Measuring Human Development at the Local Level: A Case Study of Latvia

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Abstract

The Human Development Index was elaborated in 1990 and has been subsequently included in annual Human Development Reports published by United Nations Development Programme (UNDP). However, the Human Development Index value can hide regional differences within a country in terms of how equally human development is spread across the country. The aim of the study is to use Latvia as a case study to develop a methodology and calculate a local human development index. The local human development index will analyze development differences between each of the 119 local municipalities of Latvia in order to understand and explain the variance between them. I argue that this variation stems from level of economic development and distance to capital city Riga. The results reveal that there are considerable regional differences, with capital city of Riga being the most developed compared to the eastern part of Latvia.

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Introduction

Statement of the problem

The Human Development Index (HDI) was first published in 1990 and has been subsequently included in global annual Human Development Reports (HDR) produced by the United Nations Development Programme (UNDP). The HDI is a composite indicator which has undergone many revisions. It currently consists of four indicators capturing; a long and healthy life, being educated and having a decent standard of living (see image below). Its scale of measurement is from 0 to 1. Values close to 1 signifying a very high human development whereas values closer to 0 a lower level of human development.

Since the fisrt publication of the HDI, in 1990, HDR remain the official framework for communicating the results of annual calculations. This is despite the fact that nowadays HDI time series with the supporting documentation are constantly made available online¹. HDI calculations and communication of results are commonly presented at the country level or aggregated at the regional level, for instance; Europe or Central Asia.

However, does a depiction of a particular level of human development in a country as a uniform entity mean the same across households, gender, ethnic groups, regions or local municipalities? Surely, this is not the case in reality. The problem stems from the application of the index creating a "representative individual", meaning it is assumed that "this representative adult has no occupation, no sex, and lives everywhere in the country" (Ivanov and Peleah 2011, 4). Thus the problem can be framed as follows: the HDI value annually calculated and included in the global HDR puts a "label" on a country. For instance, Latvia is characterized as having "a very high human development level" having HDI value of 0.810 and rank of 48 (UNDP 2014). However, in reality, even a simple measure of regional gross domestic product (GDP), which

¹ Human Development Index, UNDP <u>http://hdr.undp.org/en/content/human-development-index-hdi</u>

is commonly used to determine the level of development, indicates considerable regional differences. According to latest data from 2011, Riga, the capital city, contributes 50% to the country's total GDP while the other six regions contribute between the range of 6.8% and 14.8%.² With this in mind and applied in the context of the human development index, it is clear to see how a distorted perception can be created.

In fact, it should not be forgotten that the HDR is a voluntary project of the UNDP and is in no way binding to the UN member states. In the words of the UN General Assembly, the HDR "is a separate and distinct exercise which is not an official document of the United Nations"³. In a nutshell it means that the HDR and its content, including HDI, should be treated as an intellectual and awareness raising contribution to human development studies on a global level. Thus any extra studies which go beyond global problems and comparisons are welcomed.

The purpose of the study

Unpacking human development in terms of going beyond global annual HDRs has a long history. Records show that between 1992 and 2010 more than 650 national and sub-national HDRs, and 37 regional HDRs have been produced. These reports describe different aspects of human development within national and local contexts, often expounding on topics neglected in global HDRs. The concept of human development has been expanded across six dimensions.⁴ One of them is the national application of human development measurement also known as the development of local human development indexes (Pagliani 2010). In a similar study that examined national and regional human development reports for the time period

² Data of Central Statistical Bureau of Latvia: <u>http://www.csb.gov.lv/en</u>

³ UN General Assembly resolution No. 49/123 of 19 December 1994:

http://www.un.org/documents/ga/res/49/a49r123.htm

⁴ Others being a) Adaptation and evolution of the human development approach; b) Contribution to capacity development; c) Revision of national policies and fund allocations to reflect human development priorities and the needs of the poorest and excluded groups; d) Prominent media coverage on human development issues; e) Establishment of national human development networks and people-centred curricula

1998-2009, the authors found that disaggregation of the HDI for subnational units is one of the five common themes found in these reports (Gaye and Jha 2010).

