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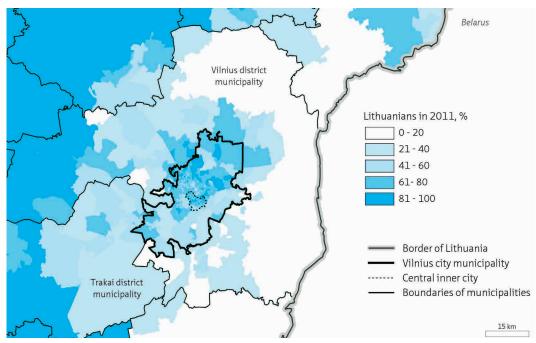
FIGURE 5.1 Ethnic fragmentation of the Vilnius urban region
Source: Census 2011, Statistics Lithuania, authors' map

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).
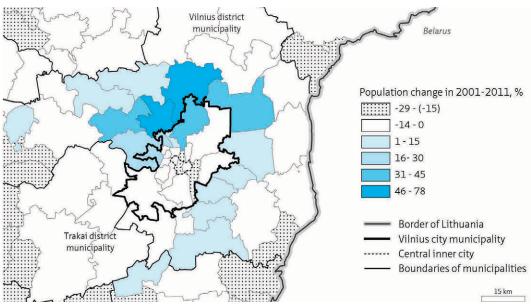

FIGURE 5.2 Population change in the Vilnius urban region, 2001-2011
Source: Census 2001, 2011, Statistics Lithuania, authors' map

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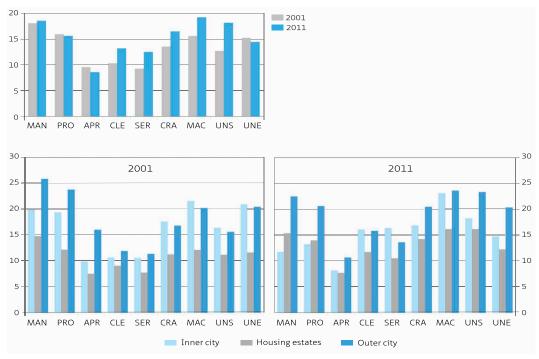
FIGURE 5.4 Indices of segregation
Source: Census 2001, 2011, Statistics Lithuania, authors' graph

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).
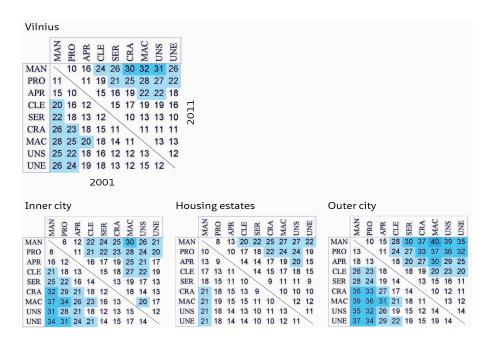
Vilnius

	MAN	PRO	APR	CLE	SER	CRA	MAC	UNS	UNE
MAN		10	16	24	26	30	32	31	26
PRO	11		11	19	21	25	28	27	22
APR	15	10		15	16	19	22	22	18
CLE	20	16	12		15	17	19	19	16
SER	22	18	13	12		10	13	13	10
CRA	26	23	18	15	11		11	11	11
MAC	28	25	20	18	14	11		13	13
UNS	25	22	18	16	12	12	13		12
UNE	26	24	19	18	13	12	15	12	

2011 (upper right) — 2001 (lower left)

Inner city

	MAN	PRO	APR	CLE	SER	CRA	MAC	UNS	UNE
MAN		6	12	22	24	25	30	26	21
PRO	8		11	21	22	23	28	24	20
APR	16	12		16	17	19	25	21	17
CLE	21	18	13		15	18	27	22	19
SER	25	22	16	14		13	19	17	13
CRA	32	29	21	18	12		18	14	13
MAC	37	34	26	23	16	13		20	17
UNS	31	28	21	18	12	13	15		12
UNE	34	31	24	21	14	15	17	14	

Housing estates

	MAN	PRO	APR	CLE	SER	CRA	MAC	UNS	UNE
MAN		8	13	20	22	25	27	27	22
PRO	10		10	17	18	22	24	24	19
APR	13	9		14	14	17	19	20	15
CLE	17	13	11		14	15	17	18	15
SER	18	15	11	10		9	11	11	9
CRA	21	18	15	13	9		10	10	10
MAC	21	19	15	15	11	10		12	12
UNS	21	18	14	13	10	11	13		11
UNE	21	18	14	14	10	10	12	11	

Outer city

	MAN	PRO	APR	CLE	SER	CRA	MAC	UNS	UNE
MAN		10	15	28	30	37	40	39	35
PRO	13		11	24	27	33	37	36	32
APR	18	13		18	20	27	30	29	25
CLE	26	23	18		18	19	20	23	20
SER	28	24	19	14		13	15	16	11
CRA	36	33	27	17	14		10	12	11
MAC	39	36	31	21	18	11		13	12
UNS	35	32	26	19	15	12	14		14
UNE	37	34	29	22	19	15	19	14	

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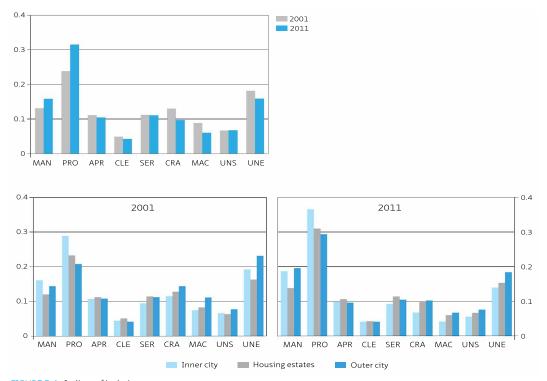
FIGURE 5.6   Indices of isolation
Source: Census 2001, 2011, Statistics Lithuania, authors' figures

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.
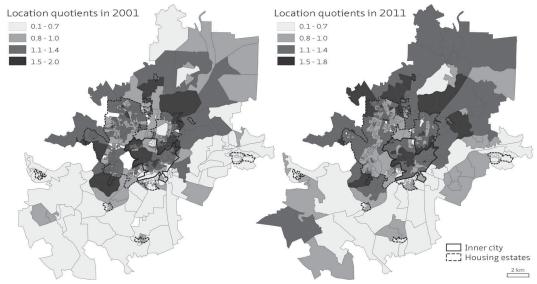
Location quotients in 2001
- 0.1 - 0.7
- 0.8 - 1.0
- 1.1 - 1.4
- 1.5 - 2.0

Location quotients in 2011
- 0.1 - 0.7
- 0.8 - 1.0
- 1.1 - 1.4
- 1.5 - 1.8

Inner city
Housing estates

2 km

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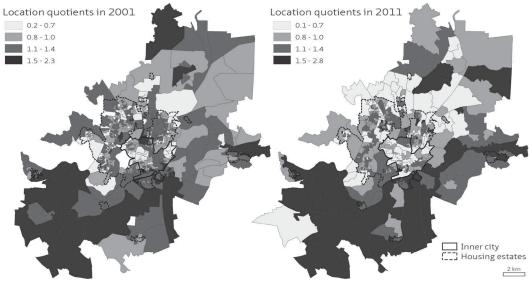
FIGURE 5.8 Location quotient maps for the unskilled workers
Source: Census 2001, 2011, Statistics Lithuania, authors' maps.

§ 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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