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**National Minorities and Regional
Development: A Comparative
Overview of the Three Baltic States.**

Craig Willis

ECMI WORKING PAPER #117

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NATIONAL MINORITIES AND REGIONAL DEVELOPMENT: A COMPARATIVE OVERVIEW OF THE THREE BALTIC STATES.

This Working Paper is a mapping exercise of the minority communities in the three Baltic states of Estonia, Latvia and Lithuania, with regard to the regional development within the countries. Using census data combined with a series of regional development indicators from Eurostat and OECD Regional Well-Being, an overview of each of the countries' regions at the NUTS Level 3 is provided, as well as a comparison across all three. This research finds, through a series of bivariate regression analyses, that within and across all three countries, there is no statistical linear relationship between the percentage of minority population in a region and multiple indicators of regional development – including GDP. Rather, the main dividing line is between capital city regions and the rest of the country/s. Yet, in peripheral regions, the regional development indicators show that regions with a large minority population are not necessarily any worse off than other peripheral regions which have a low minority population – particularly the case in Lithuania. This offers some evidence that a large minority population is not a hindrance to a region's development. Nonetheless, the research provides an overview of the challenges in which many regions home to a large percentage of minorities possess, particularly in the areas with a high ethnically Russian population percentage. Thus, this Working Paper concludes by identifying patterns and outliers of regions in order for intensified and comparative further case study research at the micro level.

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1. Introduction

Despite significant progress since independence and entry into the EU over the past two decades, the Baltic states of Estonia, Latvia and Lithuania continue to perform below EU average in many indices and all three countries have internal inequality issues along varying lines. Alongside this, again despite much progress particularly in the run-up to joining the EU, all three countries still have issues relating to the situation of minorities – as can be seen in the Opinions of the Advisory Committee on the Framework Convention for the Protection of



National Minorities (ACFC).¹ Given that minorities often live in underdeveloped areas, there seems to be a logical overlap to examine the situation regarding the development of such regions and how this affects or can be affected by, minority communities. Indeed, more broadly, the role of minorities in regional development remains an under-developed area in academia, particularly with regard to macro-level data. This Working Paper aims to contribute to a new research agenda at the European Centre for Minority Issues (ECMI) as well as adding to the existing literature on national minorities in Europe and building on past ECMI research on the Baltic States.

An overview of the background situation of the area is first provided, outlining justifications for why a comparative approach is useful in terms of similarities and differences of the three Baltic states. This is followed by an in-depth methodology which explains the use of the Nomenclature of Territorial Units for Statistics (NUTS) subdivisions as well-defined and measurable regions, as well as the use of Eurostat and OECD Regional Well-Being statistics in order to measure regional development. Section 4 of the Working Paper then analyses each country through scatterplots depicting regions by minority population and each indicator of regional development, followed by section 5 which does this in a cross-country comparative sense. Throughout these two sections, the Working Paper aims to search for potential linear relationships (and statistically test these through a series of bivariate regression analysis), as well as identifying patterns and outliers for future case study selection at the micro level. Thus, this Working Paper should be primarily viewed as mapping exercise intending to increase the background knowledge of the regional variations of development in Estonia, Latvia and Lithuania, matched against the minority population sizes. As a conclusion, the reader will be able to utilise this research to view data on the situation surrounding minority populations in different subdivisions of each country.

An initial note on terminologies; the Working Paper uses the term minority to mean an ethnic group other than the numerical majority ethnicity in each state (Estonian in Estonia, etc.), as defined by each states' census data. It can be the case that in certain regions an ethnic minority may indeed be the majority for that region, nonetheless the terminology continues to refer to them as a minority based on the country level.

2. Background Situation and Literature

Regional development has been traditionally measured through economic indicators and much of the macro level data remains in this vein. Thus, this is undertaken by using statistical indicators such as GDP, un/employment rates. Although there has been a shift to include non-economic factors such as social capital and cultural dimensions², the role of minorities in these processes remains under researched. The eventual aim is indeed to ascertain what role minorities play in regional development; however, it is first necessary to improve the knowledge of the areas in which minorities reside. In this instance, if one wants to know what role minorities play in the Baltic countries, it is useful to know whether they are contributing to a positive position of a region (in comparison to others – both within and across the Baltics), or what specific challenges they face in doing so – for example comparatively high unemployment . Thus, it should be seen as painting a picture for consequent micro-level research.

For the justifications of a concentration on the Baltic states, it can be observed that they are an obvious grouping (on an EU-wide basis) due to their geographical location and shared history both in terms of the Soviet Union and their entries into the European Union in 2004 (Poissonneir, 2017; Bungis, 1998; Smith, 2005). Furthermore, they differ from other post-Soviet states in that they all have the recent history of a period of independent statehood from 1918-1940. This is an aspect which is said to impact on the understandings of sovereignty and national symbols, as well as playing a role in their ‘national reawakenings’ towards the end of Soviet rule (Smith, 1996). In terms of economic indicators, the three are felt to be reasonably integrated through “common factors and economic links” (Poissonneir, 2017, p. 1.). Yet, the three countries are of course not homogenous and there are variances in terms of economic performance and living standards (Ibid.).

The minority situation in the three Baltic states have similarities; as previously mentioned, all three are signatories of the Framework Convention for the Protection of National Minorities. In relation to this, much of the work from international organisations grouped the three states together – for instance the work of the OSCE High Commissioner on National Minorities through the 1990s (Zaagman, 1999). Much of this of course was due to the shared legacy of the Soviet Union, and (in relation to the points outlined in the previous paragraph) this tied these three closer than other post-Soviet countries.³ They indeed also all have sizeable Russian minorities⁴ which grew in number post WWII, and thus all three Baltic countries have faced

related policy decisions and challenges following independence – including externally from the influence of Russia (Smith, 2005). It was the case that the ethnically Russian populations residing in the Baltic states suddenly found themselves a minority within newly independent states and therefore faced the challenge of transforming from the majority (within the Soviet Union) to a minority (Best, 2013). However, there are also variances in policy towards minorities and integration between the states, with Lithuania adopting a more inclusive approach in its citizenship requirements in comparison to Estonia and Latvia which took a hard-line and led to issues of non-citizenship / statelessness (Poleshchuk & Tsilevich, 2004; Bungs, 1998, pp. 50-55).⁵ This is of course a drastic summary of a complex history in the region, but it serves the point to illustrate that the three countries offer a balance of similarity and difference allowing for a comparison of the regional situation. Furthermore, these differences should be borne in mind when analysing the regional level data that this Working Paper maps out, and any consequent qualitative analysis should factor in the historical context further.

In terms of existing data and literature on the minorities in the three states, in comparison to other European states there is a fair amount. Already having census data which shows population by ethnicity and (for the purposes of this research) by region is a great help and something that cannot be taken as a given across Europe.⁶ Despite the criticisms and potential issues with census data, it is at least a good starting point and more reliable than broad estimations. Furthermore, the cyclical monitoring undertaken by the Advisory Committee on the Framework Convention for the Protection of National Minorities provides regular overviews and reports on the situation of national minorities along the thematic lines of each FCNM article.⁷ However, it does not focus on information regarding the broader situation surrounding minorities in the areas in which they reside and as such – as per its aims of protection rather than empowerment – does not demonstrate how or if minorities contribute to regional development, as the broader research agenda of this Working Paper intends to do.

3. Methodology

As alluded to in the introduction, the aim of this Working Paper is mostly exploratory and to search for trends, outliers or general points of interest for the purpose of future case study selection. Nonetheless, the main research question of this Working Paper is ‘is there a relationship between the percentage of minorities in a region and the development of that region’. Seeking a relationship or patterns does not mean that the Working Paper seeks to prove causality, however. Furthermore, regional development is a broad term and indicators of such



cover many topics, thus the further aim is to ascertain what similarities regions might have and where there are outliers, even if there is no general statistical relationship.

With the research question in mind, the independent variable can be seen as the percentage of minority population and the dependent variable as regional development. Minority population is measured using census data on ethnicity disaggregated to the regional level, whilst regional development is measured using a variety of indicators through Eurostat and OECD regional data. Thus, the data used in this Working Paper is entirely secondary data. However, given the regional aspect of the analysis, it is important to outline how specifically the data is divided into measurable areas – as is outlined in sections 3.1 and 3.2 below. The data will then be plotted onto scatter plots in order to visualise patterns, outliers or trends, as well as being tested through bivariate regression analyses to ascertain whether there is a statistical linear relationship. This will first be presented for each country separately, and then as a comparative analysis across all three states.

3.1 NUTS Classifications and Census Data

The Working Paper uses the regions outlined in the Nomenclature des Unités Territoriales Statistiques (NUTS) for the EU (Regulation EC No 1059, 2003) and the Territorial Levels used by OECD (OECD Centre for Entrepreneurship, SMEs, Regions and Cities, 2018), which equate to the same regional level codification.⁸ Due to the small size of the countries in focus, the only NUTS level of relevance is Level 3, as Levels 1 and 2 are already at the country-wide level⁹ and thus can only provide national data as opposed to regional. As such, there are five regions in Estonia, six in Latvia and ten in Lithuania (Regulation EC No 1059, 2003). Under this breakdown, a series of indicators which aim to measure regional development are available through Eurostat and the OECD's Regional Well-Being for the three Baltic countries. However, in order for these indicators to be useful in the context of national minorities, it is also necessary to ascertain population data broken down by ethnicity and region. For this, national census data is used to calculate percentages of minorities residing in the regions, taking the raw statistics provided for each region and matching them with the NUTS level 3 boundaries. In the case of Estonia, the census data is broken down by county level into fifteen different counties which form the five NUTS level 3 regions (Statistics Estonia, 2015).¹⁰ For Latvia, the breakdown of census data by ethnicity into six regions matches the six NUTS level 3. Similarly, in the case of Lithuania, ethnicity data is broken down to county level which matches the ten NUTS level 3 regions. This population data is taken from the most recent



available, which varies per country but are all based upon the national censuses of 2011 that took place across the EU. In Estonia more updated data is available based on reported changes through local administration,¹¹ however, for reasons of consistency and consequent comparative analysis, it is held that it is better to use the data from the 1st January 2012 in Estonia to be as close as possible across the three countries as updated data is not available in Latvia and Lithuania.