Since 1995, Latvia has produced twelve national human development reports for the UNDP. Of the twelve, only one has focused on human development in Latvian regions (UNDP 2005). The purpose of the study is to contribute to the literature on how to fill this gap. Using the case of Latvia, the aim is to identify how to best disaggregate the human development index so that it could be calculated at the local level. It has been emphasized that "using disaggregated HDIs at the national and sub-national levels helps highlight the significant disparities among various groups across regions, between the sexes, urban and rural areas and among ethnic groups" (Gaye and Jha 2010, 25). Thus essentially the study entails developing a methodology to calculate the human development index for each of the 119 local municipalities of Latvia in order to understand such differences. In terms of methodology, the study aims to understand whether a local human development index should include the same indicators and computation methodology applied to calculate the index for countries published as in global human development report.

Human development index and its disaggregation – literature review

Building on individual opportunities or freedoms to choose how to live, Sen describes the human development approach as a proposal to shift from a means based perspective where wealth or resources are of main importance, and where even humans themselves are treated as factors of production, to an ends based perspective, meaning that wealth is not the ultimate end (Sen 2009, 226). He emphasizes that in terms of capabilities, political liberties, social facilities, good health, and basic education are of equal importance (Sen 2001). The very first HDR embraced this notion by coming up with a definition of human development that underlined that essentially it is a process of enlarging people's choices through long and healthy lives, education and a decent standard of living (UNDP 1990).

HDI tries to capture this approach to measure human development in a very simplistic way offering three dimensions of health, education and income that are aggregated in a composite indicator (see figure 1). However, the human development index has undergone several changes and improvements over the last 20 years. It is beyond the scope of this study to discuss its vast academic and policy contribution. In particular, how the human development should be measured and why the initial proposal for HDI had to be improved. Moreover, a study commissioned by the UNDP shows that as of 2014, 101 composite indicators have been developed by international organizations, national governments, non-governmental organizations (NGOs), civil societies, private consultancies and universities capturing human development and their various aspects (Yang 2014). The following points give just a condensed insight into the most important changes surrounding the calculation of the HDI.



Figure 1: Current Human Development Index and its Components

Source: Adopted by the author from (UNDP 2013)

In figure 1 above the HDI is broken down to illustrate its dimensions and indicators. As mentioned earlier, there are three dimensions; knowledge, decent standard of living as well as a long and healthy life. Under each dimension is the indicator currently used to measure these dimensions. For example, the indicator for decent standard of living is the gross national income (GNI) per capita.

Table 1 summarizes the changes in HDI as follows:

- a) in terms of indicators, major changes involve how to measure education and income, and there has been relative agreement how to measure human health;
- b) there have been different approaches regarding how to weigh indicators: prior to 2010 indicators were weighed differently, starting from 2010 all indicators are weighed equally;
- c) in terms of normalization of indicators min-max approach has been used. However there have been disputes whether to fix (preferable value according to assumptions) or just use observed minimal and maximal values of indicators;
- d) there has been shift in method of aggregation to compute composite index. Prior to 2010 a simple arithmetic mean was used, whereas starting from 2010 the geometric mean replaced it.

| HDR | Bounds | Indicators | | Treatment of income | Aggregation | |
|------------------------|--|--|--|---|--|--------------------|
| | | Health | Education | Income | | formula |
| 1990 | Observed | Life expectancy at birth (UN Population Division) | Adult literacy rate (25+) (UNESCO) | Real GDP per capita PPP \$ (log) (World Bank) | Logarithmic transformation with a cap | Arithmetic mean |
| 1991- 1993 | | | (2/3) Adult literacy rate(UNESCO)(1/3) Mean years of schooling(UNESCO) | Real GDP per capita PPP \$ (adjusted) (World Bank) | Atkinson formula with threshold value derived from poverty line | |
| 1994 | Fixed | | (2/3) Adult literacy index(UNESCO);(1/3) Mean years of schooling(UNESCO) | | Atkinson formula with threshold value derived from global average | |
| 1995- 1998 | | | (2/3) Adult literacy rate index(UNESCO); (1/3) Combined gross enrolment ratio index with a cap starting to bind in 1996 (UNESCO) | | | |
| 1999; 2000- 2009 | | | (2/3) Adult literacy rate index (15+) (UNESCO); (1/3) Combined gross enrolment ratio index with a cap starting to bind in 1996 (UNESCO) | Real GDP per capita PPP \$ (log) (World Bank) | Logarithmic transformation with a cap starting to bind in 2001 | |
| 2010 | Upper: observed; Lower: fixed | | (1/2) Mean years of schooling index (Barro-Lee); (1/2) Expected years of schooling index (UNESCO) | Real GDI per capita PPP \$ (In) (World Bank) | Natural logarithmic without a cap | Geometric mean |

