for people who remain in these regions. Of the country's area, 41 percent has lost more than 20 percent of the population between 2001 and 2011, and it is a major challenge to ensure the standard of living in these regions remains sufficiently high, but at the same time affordable. Further (qualitative) research should be directed to these areas to investigate the living conditions and needs of the residents. Although the results of this thesis have already provided insights into selective migration, questions such as why people move to declining areas and who they are need further research. At the same time, metropolitan areas are faced with different challenges – high levels of social inequality and increasing levels of segregation. Although our results show that the current levels of segregation are relatively low, there is a serious risk of segregation increasing in the near future, especially in Vilnius. Further research and policy interventions are needed to prevent increasing social tensions.

Finally, comparative international studies should focus on the Baltic States, which share a similar historical and geographical context. Greater cooperation between the Baltic States in creating regional policies, in particular those related to their shrinking cities and regions, is anticipated. Moreover, it can be expected that extreme population decline in Lithuania should trigger international interest in the country. It is rather phenomenal that while the economy of the country is steadily growing and the standard of living is improving, the population is declining and this trend seems to be accelerating. Due to the unusual scale of the socio-spatial change taking place in Lithuania, research in this country could benefit knowledge and expertise on population shrinkage in other regions and countries.

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Curriculum Vitae

Rūta Ubarevičienė (1989) was born and raised in the city of Panevėžys, Lithuania. In 2005 she finished the J. Balčikonis gymnasium and started her Bachelor studies at Vilnius University under the Geography programme, followed by a Master degree within the programme of Geography and Landscape studies at the same university. She graduated in 2011 with a master thesis on post-soviet economic transformations, which was awarded with the highest grade. In 2009 Rūta started her academic career in the Nature Research Centre and from 2012 she is working in the Lithuanian Social Research Centre, Institute of Human Geography and Demography. She has participated in multiple research projects and co-authored many papers, book chapters and reports on socio-spatial change, population decline, segregation and migration in Lithuania. In 2012 Rūta received a grant from the EU Lifelong Learning Programme to do research at the Faculty of Architecture and the Built Environment, Department OTB at Delft University of Technology in the Netherlands. This research stay resulted in plans to write a PhD thesis in Delft on socio-spatial change in Lithuania, which was formalised in February 2016. At the same time Rūta continued working in the Lithuanian Social Research Centre. In 2016 Rūta spent six months as a visiting researcher at the Leibniz Institute for Regional Geography, Leipzig, Germany, where she collaborated in the international comparative research project 'Urban reconfigurations in post-Soviet space'. Rūta's academic achievements have been recognized multiple times by the Research Council of Lithuania in the form of personal grants and scholarships.

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During the last three decades Lithuania's geopolitical and economic position has radically shifted from being a relatively affluent and prosperous region in the Soviet Union to a relatively poor country on the periphery of the European Union. In parallel, Lithuania's position as a net recipient of large inflows of immigrants from other Soviet Republics has dramatically changed. Lithuania has lost a large proportion of its population over the last decade, mainly due to out-migration to Western European countries.

Today Lithuania has one of the fastest shrinking populations in the world. This population decline has resulted in rapidly increasing socio-spatial inequalities. For example, there has been a concentration of population and wealth in metropolitan regions and a simultaneous decline in many peripheral rural regions. Within Lithuanian cities social segregation has increased. This PhD thesis investigates the complexity, pace and scale of post-socialist socio-spatial transformations in Lithuania and their consequences for well-being.

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