This Working Paper then provides an initial table summarising the population calculations for each country by region, ranked by the region with the highest percentage total of national minorities (included as appendices). This statistic is calculated by the author in the following manner: percentage of majority population (i.e. Estonian, Latvian or Lithuanian in each case) plus percentage of unknown data,¹² subtracted from 100 (to leave the remaining population as belonging to a minority ethnicity). This is then double-checked against the data given for all of the non-majority populations in order to ensure that the two figures match. As well as a total percentage of minorities figure, the initial table will also provide individual figures for the largest minorities in that region / country. This allows further analysis of specific minorities and whether any patterns emerge along these lines.

3.2 Eurostat and OECD Indicators

After calculating the percentage of minorities by region from the census data, a second table provides the comparative data of the regional development indicators. This allows the reader to view each region (ranked by NUTS code) and how it performs in relation to another by the indicators available. As mentioned in the introduction, the regional development indicators are taken from Eurostat and the OECD Regional Well-Being data which is broken down to the NUTS level 3 and thus matches the population data.

The only Eurostat NUTS level 3 indicator considered to be of real relevance is the figure for GDP as a % of EU 28 average. This figure allows a basic macro understanding of how economically developed each region is in comparison to the rest of the EU. Moreover, this figure is a percentage and can of course be above 100% given that 100% represents the exact EU average.

As a result of the limitations of the relevant data available at NUTS level 3 from Eurostat, further indicators are taken from the OECD Regional Well-Being tool. This typically displays up to 11 topics which the OECD considers to be important for well-being. As will be



demonstrated in the analysis of the Baltic countries and the summary table below (Figure 3.1), not all topics have data available for each OECD country. As such, there are 9 topic areas for Estonia, 6 for Latvia, 7 for Lithuania, and thus 6 available for a comparison across all three countries. Each topic area is scored out of 10 and as Figure 3.1 shows, is based on measurable indicators of which some topics feature more than one. The analysis of this Working Paper uses the raw data as opposed to the score in order to provide a more statistically robust approach. As such, there are 11 indicators provided for Estonia, 8 for Latvia and 9 for Lithuania.

Figure 3.1 OCED Regional Well-Being Topics and Measurable Indicators

Topic	Measured by
Access to Services	Share of households with broadband access (%)
Civic Engagement	Voter turnout (%)
Education ¹³	Share of labour force with at least secondary education (%)
Jobs	Employment rate (%)
	Unemployment rate (%)
Community ¹⁴	Perceived social support network - % of people who have friends or relatives to rely on in case of need.
Environment	Estimated average exposure to air pollution in PM2.5 ($\mu\text{g}/\text{m}^3$), based on satellite imagery data.
Health	Mortality rate – age adjusted, figure per 1,000 persons.
	Life expectancy at birth (measured in years).
Safety	Homicide rate: per 100,000 persons.
Life Satisfaction ¹⁵	Life Satisfaction Index: Average self-evaluation of life satisfaction on a scale from 0 to 10

Source: OECD Regional Well-Being User Guide (OECD, 2019, p. 13).

Furthermore, as detailed in the OECD's Regional Well-Being user guide (OECD, 2019), the data for each measurable indicator varies in terms of year. This is based on latest data available but generally varies from 2015-2017 in the case of the three countries in question.¹⁶ The two topic areas for which no data is available at the regional level across all three countries is Income and Housing. The former of these is somewhat compensated for by the Eurostat GDP average of EU 28 data outlined above.

3.3 Data Limitations

Census data of course comes with its limitations as well as methodological accuracy concerns, particularly when collecting data on racial or ethnic origin. This applies to multiple different dimensions, within and across states. In the European context, there are definitional discrepancies between states in terms of what is considered as ethnic or national origin and thus comparison across states can be difficult (Farkas, 2017). Moreover, many states do not collect data on ethnicity as they consider it to breach national level legislation on sensitive data, an aspect that leads to a lack of data in general as well as an over-reliance on third-party identification (Chopin et al, 2014). In the case of the Baltic states, the ethnicity data is collected via census and thus is a process of self-identification. Nonetheless, there are still reliability issues with self-identification that should be considered when evaluating the accuracy of such data; for instance, pressures to identify as the majority or not-stating ethnicity for a variety of reasons (including fear of consequent discrimination). This often therefore leads to high figures for ‘unknown’, for which it is of course not possible to calculate ‘unknown ethnicity’ into the total minority population figures and thus the figure could be deflated. Moreover, there can also be the case of census collectors ‘guessing’ the ethnicity of household members. In extreme cases there is also concern of authorities manipulating or misusing the data for political purposes, with plenty of historical examples to take note from (Goldston, 2001). For these reasons, the accuracy of ethnicity data may not be exact, and this could be an issue if using percentage thresholds to set policies for instance. Thus, it is important to bear these factors in mind and to investigate the quality of the data more closely. In the specific case of the Baltic states, the census data from 2011 was the first to be defined in detail through EU legislation and was therefore subject to tighter accuracy and quality management (Eurostat, 2019). Furthermore, no major issues were flagged for any of the three countries in terms of accuracy.¹⁷ Thus, for the purposes of this Working Paper and its aims as a general mapping exercise, the census data used is considered sufficiently reliable for gauging an overview of the regional development situation.

In terms of statistical consistency between the census data and the data used as indicators of regional development, there is the obvious aspect of a time lapse. The regional development indicators use the most recent data (varying per country but generally between 2015 and 2017 – see note #16), whilst the census data is from 2011 – the most recent available. Whilst there is a time lapse here, census data is only available once every 10 years and thus it is common



practice in academic research to use census data knowing that it is not updated as often as annual statistics such as GDP. Further, in the context of national minorities and for the broad general purpose of this Working Paper, the geographical areas inhabited by minorities are historically grounded and although exact figures might fluctuate over time, in the space of less than half a decade this will not be significant enough to dramatically alter the statistics.

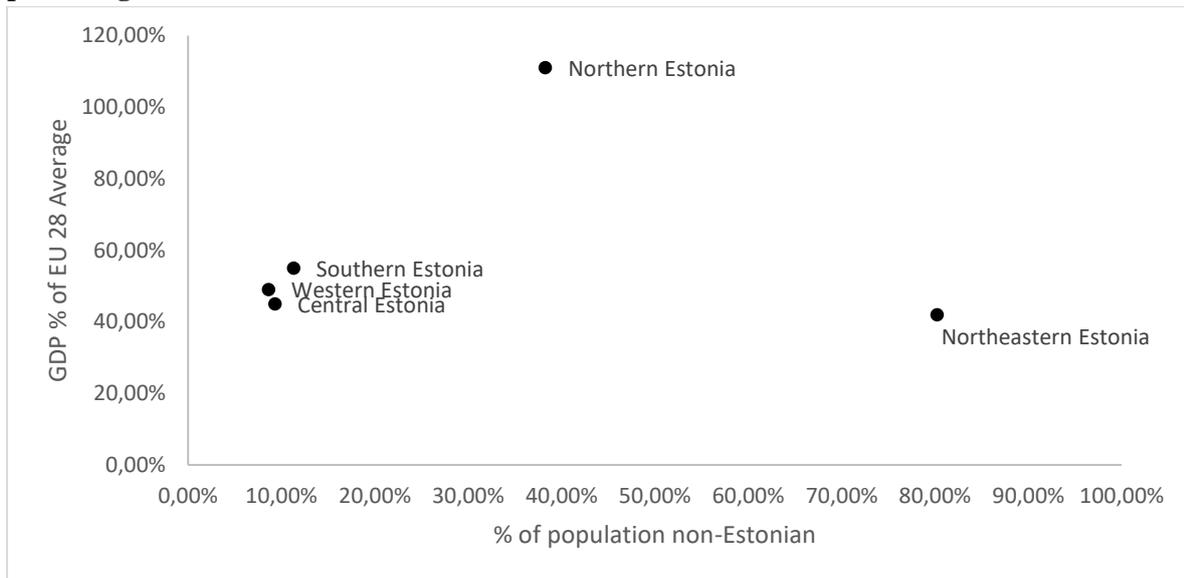
4. Empirical Analysis

4.1 Estonia

The initial calculations show that the percentage of persons belonging to an ethnicity other than the ‘majority’ Estonian, varies greatly across the country with a stark division between east and west. Indeed, as can be seen in Appendix I, this figure fluctuates from a low of 8.61% in Western Estonia (EE004), to a high of 80.24% non-Estonian in Northeastern Estonia (EE007); a staggering difference. Russian constitutes a large percentage of the minority population across all regions and constitutes a numerical majority of 72.39% of the population in Northeastern Estonia. There are also significant Ukrainian and Belorussian populations of over 2% in certain regions, as well as a vast number of numerically smaller ethnicities spread across. Despite the overall figure of non-Estonians being 30.34% of the population in Estonia, it is clear to see from Appendix I that this is not spread equally across the country. Thus, there are significant differences allowing to statistically test whether the percentage of non-Estonians makes a difference in terms of regional development indicators.

Consequently, the total minority figures for each region were then plotted against the regional development indicators and are displayed in full in Appendix II. Upon initial observation it appeared that there are no obvious patterns, but in order to statistically test this, a series of bivariate regression analyses were completed (Appendix III). This shows that for most of the indicators of regional development there is no significant linear relationship with percentage of non-Estonian population. This includes GDP as a % of EU 28 average, which is shown in Figure 4.1.1 below as a scatter plot.

Figure 4.1.1: Regions of Estonia in terms of GDP % of EU 28 average and total minority percentage.



As can be observed, the major divide in terms of GDP is between Northern Estonia (home to the capital city of Tallinn) and the other four regions, of which there is little difference. Thus, it seems that the regions (away from the capital city) containing a high percentage of minorities are indeed economically deprived (which is of course a concern) but not particularly worse off than other regions.

In terms of the indicators from the OECD Regional Well-Being index, the only indicator that shows a statistical relationship is that of life satisfaction. Here the raw data shows that there is a correlation between higher minority percentage and lower life satisfaction. However, it is possible to observe that all 5 regions are very similar and score between 5 and 6 out of 10, a very small fluctuation and thus not particularly useful. A comparison to Latvia and Lithuania would be more useful therefore, but unfortunately the OECD database does not offer this data for those countries.