 Table 1: Changes to the Human Development Index, 1990–2010

Source: Adopted by the author from (Klugman, Rodríguez, and Choi 2011, 253)

As it can be seen, 2010 marks a major shift in how the HDI is calculated. Scholars argue that even though there is still room for improvement, the new HDI is a huge step forward addressing the shortcomings of the old HDI (Zambrano 2014). However, one cannot be rest assured that because of these changes the debate has ended. There are already proposals for improving the existing 2010 HDI. See for example (Ravallion 2012), (Herrero, Martínez, and Villar 2012) and (Hou, Walsh, and Zhang 2014). 2010 also marks a major change in disaggregation of the HDI. This is because three new indexes were introduced: inequality-adjusted human development index, gender inequality index, and a multidimensional poverty index.

These shifts are a response to a long debate about the shortcomings of human development index. Overall there are two major criticisms – the human development index misses other possibly important dimensions of human development. For example, measures of political freedom or the level of safety in the environment where people live. Secondly, a lot of criticism is directed towards how the human development index is computed. Specifically, there is a mix

of inputs and outputs. This means that for example GDP or GNI is more an input, but the condition of human health is an output which is partly result of level of GDP. Therefore, indicators factored into the human development index have interdependent relationships. In addition, there is also a mix of stocks and flows, for example, adult literacy rate is a stock indicator which accumulates and is measured at particular moment, whereas gross enrolment ratio is a flow indicator measured over a period of time. These criticisms and the comprehensive history of human development index and other critiques are well summarized by (Klugman, Rodríguez, and Choi 2011) and (Kovacevic 2010).

However, besides proposing new dimensions for human development index and having methodological inputs, a stream of scholars propose to disaggregate the human development index by subnational units. "(...) Disaggregated HDIs are arrived at by using the data for the HDI components pertaining to each of these groups into which the HDI is disaggregated, treating each group as if it were a separate country" (UNDP 1993, 103). Such subgroups can be geographical or administrative regions, urban-rural residence, gender and ethnicity. The limit of disaggregation is reached if one can calculate the HDI for each individual in a country (Akder 1994): see also Table 2 below. This means that Human Development Index can be calculated for each of these groups. In fact, it can work in the opposite way as well, because the annual Human Development Reports together with country specific HDI values also include aggregated Human Development Indexes for larger regions such as Europe, South Asia, etc.

For the purposes of my research I am interested in focusing on the human development index at the regional and municipal level. It is essentially a human development index calculated for municipalities. Nevertheless it is worth mentioning that scholars who focus on other subgroups can touch upon this territorial dimension as well. For example, the human development index calculated for households can include additional components, such as where a household is located – in an urban or rural area. This can reveal additional valuable information as well as going a step further to divide households into income groups, as it is usually done (Harttgen and Klasen 2012). The approach centered on the urban rural divide is used to analyze migration flows in the context of the human development index as well (Harttgen and Klasen 2011).

| Dimension | Group |
|----------------------------|---|
| Spatial dimensions | National |
| | Regional |
| | Provincial / county |
| | Municipality |
| | Urban / small town / rural |
| | Urban slum / non-slum |
| Income | Wealth quintile |
| | Poorest quintile |
| | Poverty line (above / below) |
| Employement | Sector (agriculture, industry, services) |
| | Status (formal, informal, full-time, part-time, |
| | seasonal) |
| Individual characteristics | Sex |
| | Age group |
| | Ethnic group |
| | Migrant / non-migrant |
| Education | Attainmnet (primary sdchool, secondary school, |
| | university) |
| | Literacy |
| Other dimensions | Conflict-prone areas |
| | Economic classes requiring special policy |
| | guidance |
| | At-risk groups |