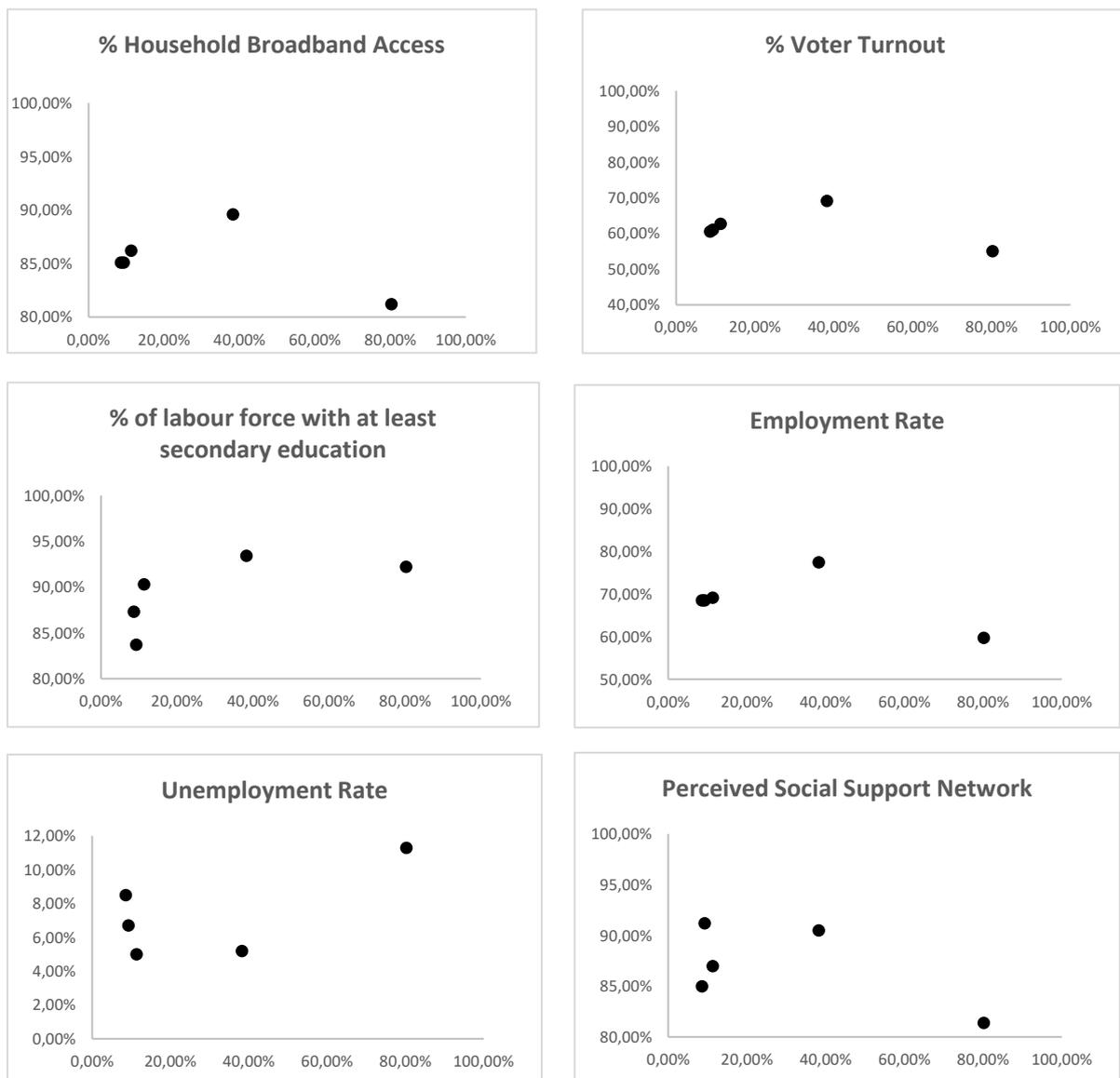
Other points of interest:

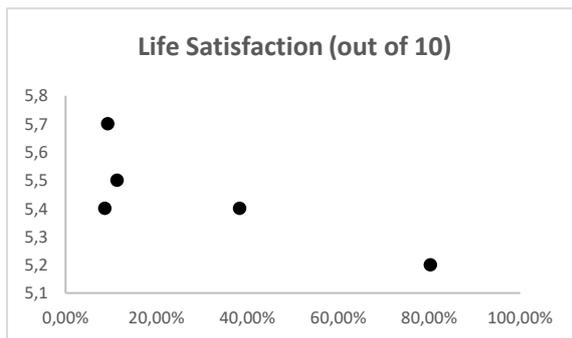
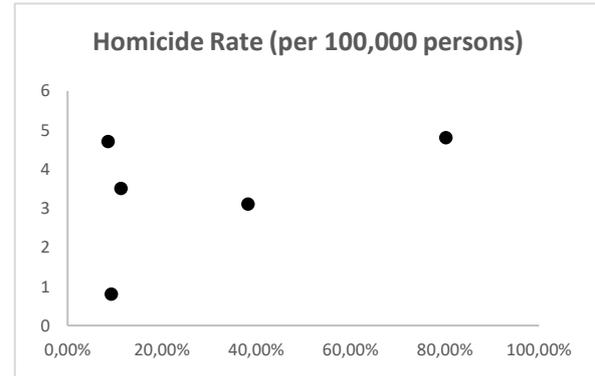
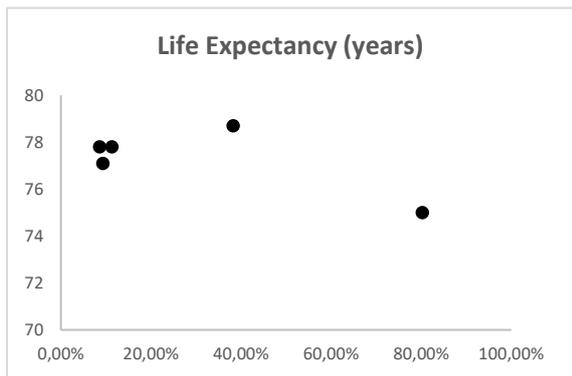
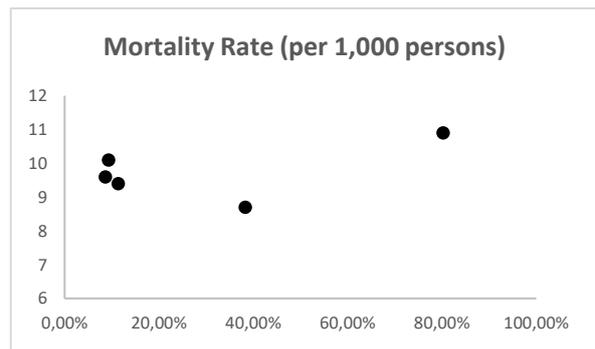
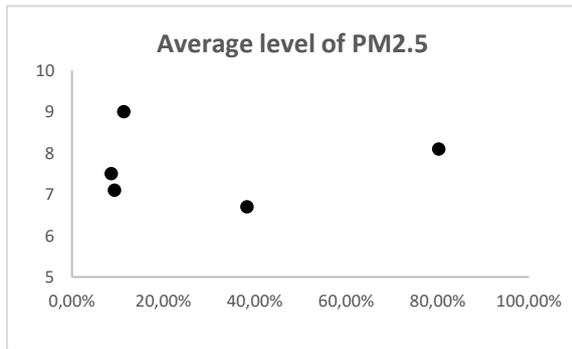
- Northeastern Estonia (EE007) is generally the worst performing region in Estonia, with the lowest GDP % of EU 28 average, lowest employment rate, highest unemployment rate, lowest voter turnout, lowest life expectancy, highest homicide rate and lowest life satisfaction. It is home to 72.39% Russian as well as significant Ukrainian, Belorussian and other ethnicities, plus it is the only region where Estonians constitute less than 50%

of the population (19.32%). However, it does have the second highest level (behind only the capital region of Northern Estonia) of education attainment.

- Although the other three non-capital regions score better than Northeastern Estonia, they are all generally lagging far behind Northern Estonia (EE01). This is the case with almost every indicator of regional development and suggests that the divide is very much capital city vs rest of country. Thus, it would seem that minority populations in and around Tallinn have better macro surroundings and in theory better opportunities. However, micro-level research would be needed to understand this in more detail, including perhaps an analysis at the neighbourhood level in Tallinn if such data could be sought.

Figure 4.1.2: OECD Regional Well-Being Indicators for Estonia.





Notes: The x axis is always minority population and the positions for each region are always the same on the x axis, thus the region name can be ascertained from Figure 4.1.1 which lies in the same fashion – rather than relisting the data labels on these smaller charts. The y axis is the regional development indicator as listed in the graph title above.

Source: Data taken from Appendix II, based on primary data from the Estonian census, Eurostat and OCED Regional Well-Being.