Table 2: Dimensions of possible HDI disaggregation

Source: Adopted by the author from (Ivanov and Peleah 2011, 5)

The regional level of disaggregation of the human development index can be traced back to the early 1990s. Akder refers to several background papers which were prepared for Human Development Reports and which document Human Development Indexes calculated for regions of China, Nigeria, Poland, and Gabon. Each of these studies demonstrate that disparities between regions exist and that the disaggregation method helps to reveal them (Akder 1994). Recent research attempts which cover a broader range of countries have been

very well documented by Ivanov and Peleah. They examine national HDRs and have provided a comparative perspective (Ivanov and Peleah 2011).

Moreover, one can also mention the development of territorial human development indexes for Austria (Schrott, Gächter, and Theurl 2012), Portugal (Silva and Ferreira-Lopes 2014), the United States (Porter and Purser 2008), Iran (Asma Sabermahani 2013), Mexico (Permanyer 2013), Egypt (Ali 2010), China (Xiao, Gu, and Huang 2012) and various African countries (Permanyer et al. 2014). In fact, it is interesting to note that using NUTS II region level data, there has also been an attempt by the European Commission to calculate a regional human development index for the entire European Union (Bubbico and Dijkstra, n.d.). Even though the idea of regional human development index is clear, it is of particular importance how it is computed and whether the regional human development index entails the same indicators and computation methodology as it is currently applied to calculate the national-level index. Every subsequent attempt to introduce regional human development indexes reveals different approaches. The following section will give several examples.

For the Human development index for the NUTS III⁵ Portugal regions (Silva and Ferreira-Lopes 2014), the authors have taken into account various criticisms and added two more dimensions to capture human development, namely governance and environment. Governance is measured as participation rate in elections (%) and environment as the percentage of population served by waste water treatment stations (%). There was one more slight addition in terms of indicators. Due to data availability, education was covered using different indicator: secondary school completion rate (%). In terms of education an interesting approach has been used in the Austrian case where it was claimed that for advanced countries more sophisticated

⁵ In this case regions mean NUTS III regions which are established according to common territorial classification applied for the whole European Union, NUTS regional classification encompass NUTS 0 (state), NUTS I (3 million to 7 million inhabitants), NUTS II (800 000 to 3 million inhabitants) and NUTS III (150 000 to 800 000 inhabitants)

indicator (education attainment level) is necessary to capture the educational component, as enrollment level is not of much help (Schrott, Gächter, and Theurl 2012). As far as computational methodology is concerned for the Portugal case, the 2010 HDI methodology was applied. The results reveal that there are significant regional disparities, and that the capital region of Lisbon clearly dominates.

A highly interesting approach applies the human development index methodology to the Unites States where regional human development indexes were calculated for counties (Porter and Purser 2008);(Porter 2008). As the study took place prior to 2010, the old methodology of human development index was used with slight changes (for example, by substituting the indicator measuring education with the one that measures the percent of individuals at the county level with a bachelor's degree). However, besides recalculations of the index, an analysis of geographic information system (GIS) using spatial autocorrelation was also applied to identify clusters of developed or underdeveloped counties. Such kind of analysis not only gives a sense of territorial differences, but also searches for explanations taking into account the influence of space, for example, the study identifies that one of the developed county clusters is formed due to influence of metro areas (Porter and Purser 2008).

There have also been attempts to construct regional human development indexes for local municipalities. The case of Mexico is particularly informative as the authors hold the view that it is not sound practice to attempt to replicate country level human development index for regions as there are problems of data availability and one has to make assumptions or deviate from original indicator. Instead, they argue that a completely new indicator should be chosen to capture dimensions of human development index better in a statistically reliable manner (Permanyer 2013). Moreover, they propose that census data (usually available every 10 years) is suitable for purposes of constructing such kind of composite indicators, as they fill data

availability gaps for territories and capture characteristics of households. In terms of new indicators for the health dimension they propose to use percentage of surviving children born to women between age 20 and 39, but for standard of living, to use an asset index, which on household level provide information about whether household has piped water, flush toilet, quality floors, quality walls, quality roof, electricity, radio, TV, refrigerator, phone, car. They choose to calculate the index using both methods – one established prior to 2010 and one after 2010. Results reveal significant differences between urban and rural areas for all years municipal human development indexes was calculated (1990, 2000, 2010), however, on country level Mexico had human development index values signifying high human development (Permanyer 2013).

There is no academic research done to conceptually summarize how the human development index is applied to territories within states, however UNDP has observed that there are three main approaches (UNDP Poland 2013). The first approach involves HDI being applied to subnational units as it is. This usually works for big countries like Russia and China, where local territories are large enough and data availability problem can be avoided. The second approach involves changes in indicators, while leaving the calculation methodology untouched. The third approach involves the development of new methodologies and indicators relevant to concept of human development, and this would be a case for Latvia.

The common underlying assumption here is that space and location matter in order to understand and explain various processes in society. Some seminal studies have sought to develop a whole research agenda about how to integrate the notion of space in social science, particularly concerning social inequality, health, criminal justice, community studies, and business development (Goodchild et al. 2000). My intention is to use the general theoretical concept which essentially presumes that including a spatial aspect in any social science study can reveal potentially new perspectives on how to think about problems. In other words, I argue that location matters. The main task of spatial science is to use spatial data analysis to determine whether processes are spatially determined (Goodchild and Janelle 2004). Given the findings described in research of Porter and Purser (2008), and also those of Ali (2010), spatial variation can be higly dependent on the presence of development centers like cities which attract more investment and human resources.

The role of the cities as drivers for regional economic growth have been well established in the literature. A study which looked at regional economic growth in Europe from 1995-2010 concluded that those regions which contain urban centers grow faster, moreover proximity to urban centers in general have positive impact for regional economic growth (Ahrend and Schumann 2014). Similar study shows the positive relationship between regional economic growth and the presence of the cities, moreover indicating growth spillover effect for neighboring regions, meaning that the presence of the city is not only important for particular region, but it can act as an driver for growth in larger neighboring area (Cuaresma and Feldkircher 2010). Other studies have also documented the above mentioned relationship, see (Cuaresma, Doppelhofer, and Feldkircher 2014; Polese 2011), particularly in Latvia as well, see (Zaluksne 2014; Haite 2013).

Obviously if a city acts as a driver for regional development then it also has an impact on the level human development. The relationship has not been examined in detail, the focus has been more on the inquiries about the level of human development particularly in cities themselves, not touching upon what role cities play in fostering human development in surrounding region or regions, see example of local human development index for cities in (Agostini and Richardson 1997). However, research indicates that not surprisingly human development level in cities is higher than in the rest of the country, see figure 2. It means that those areas which include cities should have higher level of human development compared to the rest.



Figure 2: City and National Human Development Index comparison, 2012

Source: Adopted by the author from (Habitat 2013, 18)

When it comes to other determinants or explanatory factors of human development which go beyond space and locality, the researchers have put forward various explanations, although all of them focus on explaining variation of human development at the national level. A good overview capturing also many technical approaches of how to explain human development can be found in (Eren, Çelik, and Kubat 2014), the following outlines key explanatory factors. It has been found by Islam in a cross-national study that level of economic development can explain variation in human development across countries, particularly if one looks at the GDP (Islam 1995). A similar study which employed a panel of 84 countries from 1970 to 2005 has shown that macroeconomic policies which have impact on GDP have less impact on Human Development Index, it is noted that "HDI development policies should look beyond the realm of GDP development policies" (Binder and Georgiadis 2010). It means that other factors as well have good explanatory power being determinants of human development. Most notably scholars have pointed out that institutions have positive impact on the human development, see (Terzi, Trezzini, and Moroni 2013; Vollmer and Ziegler 2009), which is unsurprising given the well-known established link by Acemoglu and Robinson who argue that institutions matter for economic development (Acemoglu, Johnson, and Robinson 2001), thus this inevitably has an impact on human development as well. In this framework the authors are more concerned with the quality of institutions, for instance whether they can perform and secure preconditions for economic development. It means that such factor as administrative capacity is crucial, because it enables for institutions to perform at all, administrative capacity in turn is related to available resources, especially at the local level. It has been shown that financial capacity of institutions has a positive impact on human development (Simanjuntak and Mukhlis 2014).