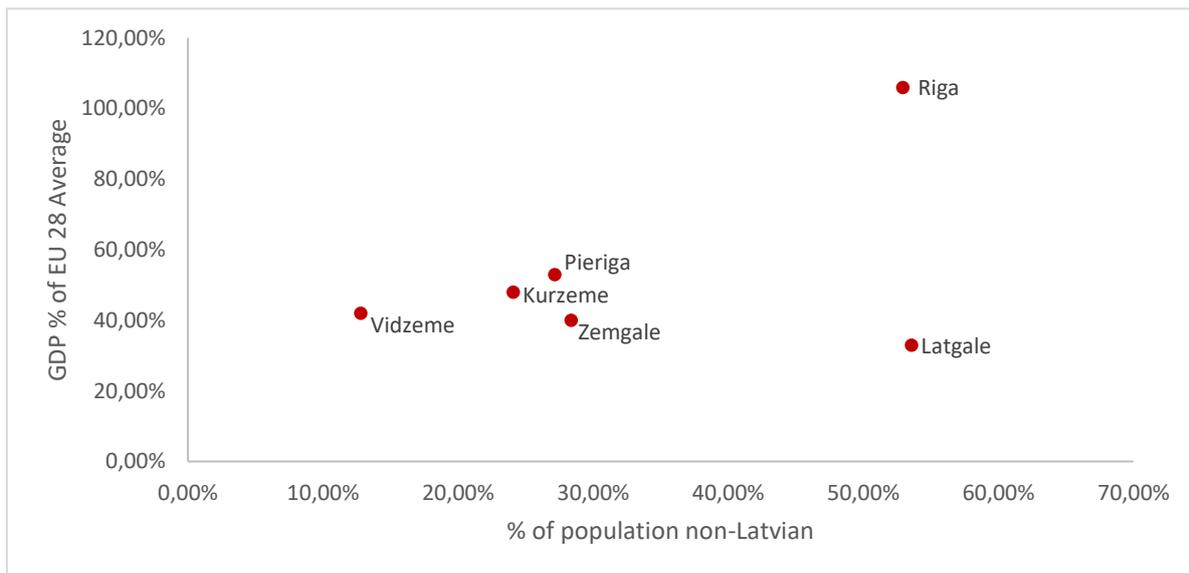
4.2 Latvia

As with Estonia, the demographics in Latvia are divided along ethnicity lines but to a slightly lesser extent. Appendix IV shows the breakdown of each region by ethnicity and a total percentage of minorities. As can be seen, there is less of a polar divide in terms of total percentage of minorities, with the highest at 53.59% in Latgale (LV005) in the southeast of the country, compared to the lowest Vidzeme (LV008) in the north at 12.81%. Yet 3 of the 6 regions have between 20% and 30% minority populations and the capital city of Riga is made

up by 46.33% Latvian and 52.95% minorities. Thus, it is possible to initially view that demographically Latvia is more evenly spread than Estonia in terms of minorities. Nonetheless, there are still differences between regions and thus it is possible to test whether regional development figures fluctuate along minority percentage lines.

As such, Appendix V lays out each region of Latvia and the corresponding indicators of regional development. Firstly, the Eurostat data on GDP % of EU 28 average and then eight indicators from the OECD Regional Well-Being index. This is two less than Estonia, with the figures for the share of labour force with at least secondary education and for life satisfaction not available. The scatter plot results can be viewed below in Figures 4.2.1 and 4.2.2, which demonstrate an overview of each region. As with Estonia, the larger graph (Figure 4.2.1) includes labels of region names and the consequent smaller graphs keep the same x axis (minority %) and thus each region is in the same place on the x axis throughout.

Figure 4.2.1 Regions of Latvia in terms of GDP % of EU 28 average and total minority percentage.



As can be observed from Figure 4.2.1, Riga is a clear outlier in terms of GDP but also having a high minority population percentage. The other five regions are all reasonably similar in terms of GDP whilst having contrasting levels of minority population, thus indicating a capital city v peripheral divide. Figure 4.2.2 demonstrates this further, with Riga often outperforming the other regions, although the divide remains most prominent with the measurement of GDP¹⁸ – as was the case with Northern Estonia (Tallinn) above.

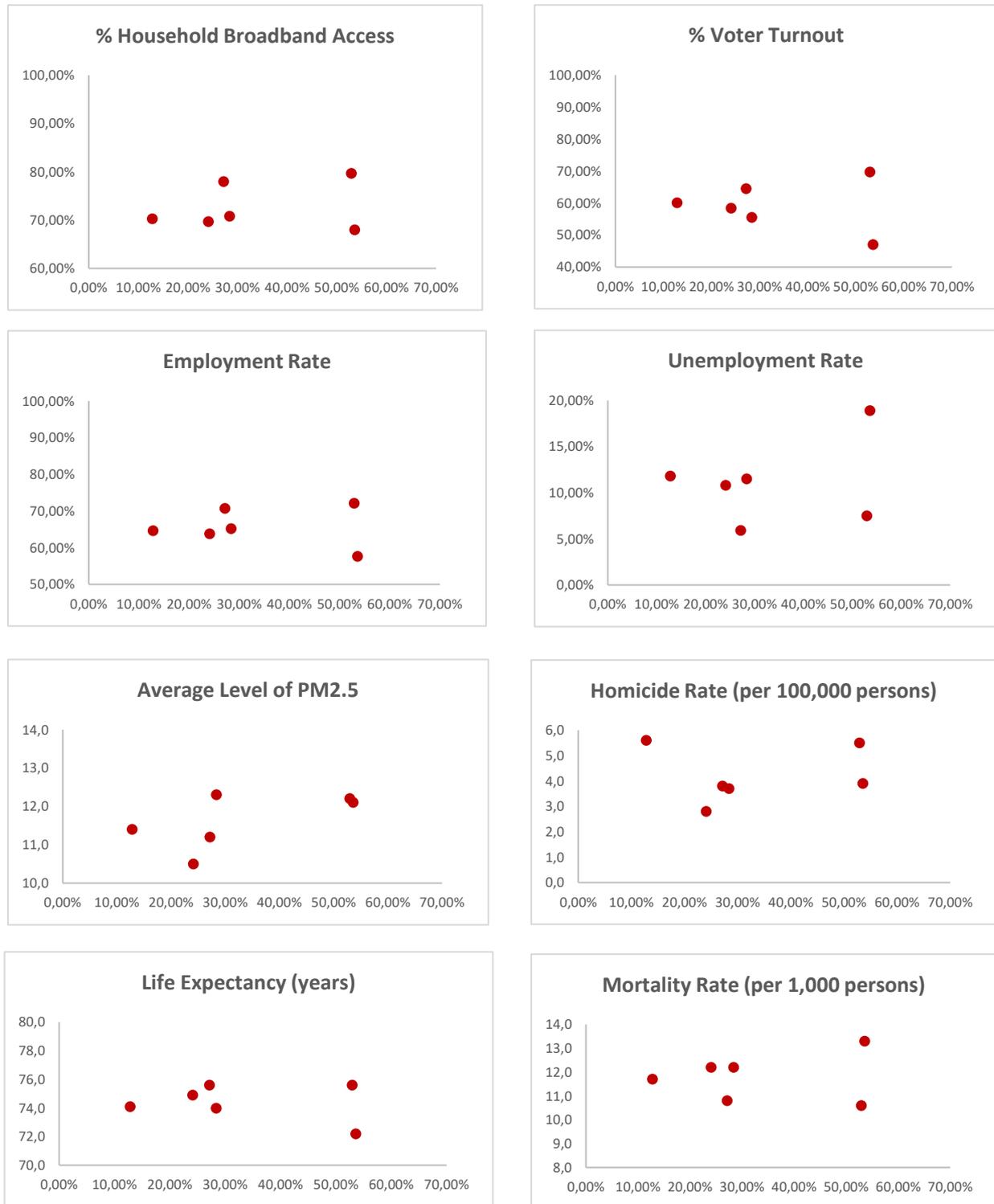


In order to test for a statistical correlation, another series of bivariate regression analysis was then run for each of the regional development indicators against the percent of minority population, the figures for which are shown in Appendix VI. As can be observed, there were no linear relationships with any statistical significance. Thus, the size of the minority population in a region appears to have no relationship to its regional development indicators, as was the case with Estonia. Similar also with Estonia is the case that one peripheral region with a large minority population (Latgale) is generally the worst performing region in the country. However, unlike with Estonia, in Latvia there are a group of regions which perform similarly with regard to regional development indicators but have varying sizes of minority population: Zemgale, Kurzeme and Vidzeme. This offers some evidence that regions with a higher minority population are not necessarily worse performing than those with a lower one – if you remove the outlier of the capital city.

Other points of interest:

- Riga is the strongest performing region but is almost split half and half between the Latvian majority and a variety of minorities. In terms of total minority population, it is very similar to the region of Latgale, yet the two are polar opposite in terms of development indicators as can be seen in the scatter plots and raw data. Latgale has the lowest GDP % of EU 28 average in Latvia, the lowest employment / highest unemployment, the lowest voter turnout and lowest life expectancy.
- The region of Pieriga outperform regions with a similar minority population in most development indicators. Geographically it is located immediately next to Riga, thus furthering evidence that the development divide is along capital / periphery lines.

Figure 4.2.2 OECD Regional Well-Being Indicators for Latvia.



Notes: As with Estonia, The x axis is always minority population and the positions for each region are always the same on the x axis, thus the region name can be ascertained from Figure 4.2.1 which lies in the same fashion – rather than relisting the data labels on these smaller charts. The y axis is the regional development indicator as listed in the graph title above.

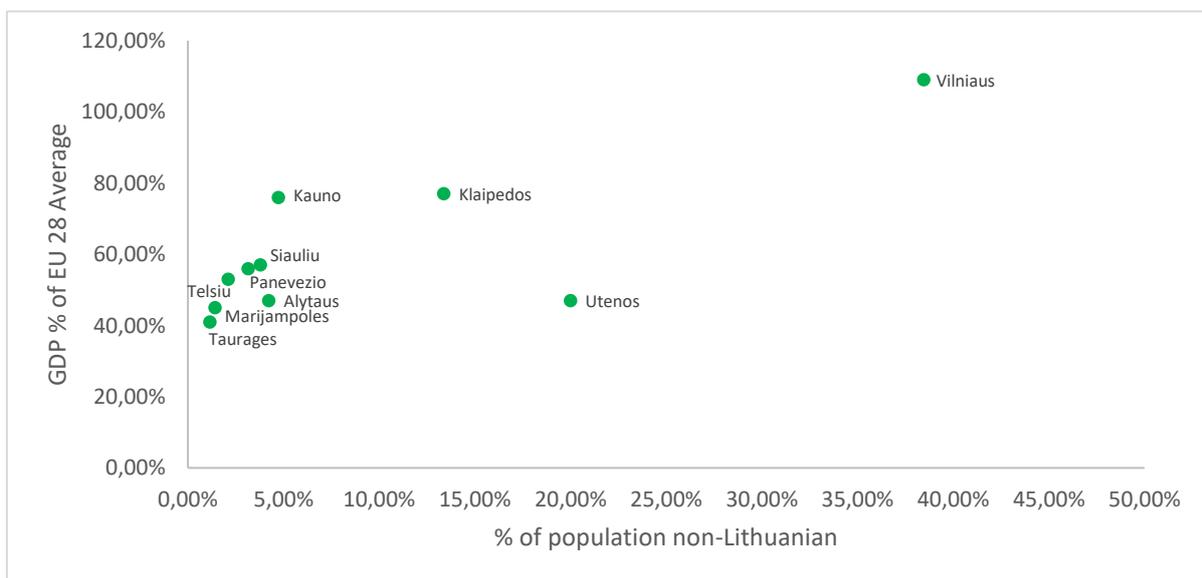
Source: Data from Appendix V, based on primary data from the Latvian census, Eurostat and OECD Regional Well-Being.

4.3 Lithuania

The situation regarding the regional spread of national minorities varies again in Lithuania, in comparison to Estonia and Latvia. Firstly, the NUTS level 3 is split into 10 different subdivisions, partly reflecting Lithuania’s larger population. Thus, there are much more regions to examine and the minority population is further spread due to the absolute figure being similar to Estonia and Latvia but the percentage being much lower (14.76% minorities as opposed to over 30% in the other two states). Nonetheless, there are still great variations by region, fluctuating from as small as 1.15% of the population to 38.47%. Appendix VII details the exact minority population figures and subsequent percentages.

The same process was then undertaken for Lithuania as with Latvia and Estonia, plotting the regional development indicator figures by region and comparing them to the minority percentage population. These are detailed in Appendix VIII and displayed in Figures 4.3.1 and 4.3.2 below. As with Latvia, there is slightly less indicators from the OECD Regional Well-Being, with the data for Community and Life Satisfaction. Unlike Latvia however, the data on education is available for Lithuania.

Figure 4.3.1 Regions of Lithuania in terms of GDP % of EU 28 average and total minority percentage.



A series of bivariate regressions were then completed in order to test for a linear relationship, for which most indicators had no significant relationship. There was a notable exception with the case of GDP % of EU 28 where there was a small but statistically robust relationship



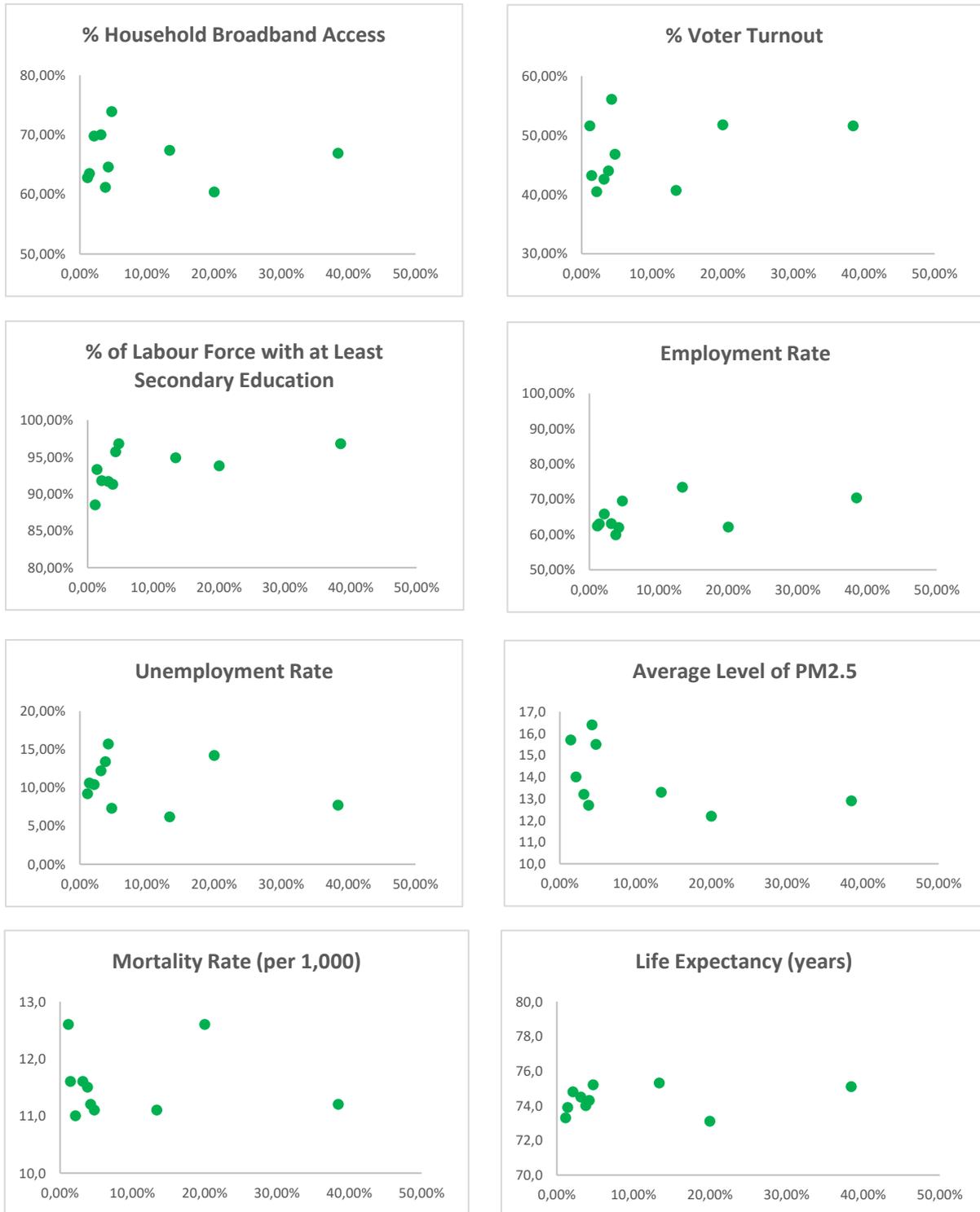
suggesting that the higher the minority population in a region, the higher the GDP % of EU 28 average figure. This shows that there is a correlation but of course the causation is by no means proved; time-series data would be necessary for this. Whilst it is an interesting observation, caution should be taken in interpreting it as generally positive, because the region in Lithuania with the highest minority population is the capital area of Vilnius. Thus, given the data on other capital vs peripheral divides, it is likely to be a coincidence rather than a causation.

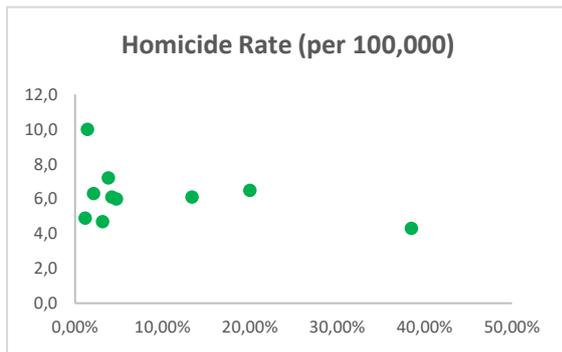
More broadly, the data shows that there is again a capital vs peripheral divide, with the other well-performing regions centred around the two other major cities in Lithuania; Klaipeda and Kaunas. The four worst performing regions in terms of GDP % of EU 28 average, vary greatly with regard to minority population (Taurages, Marijampoles, Alytaus, Utenos). Their minority population varies from 1.15% to 20% but score similarly poorly in terms of most regional development indicators, suggesting that whilst the significant minority populations in peripheral regions face reduced opportunities and poor development, it is equally the case for peripheral regions with very low minority populations. This is similar to Latvia but even more profound, suggesting that whilst regions with higher minority populations face great challenges, they are not any worse performing than other peripheral regions. Further points of interest:

- Kauno and Klaipedios – similar performance but completely different minority percentage - both are urban hubs in Lithuania. Demonstrating a clear example of what is outlined above; a large minority population is not necessarily a hindrance to development.
- Many regions with very low minority population, the lowest across the Baltic States – thus a lot less balanced than Latvia / Estonia. As mentioned above, such regions completely vary with regard to regional development scores; Kauno scores very high, whereas Taurages, Marijampoles are both very low.
- Less of an overall Russian population than Estonia and Latvia, but also the capital city regions are demographically constructed differently. Whereas Tallinn (Northern Estonia) and Riga have around 30 and 40 percent respectively, the figure in Vilnius is only 10% - whereas there are 22% Poles. Does this constitute a difference? Consequent qualitative analysis could examine this aspect.



Figure 4.3.2 OECD Regional Well-Being Indicators for Lithuania.





Notes: The data set for environment is missing for the region of Taurages on the OCED Regional Well-Being portal. As with Estonia and Latvia, the x axis is always minority population and the positions for each region are always the same on the x axis, thus the region name can be ascertained from Figure 4.3.1 which lies in the same fashion – rather than relisting the data labels on these smaller charts. The y axis is the regional development indicator as listed in the graph title above.

Source: Data from Appendix VIII, based on primary data from the Lithuanian census, Eurostat and OECD Regional Well-Being.