It has to be mentioned that studies show that other factors as well positively correlate with the level of human development. For instance a study looking at cross country data from 41 countries in Sub-Saharan Africa shows that extent of conflicts, occurrence of natural disasters, access to water and the prevalence of HIV/AIDS have an impact besides above mentioned economic development and sound policies performed by well-functioning institutions (Adeyemi et al. 2006). Also see (Biagi, Ladu, and Royuela 2015) for how tourism can have an impact on human development.

Research question and hypothesis

My research question aims to understand how different Latvian local municipalities are in terms of human development and why. The research questions stems from the above indicated problem that human development measures at the national level conceal territorial differences within a country. Thus it is relevant to inquire what is the extent of differences among local municipalities in Latvia and what are the potential causes and explanatory factors. Literature review, firstly, helps to understand how to approach measurement of human development at the local level and, secondly, several hypothesis can be put forward as to explain variation in human development at the local level.

The following are the resulting hypothesis I want to test stemming from the research question: It is important to verify factually whether there is any variation – obviously by default all local municipalities cannot be equal whatever the circumstances, however, the measurement of local human development should reveal a degree of variation.

(H1) There is spatial variation in human development across local municipalities of Latvia.

When it comes to explanatory factors it can be concluded from the literature review that cities play an important role in terms of regional development and also human development. Hence it can be assumed that the presence of city or several cities in local municipality has an effect on human development in a way that the cities attract resources and are hubs of development. (*H2*) *The spatial variation in human development is determined by urban centers because of a development clustering effect.*

Proximity to the major cities has also been mentioned as one of the potential explanatory factors when it comes to space and how it has an impact on territorial development. Development in Latvia is monocentric, meaning that capital city Riga attracts most of the investment and human resources. In terms of GDP Riga's contribution to national GDP is 50%, thus in many ways proximity to Riga is essential for economic development and opportunities.

(H3) The spatial variation in human development is determined by proximity to Riga in terms physical distance

I also want to test how institutions and specifically institutional capacity has an influence on human development. It is hard to measure administrative capacity at the local level due to data availability⁶, however, administrative capacity is closely linked to financial capacity and ability to perform. It not only affects performance, but also ability to apply for the European Union funding where one of the requirements is to share project costs.

(H4) The spatial variation in human development is determined by financial capacity of the local municipalities

It has been shown that the level of economic development has an impact on human development, thus I want to test to what extent economic development in local municipality determines human development.

(H5) The spatial variation in human development is determined by the level of economic development

⁶ Central Statistical Bureau carries out local government self-assessment by asking mayors of local municipalities to fill specially designed survey, which among other things asks to what extent local municipality can perform administratively, meaning sufficient human resources, equipment, etc. Unfortunately the data due to confidentiality is available only in aggregated form for regions only or for specific local municipality groups: http://www.csb.gov.lv/en/dati/e-publikacijas/self-assessement-local-governments-latvia-2013-only-latvian-38611.html

Measuring human development at the local level in Latvia

One study has aimed to employ the HDI methodology to calculate HDI for regions of Latvia. However during the study it was concluded that due to lack of relevant statistics it is not possible to calculate the HDI. Thus the author chose close variable proxies and performed a basic ranking of regions. It was concluded that Riga region ranks first in terms of human development (Ozola 2006). Thus far, measurements of development in a form of a composite indicator have been confined to measuring territorial development, which means capturing a little bit of everything - human development, well-being and sustainable development. In other words it means going beyond human development and looking also at factors which are more related for instance to a development of a territory, e.g. natural resources, accessibility, innovation and science, investment.

It is worth noting that there are several composite indicators. At the regional level (6 NUTS III regions) the oldest one was elaborated in 2000 by Statistical Institute of Latvia and is composed of 8 indicators (Vanags and Krastiņš 2004). More recent contribution include a composite indicator with 11 indicators focusing on regional development in general (Vesperis 2012), composite indicators that also touch on the aspect of economic competitiveness with 42 indicators (see Judrupa 2011) and 27 indicators (see Racko 2013). Measurements of development at the local municipality level follow the same pattern as in regions – there is emphasis on measuring territorial development which incorporates aspects of human development and quality of life. The following section introduces the four composite indicators which have been elaborated thus far in Latvia.