5. Comparative Analysis

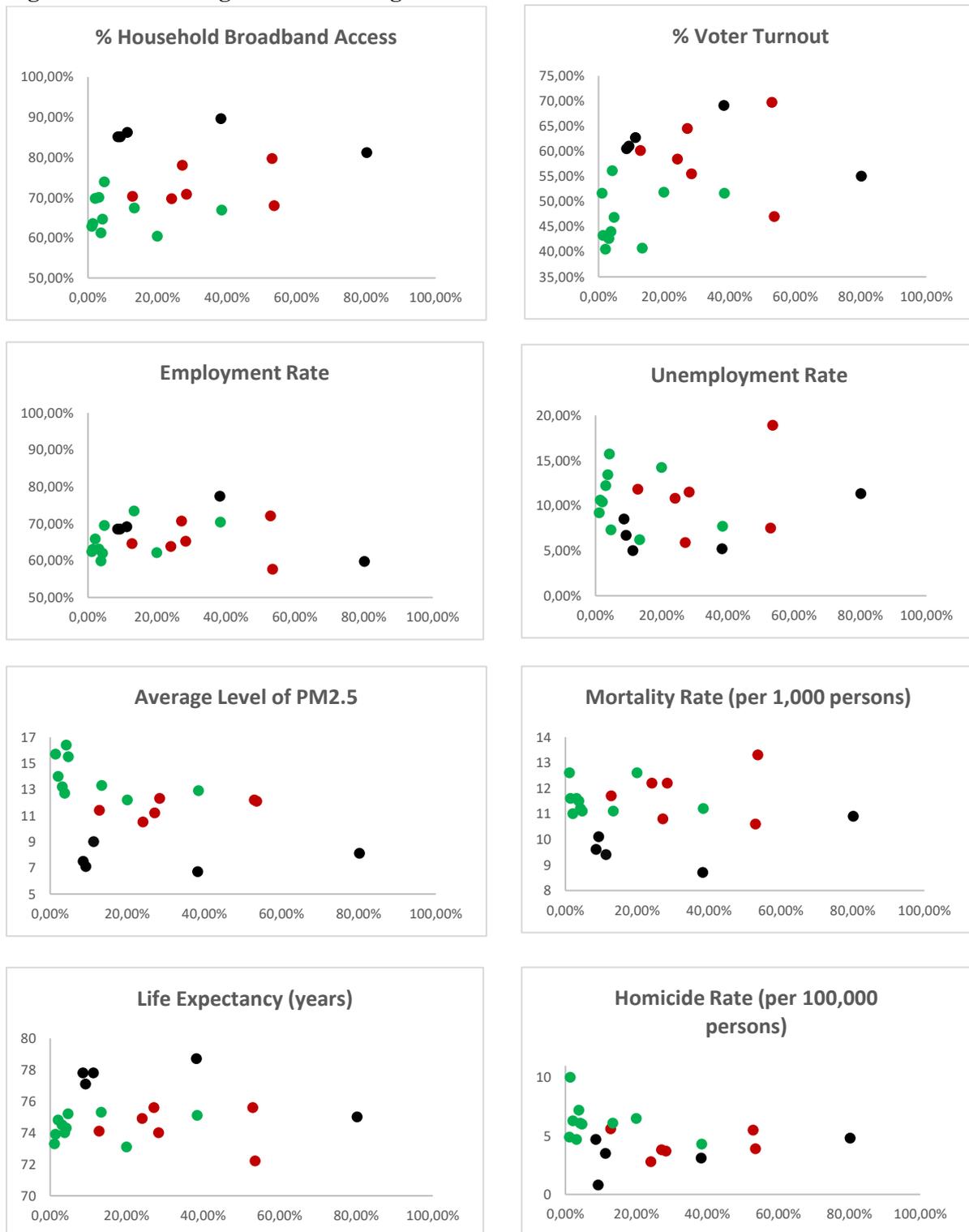
Given the lack of statistical correlation in all three Baltic states between percentage of minority population and indicators of regional development, a comparison of all three should not expect to suddenly change this. However, it can be useful to explore variations of the x variable and ascertain whether removing outliers makes a difference. Firstly, Figures 5.1 and 5.2 depict scatter plots of all of the y variables against the x variable of total minority population, this time showing all 21 regions across the 3 Baltic states. This combines the three different data point colours used above (Estonia – black; Latvia – red; Lithuania – green). As can be observed in Figure 5.1, the three capital city regions (Northern Estonia – home to Tallinn, Vilniaus and Riga) are clear outliers in terms of GDP. Furthermore, Figure 5.1 shows a large cluster of regions which score between 40-60% of GDP but range from just a few % minority population, up until almost 30% of the population belonging to minorities. This indicates that the general picture of the Baltics is one of underdevelopment away from the capital cities, regardless of minority population sizes. Zemgale, Latgale and Northeastern Estonia are outliers in the sense that they are much larger than most regions in terms of minority population percentage but still significantly underdeveloped in relation to the capital cities. Kauno and Klaipėdos are regions which outperform the average in terms of GDP, but which contain two significant urban populations in the cities of Kaunas and Klaipėda.



Further points of interest across the three states:

- Across the three countries, the most significant pattern overall appears to be differences between countries rather than similar regions. However, the capital city regions are usually outliers and outperform the peripheral regions both within and across countries (ie. Vilnius outperforms Northeastern Estonia or Latgale in most indicators).
- Although the peripheral regions are often equally underdeveloped for areas with large and very small percentages of minorities, the three capital regions all have between 35-55% minority populations and thus sit in the middle of the x axis. As such it might be useful to consider what role the large minority populations play in the successful performance of the capitals and whether there are any exemplary practices which can be replicated in peripheral areas. Furthermore, if the data is available, it would be insightful to analyse the capital cities by neighbourhood to ascertain any variances at this level.
- All three states have regions with large Russian populations, both in the capital cities and in peripheral areas. Although the literature suggests that there are many issues facing Russian minorities, the regional development data suggests that there must also be differences within the minority. Ie Russians living in Tallinn, Riga or Vilnius are surrounded by better macro conditions than those living in rural areas.

Figure 5.2 OECD Regional Well-Being Indicators across the Baltic states.



Notes: As with each individual country analysis above, the x axis is always minority population and the positions for each region are always the same on the x axis, thus the region name can be ascertained from Figure 5.1 which lies in the same fashion – rather than relisting the data labels on these smaller charts. The y axis is the regional development indicator as listed in the graph title above.

Source: Data from Appendices II, V and VIII.

6. Conclusions

The core conclusion from this Working Paper is that there is no clear linear relationship between the percentage of national minorities in a region and that region's development. This is not a great surprise but one that can now be backed up with statistical analysis. What this does immediately indicate is that regional development in the Baltic states with relation to minorities is a complex situation and one that cannot be generalised. The main takeaway in terms of divisions within each state is that this is between urban and rural areas, in particular the capital city. Indeed, each capital city greatly exceeds every other region in most regional development indicators, especially GDP as % of EU 28 average (as shown in Figure 5.1). The situation was similar across the three countries with regards to the OECD Regional Well-Being indicators, with the capital cities always being the best performing regions. However, when observing this data (Figure 5.2) it can be seen that there is also a general division between countries, with Estonia being generally best developed overall, followed by Latvia and then Lithuania. This trend also transcends minority population figures, so that a region in Lithuania is generally lower performing than a region in Estonia regardless of what percentage of minorities it has – similar or totally different.

With the minority population percentages being high in capital city regions but also high in other more peripheral regions, it is possible to conclude that there is a division between the environments in which minorities live even within a state / the Baltic area. This demonstrates that opportunities are not the same for even the same minorities within the same country. Of course, the limitations of these findings must be considered and the data paints a general picture of the region in which minorities reside rather than pinpointing any causality. How minority populations affect the situation in each region remains unknown and would be an aim in consequent qualitative research on a concentrated scale. To summarise some of the potential case studies this analysis has produced, three examples below are of particular interest and could form the basis for further in-depth research in both a quantitative but also qualitative approach:

- **The three capital cities:** all three are outliers when compared to other regions in each country, scoring best on regional development scores. Similarly, all three have reasonably similar levels of minority population percentages despite varying internal differences of other regions. Of relevance here is also potential internal migration patterns – are minorities moving / have moved to the capitals because these regions are

more developed? Or what role have minorities played in developing the capital city regions? Analysis of neighbourhoods could be useful here, attempting to ascertain whether development statistics vary between neighbourhoods of high minority populations and those of low.

- **Riga vs Latgale:** two Latvian regions with the highest minority percentage in the country at around 35%, but with completely polar scores on measurements of regional development.
- **Kauno v Klaipėdos:** similarly developed regions in terms of regional development scores but with contrasting minority population percentages. What does this mean for minorities and policy-makers in Lithuania? Detailed analysis of these areas could offer further evidence that a larger minority population does not hold back a region, even if it is not necessarily advancing it either.

In addition, further research could look at specific minorities (rather than a total percentage) and observe whether there is any relation or pattern emerging. This could be of particular relevance for the Russian minority which is very sizeable in Estonia and Latvia. Again, this analysis could be made within the regions of one of the countries but also across all 3 – for example asking whether the Russian population in Estonia fares better or worse than in Latvia in terms of the development statistics for the regions it resides in. Another element could be to only look at minorities in a region by region context, i.e. considering the national majority to be a minority and whether this changes the statistics. For example, how does the Estonian population fare in Northeastern Estonia where they only number around 19% of the population. Moreover, analysis could also look at the composition of minorities, in terms of any effect from having just two substantial communities (like in Northeastern Estonia) or several (like for instance in Vilnius).

In terms of heightening the statistical methods used, further analysis could also use dummy variables to control for certain aspects (for instance the amount of EU structural / cohesion funding given to an area), or indeed using models to test for non-linear relationships. These aspects would be beyond the initial scope of this Working Paper, however this would constitute useful consequent research.

Thus, this research should be seen as a starting point in which to move forward to intensified research on a regional scale or even a micro scale. The data used as regional development indicators in this research do not allow for an analysis of the activity or situation of minorities



alone and thus to ascertain this there would likely need to be primary research on a concentrated level. Nonetheless, this research therefore stands as a point of comparison and if such data on minorities was possible to obtain, then this could be directly compared to the performance of the region at large as detailed here.

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Notes

¹ All three states have ratified the Framework Convention for the Protection of National Minorities and thus are monitored cyclically by the Advisory Committee. See footnote 5 for further details.

² See Baerenholdt's chapter in the International Encyclopedia of Human Geography for the background on non-economic aspects of regional development (Baerenholdt, 2009).

³ For a detailed overview of the contemporary history of the three Baltic states, including the migration patterns and independence movements, please see Lieven (1994).

⁴ As will be outlined both in the literature and appendices of data, the size of the Russian minorities does vary within each state. The figures are as follows: Estonia – 25.30%; Latvia – 26.91%; Lithuania – 5.81%.

⁵ As detailed in footnote 4, the Russian population is much lower in Lithuania and thus this quite possibly explains the differences in policy. This is something to bear in mind when interpreting the results of this Working Paper.

⁶ Data on ethnicity varies greatly across Europe and certain countries do not permit such a practice due to national level laws (Chopin et al, 2014). The three Baltic states do include ethnicity data in their respective censuses and thus this is a useful starting point, especially given that this is undertaken by self-identification.

⁷ Country specific monitoring reports and opinions for the most up to date cycles can be viewed on the Council of Europe website: <https://www.coe.int/en/web/minorities/country-specific-monitoring>

⁸ From here on, the Working Paper will refer to the regional levels by their NUTS level, for the purpose of ease and consistency. It should be born in mind that the region codes supplied are exactly the same in Eurostat and OECD publications; i.e. EE00 for Estonia is NUTS level 2, and Territorial Level 2, EE001 for Northern Estonia is NUTS Level 3, Territorial Level 3.

⁹ With the exception of Lithuania which has two regions at Level 2; nonetheless, the same issue occurs in that these regions are too broad for the purposes of this research.

¹⁰ As such, the author will calculate the minority population in each of the 5 NUTS regions by adding the figures for each relevant county together – as specified through Statistics Estonia, 2015.

¹¹ For a detailed explanation of this process, please see Statistics Estonia (2019b).

¹² Unknown data refers to the cases in which ethnicity is either not stated or stated as not willing to disclose ethnicity etc.

¹³ Only available for Estonia and Lithuania

¹⁴ Only available for Estonia

¹⁵ Only available for Estonia

¹⁶ The exact years for each data set can be found in the OECD Regional Well-Being user guide (OECD, 2019, p.15).

¹⁷ The reference metadata for each of the three Baltic states can be viewed through on the Eurostat portal: https://ec.europa.eu/eurostat/cache/metadata/en/cens_11r_esmscs.htm

¹⁸ As can be observed in Appendix V and Figure 3.2.2, Riga is the best performing region in Latvia for all categories except for Employment and Unemployment where it is a close second and the homicide rate where it performs second worst.

¹⁹ Using total percentage of minorities as the x variable and including all regions in all 3 Baltic states.



Appendices

Appendix I: Estonia Population by Ethnicity and Region

NUTS Region Code	Region	Total Population	Estonian (%)	Russian (%)	Ukrainian (%)	Belorussian (%)	Other (%)	Unknown (%)	Total Minorities %
EE001	Northern Estonia	566,741	346,320 (61.11%)	177,694 (31.35%)	14,855 (2.62%)	7,860 (1.39%)	16,458 (2.90%)	3,554 (0.63%)	38.27%
EE004	Western Estonia	149,577	136,260 (91.10%)	9,337 (6.24%)	1,292 (0.86%)	363 (0.24%)	1,882 (1.26%)	443 (0.30%)	8.61%
EE006	Central Estonia	127,861	115,537 (90.36%)	8,216 (6.43%)	1,288 (1.01%)	416 (0.33%)	1,968 (1.54%)	436 (0.34%)	9.30%
EE007	Northeastern Estonia	153,716	29,704 (19.32%)	111,277 (72.39%)	3,494 (2.27%)	3,509 (2.28%)	5,069 (3.30%)	663 (0.43%)	80.24%
EE008	Southern Estonia	327,322	289,254 (88.37%)	28,743 (8.78%)	2,356 (0.72%)	808 (0.25%)	5,123 (1.57%)	1,038 (0.32%)	11.31%
EE00	Estonia (Total)	1,325,217	917,075 (69.2%)	335,267 (25.30%)	23,285 (1.76%)	12,956 (0.98%)	30,500 (2.30%)	6,134 (0.46%)	30.34%



Appendix II: Regional Development Indicators for Estonia

			Eurostat NUTS data	OECD Regional Well-Being Indicators: Topic ranked by points score out of 10, with relevant statistical data in brackets										
NUTS Region Code	Region	Total Minorities %	GDP % of EU 28 average	Access to Services (Households broadband access)	Civic Engagement (Voter turnout)	Education (Share of labour force with at least secondary education)	Jobs (Employment rate)	Jobs (Unemployment rate)	Community (Perceived Social support network)	Environment (Average level of PM2.5 in the region experienced by the population)	Health (Mortality Rate)	Health (Life Expectancy)	Safety (Homicide Rate)	Life Satisfaction (Life Satisfaction Index 0 to 10)
EE001	Northern Estonia	38.27%	111.0%	8.7 (89.6%)	5.6 (69.1%)	9.7 (93.4%)	9.2 (77.4%)	9.2 (5.2%)	7.5 (90.5%)	8.6 (6.7 µg/m³)	4.7 (8.7 / 1,000)	4.7 (78.7 years)	6.7 (3.1 / 100,000)	1.1 (5.4)
EE004	Western Estonia	8.61%	49.0%	7.9 (85.1%)	3.9 (60.5%)	8.6 (87.3%)	6.8 (68.5%)	6.8 (8.5%)	5.3 (85.0%)	8.2 (7.5 µg/m³)	3.3 (9.6 / 1,000)	3.3 (77.8 years)	4.7 (4.7 / 100,000)	1.1 (5.4)
EE006	Central Estonia	9.30%	45.0%	7.9 (85.1%)	4.0 (61.0%)	8.0 (83.7%)	7.3 (68.5%)	7.3 (6.7%)	7.7 (91.2%)	8.4 (7.1 µg/m³)	2.5 (10.1 / 1,000)	2.5 (77.1 years)	9.5 (0.8 / 100,000)	2.2 (5.7)
EE007	Northeastern Estonia	80.24%	42.0%	7.3 (81.2%)	2.7 (55.0%)	9.5 (92.2%)	4.6 (59.7%)	4.6 (11.3%)	3.8 (81.4%)	7.9 (8.1 µg/m³)	0.6 (10.9 / 1,000)	0.6 (75.0 years)	4.6 (4.8 / 100,000)	0.4 (5.2)
EE008	Southern Estonia	11.31%	55.0%	8.1 (86.2%)	4.3 (62.7%)	9.1 (90.3%)	7.9 (69.1%)	7.9 (5.0%)	6.1 (87.0%)	7.6 (9.0 µg/m³)	3.5 (9.4 / 1,000)	3.5 (77.8 years)	6.2 (3.5 / 100,000)	1.5 (5.5)



Appendix III: Bivariate Regression Analysis Estonia:

Dependent Variable Indicators	Coefficient & T-Statistic	R²
GDP % of EU 28	0.041 (0.08)	0.00
Households broadband access	-0.047 (-0.95)	0.23
Voter turnout	-0.067 (-0.76)	0.16
Share of labour force with at least secondary education	0.084 (1.51)	0.43
Employment rate	-0.992 (-0.97)	0.23
Unemployment rate	0.056 (1.51)	0.43
Perceived social support network	-0.077 (-1.28)	0.35
Average level of PM2.5 in the region experienced by population	0.109 (0.07)	0.00
Mortality rate	1.34 (1.02)	0.25
Life expectancy	-3.133 (-1.67)	0.48
Homicide rate	2.403 (0.89)	0.21
Life satisfaction index	-0.471 (-2.32) **	0.64

Notes: Significance stars are as follows: 90% = *, 95% = **, 99% = ***

Source: Data from Appendices I and II.



Appendix IV: Latvia Population by Ethnicity and Region

NUTS Region Code	Region	Total Population	Latvian (%)	Russian (%)	Belorussian (%)	Ukrainian (%)	Polish (%)	Lithuanian (%)	Other (%)	Unspecified / unknown (%)	Total Minorities %
LV003	Kurzeme	270,498	205,150 (75.84%)	39,834 (14.73%)	5,484 (2.03%)	6,709 (2.48%)	1,823 (0.67%)	6,983 (2.58%)	4,318 (1.60%)	197	24.09%
LV005	Latgale	304,032	139,941 (46.03%)	118,170 (38.87%)	15,046 (4.95%)	3,845 (1.26%)	20,806 (6.84%)	1,745 (0.57%)	3,312(1.09%)	1,167	53.59%
LV006	Riga	658,640	305,117 (46.33%)	264,808 (40.21%)	25,535 (3.88%)	22,737 (3.45%)	12,208 (1.85%)	5,450 (0.83%)	18,044 (2.74%)	4,741	52.95%
LV007	Pieriga	371,431	269,177 (72.47%)	71,665 (19.29%)	9,702 (2.61%)	6,408 (1.73%)	4,510 (1.21%)	2,921 (0.79%)	5,688 (1.53%)	1,360	27.16%
LV008	Vidzeme	211,309	184,134 (87.14%)	18,540 (8.77%)	2,745 (1.30%)	1,762 (0.83%)	1,397 (0.66%)	756 (0.36%)	1,876 (0.89%)	99	12.81%
LV009	Zemgale	254,461	181,617 (71.37%)	44,102 (17.33%)	9,690 (3.81%)	4,337 (1.70%)	4,028 (1.58%)	6,624 (2.60%)	3,429 (1.35%)	634	28.38%
LV00	Latvia (Total)	2,070,371	1,285,136 (62.07%)	557,119 (26.91%)	68,202 (3.29%)	45,798 (2.21%)	44,772 (2.16%)	24,479 (1.18%)	36,667 (1.77%)	8,198	37.53%



Appendix V: Regional Development Indicators for Latvia

			Eurostat NUTS data	OECD Regional Well-Being Indicators: Topic ranked by points score out of 10, with relevant statistical data in brackets							
NUTS Region Code	Region	Total Minorities %	GDP % of EU 28 average	Access to Services (Households broadband access)	Civic Engagement (Voter turnout)	Jobs (Employment rate)	Jobs (Unemployment rate)	Environment (Average level of PM2.5 in the region experienced by the population)	Health (Mortality Rate)	Health (Life Expectancy)	Safety (Homicide Rate)
LV003	Kurzeme	24.09%	48.0%	5.4 (69.7%)	3.4 (58.4%)	5.4 (63.8%)	5.4 (10.8%)	6.9 (10.5 µg/m³)	0.2 (12.2 / 1,000)	0.2 (74.9 years)	7.0 (2.8 / 100,000)
LV005	Latgale	53.59%	33.0%	5.2 (68.0%)	1.1 (47.0%)	2.2 (57.6%)	2.2 (18.9%)	6.1 (12.1 µg/m³)	0 (13.3 / 1,000)	0 (72.2 years)	5.7 (3.9 / 100,000)
LV006	Riga	52.95%	106.0%	7.1 (79.7%)	5.7 (69.7%)	7.7 (72.1%)	7.7 (7.5%)	6.1 (12.2 µg/m³)	1.2 (10.6 / 1,000)	1.2 (75.6 years)	3.7 (5.5 / 100,000)
LV007	Pieriga	27.16%	53.0%	6.8 (78.0%)	4.7 (64.5%)	7.9 (70.7%)	7.9 (5.9%)	6.5 (11.2 µg/m³)	1.0 (10.8 / 1,000)	1.0 (75.6 years)	5.8 (3.8 / 100,000)
LV008	Vidzeme	12.81%	42.0%	5.5 (70.3%)	3.8 (60.1%)	5.3 (64.6%)	5.3 (11.8%)	6.5 (11.4 µg/m³)	0 (11.7 / 1,000)	0 (74.1 years)	3.6 (5.6 / 100,000)
LV009	Zemgale	28.38%	40.0%	5.6 (70.8%)	2.8 (55.5%)	5.5 (65.2%)	5.5 (11.5%)	6.0 (12.3 µg/m³)	0 (12.2 / 1,000)	0 (74.0 years)	5.9 (3.7 / 100,000)



Appendix VI: Bivariate Regression Analysis – Latvia

Dependent Variable Indicators	Coefficient & T-Statistic	R²
GDP % of EU 28	0.713 (0.98)	0.19
Households broadband access	0.070 (0.49)	0.06
Voter turnout	-0.049 (-0.21)	0.01
Employment rate	-0.020 (-0.12)	0.00
Unemployment rate	0.078 (0.59)	0.08
Average level of PM2.5 in the region experienced by population	2.579 (1.51)	0.36
Mortality rate	0.688 (0.23)	0.01
Life expectancy	-1.826 (-0.48)	0.06
Homicide rate	0.630 (0.19)	0.01

Notes: Significance stars are as follows: 90% = *, 95% = **, 99% = ***

Source: Data from Appendices IV and V.



Appendix VII: Lithuania Population by Ethnicity and Region

NUTS Region Code	Region	Total Population	Lithuanian (%)	Polish (%)	Russian (%)	Belorussian (%)	Ukrainian (%)	Other (%)	Not Indicated	Total Minorities %
LT011	Vilniaus	810,403	481,453 (59.41%)	186,192 (22.98%)	83,281 (10.28%)	26,672 (3.29%)	1,823 (0.67%)	6,983 (2.58%)	17,178	38.47%
LT021	Alytaus	157,766	150,349 (95.30%)	3,029 (1.92%)	1,973 (1.25%)	668 (0.42%)	275 (0.17%)	734 (0.47%)	738 (0.47%)	4.23%
LT022	Kauno	608,332	574,096 (94.37%)	2,812 (0.46%)	19,784 (3.25%)	1,454 (0.24%)	2,075 (0.34%)	2,694 (0.44%)	5,417 (0.89%)	4.74%
LT023	Klaipėdos	339,062	290,369 (85.64%)	748 (0.22%)	35,265 (10.40%)	2,982 (0.88%)	3,542 (1.04%)	2,824 (0.83%)	3,332 (0.98%)	13.38%
LT024	Marijampolės	161,649	158,532 (98.07%)	277 (0.17%)	1,099 (0.68%)	188 (0.12%)	181 (0.11%)	564 (0.35%)	808 (0.50%)	1.43%
LT025	Panevezio	250,390	241,329 (96.38%)	513 (0.20%)	5,660 (2.26%)	376 (0.15%)	601 (0.24%)	732 (0.29%)	1,179 (0.47%)	3.15%
LT026	Siauliai	301,686	288,616 (95.67%)	429 (0.14%)	8,039 (2.66%)	660 (0.22%)	925 (0.31%)	1,382 (0.46%)	1,635 (0.54%)	3.79%
LT027	Tauragės	110,059	108,238 (98.35%)	69 (0.06%)	723 (0.66%)	93 (0.08%)	133 (0.12%)	247 (0.22%)	556 (0.51%)	1.15%
LT028	Telsiai	152,078	148,072 (97.37%)	122 (0.08%)	2,184 (1.44%)	252 (0.17%)	242 (0.16%)	421 (0.28%)	785 (0.52%)	2.12%
LT029	Utenos	152,004	120,260 (79.12%)	6,126 (4.03%)	18,905 (12.44%)	2,882 (1.90%)	1,452 (0.96%)	1,029 (0.68%)	1,350 (0.89%)	20.00%
LT00	Lithuania (Total)	3,043,429	2,561,314 (84.16%)	200,317 (6.58%)	176,913 (5.81%)	36,227 (1.19%)	16,423 (0.54%)	19,257 (0.63%)	32,978 (1.08%)	14.76%



Appendix VIII: Regional Development Indicators for Lithuania

			Eurostat data	OECD Regional Well-Being Indicators: Topic ranked by points score out of 10, with relevant statistical data in brackets								
NUTS Region Code	Region	Total Minorities %	GDP % of EU 28 average	Access to Services (Households broadband access)	Civic Engagement (Voter turnout)	Education (Share of labour force with at least secondary education)	Jobs (Employment rate)	Jobs (Unemployment rate)	Environment (Average level of PM2.5 in the region experienced by the population)	Health (Mortality Rate)	Health (Life Expectancy)	Safety (Homicide Rate)
LT011	Vilniaus	38.47%	109.0%	5.0 (66.9%)	2.0 (51.6%)	10.0 (96.8%)	7.4 (70.4%)	7.4 (7.7%)	5.7 (12.9 µg/m³)	0.4 (11.2 / 1,000)	0.4 (75.1 years)	5.2 (4.3 / 100,000)
LT021	Alytaus	4.23%	47.0%	4.6 (64.6%)	2.9 (56.1%)	10.0 (95.7%)	3.8 (62.0%)	3.8 (15.7%)	4.1 (16.4 µg/m³)	0.1 (11.2 / 1,000)	0.1 (74.3 years)	3.0 (6.1 / 100,000)
LT022	Kauno	4.74%	76.0%	6.1 (73.9%)	1.0 (46.8%)	10.0 (96.8%)	7.3 (69.5%)	7.3 (7.3%)	4.6 (15.5 µg/m³)	0.5 (11.1 / 1,000)	0.5 (75.2 years)	3.1 (6.0 / 100,000)
LT023	Klaipėdos	13.38%	77.0%	5.1 (67.4%)	0.0 (40.7%)	9.9 (94.9%)	8.3 (73.4%)	8.3 (6.2%)	5.6 (13.3 µg/m³)	0.6 (11.1 / 1,000)	0.6 (75.3 years)	3.0 (6.1 / 100,000)
LT024	Marijampolės	1.43%	45.0%	4.4 (63.5%)	0.3 (43.2%)	9.6 (93.3%)	5.3 (63.0%)	5.3 (10.6%)	4.5 (15.7 µg/m³)	0.0 (11.6 / 1,000)	0.0 (73.9 years)	0.0 (10.0 / 100,000)
LT025	Panaevėžio	3.15%	56.0%	5.5 (70.0%)	0.2 (42.6%)	9.4 (91.7%)	4.9 (63.1%)	4.9 (12.2%)	5.6 (13.2 µg/m³)	0.0 (11.6 / 1,000)	0.0 (74.5 years)	4.7 (4.7 / 100,000)
LT026	Siauliu	3.79%	57.0%	4.1 (61.2%)	0.5 (44.0%)	9.3 (91.3%)	4.1 (59.9%)	4.1 (13.4%)	5.8 (12.7 µg/m³)	0.0 (11.5 / 1,000)	0.0 (74.0 years)	1.6 (7.2 / 100,000)
LT027	Tauragės	1.15%	41.0%	4.3 (62.8%)	2.0 (51.6%)	8.8 (88.5%)	5.6 (62.4%)	5.6 (9.2%)	N/A	0.0 (12.6 / 1,000)	0.0 (73.3 years)	4.4 (4.9 / 100,000)
LT028	Telsių	2.12%	53.0%	5.5 (69.8%)	0.0 (40.5%)	9.4 (91.8%)	5.9 (65.8%)	5.9 (10.4%)	5.3 (14.0 µg/m³)	0.4 (11.0 / 1,000)	0.4 (74.8 years)	2.7 (6.3 / 100,000)
LT029	Utenos	20.0%	47.0%	3.9 (60.4%)	2.1 (51.8%)	9.7 (93.8%)	4.2 (62.1%)	4.2 (14.20%)	6.1 (12.2 µg/m³)	0.0 (12.6 / 1,000)	0.0 (73.1 years)	2.5 (6.5 / 100,000)



Appendix IX: Bivariate Regression Analysis – Lithuania

Dependent Variable Indicators	Coefficient & T-Statistic	R²
GDP % of EU 28	1.345 (3.37) ***	0.59
Households broadband access	-0.029 (0.22)	0.01
Voter turnout	0.154 (1.00)	0.11
Share of labour force with at least secondary education	0.122 (1.84) *	0.30
Employment rate	0.177 (1.53)	0.23
Unemployment rate	-0.068 (-0.75)	0.07
Average level of PM2.5 in the region experienced by population	-6.182 (-1.54)	0.25
Mortality rate	-0.158 (-0.09)	0.00
Life expectancy	1.459 (0.65)	0.05
Homicide rate	-5.289 (-1.21)	0.15

Notes: Significance stars are as follows: 90%=*, 95%=**, 99%=***

Source: Data from Appendices VII and VIII.



Appendix X: Bivariate Regression Analysis – Comparative across Baltics

Dependent Variable Indicators	Coefficient & T-Statistic	R²
GDP % of EU 28	0.253 (1.03)	0.05
Households broadband access	0.133 (1.47)	0.10
Voter turnout	0.156 (1.72) *	0.13
Employment rate	0.001 (0.02)	0.00
Unemployment rate	0.013 (0.32)	0.01
Average level of PM2.5 in the region experienced by population	-5.022 (-1.74) *	0.14
Mortality rate	-0.009 (-0.01)	0.00
Life expectancy	0.043 (0.02)	0.00
Homicide rate	-2.589 (1.33)	0.08

Notes: Significance stars are as follows: 90%=*, 95%** , 99%***

Source: Data from Appendices I,II,IV,V,VI and VIII.

Appendix XI: Bivariate Regression Analysis – Comparative across Baltics (omitting capital city regions)

Dependent Variable Indicators	Coefficient & T-Statistic	R²
GDP % of EU 28	- 0.216 (-1.70) *	0.15
Households broadband access	0.099 (1.01)	0.06
Voter turnout	0.081 (0.84)	0.04
Employment rate	-0.074 (-1.53)	0.12
Unemployment rate	0.049 (1.16)	0.07
Average level of PM2.5 in the region experienced by population		
Mortality rate	1.006 (0.82)	0.04
Life expectancy	-1.286 (0.71)	0.03
Homicide rate	-2.788 (-1.21)	0.08

Notes: Significance stars are as follows: 90%=*, 95%** , 99%***

Source: Data from Appendices I,II,IV,V,VI and VIII.



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