The territorial development index was elaborated in 2000 by Statistical Institute of Latvia and has been calculated annually for local municipalities (the number has varied, from 522 prior 2009 to 120 local municipalities after 2009 using 4 indicators). Instead of the min-max

normalization method, which is used in case of HDI, the z-score method is used, and the later aggregation of indicators is done by simple weighted arithmetic average. The value of the index shows to what extent a territory deviates from average development level in group, the group being all local municipalities. The initial purpose of the index was to determine territories which are in need for special additional support from national government in order to overcome severe socioeconomic underdevelopment. At the same time the index became popular as a simple tool to measure territorial development and it has been used in reports related to regional development and for policy purposes. A complete account how methodology of the index has evolved during more than 10 years and various ways the index has been used for policy making and also the evaluation, can be found in (Hermansons 2012). The time series of the index and its components can be found in Regional Development Indicators Module website⁷, which is a hub for territorial statistics.

Building upon work done by Statistical institute of Latvia and various criticisms made by local municipalities and scholars, I proposed a new index at the local municipality level consisting of ten indicators. The proposal with initial calculations and extended analysis was included in a separate report of the Ministry of Environmental Protection and Regional Government of Latvia (Ministry of Environmental Protection and Regional Development of Latvia 2013). The index was approved by the Cabinet of Ministers of Latvia in 2014 and the number of indicators was reduced to eight (see table 3). Another study, not explicitly aiming to improve the territorial development index introduced a municipality investment attractiveness index elaborated by Ernst &Young Baltic as part of an international project for a number of local municipalities across Central Baltic Sea region including Latvia. The index proposed human development and quality of life as one of index components, 8 in total (Ernst&Young 2013). As the purpose of

⁷ <u>http://raim.gov.lv/pub/en/</u>

including human development as a part of the index was to look at it as a possible factor which could affect investment, human development is not seen as ultimate goal, but just as an investment tool.

A very recent study has proposed measuring well-being at the local municipality level. As wellbeing is a very broad theoretical concept and has been extensively covered in academic literature, the authors have come with a focused approach covering labor market, economic activity, demography, safety. This set of dimensions also match the availability of statistics at the local municipality level, the authors propose 8 indicators for composite index (Jēkabsone and Sloka 2014). However, the chosen indicators very much resemble indicators which have been used to measure territorial development. The following Table 3 summarizes which dimensions have been included in the above mentioned composite indicators and specifically which indicators have been used in each case.

As it can be seen, none of the composite indicators is designed to specifically measure human development. Moreover all of them lack one or more original components of HDI - long and healthy life, being educated or having a decent standard of living. The purpose of this study is to propose composite indicator which solely focus on human development and do not deviate from the original concept of human development with the three dimensions. Why to interpret human development narrowly when it comes to measuring it at the local level in Latvia?

Undoubtedly, the question of what human development is has been discussed extensively in academic literature and the concept has acquired different additional dimensions making one wonder how different human development is from such terms as "well-being", "quality of life", "happiness", etc. which widely circulate in academic discussions. In an excellent overview of how the concept of human development has evolved both in practice and theory, Alkire argues that ever since it was first defined it has never been fixed, however over time it has retained

some core ingredients like long and healthy life, being educated and having a decent standard of living, as well as some basic assumptions, one of them being expanding people's choices (Alkire 2010).

| Territory development index (2000) | Objective well-being index (2014) | Improved Territory development index (2014) | Investment attractiveness index (2013)** | | | | |
|---|--|--|---|--|--|--|--|
| Unemployment rate,% Amount of personal income tax per capita, LVL Change in permanent population over past 5 years,% Demographic burden - number of children and pensioners over the persons of working age expressed per 1000 residents | Unemployment rate,% Amount of personal income tax per capita, LVL Change in permanent population over past 5 years,% Economically active business entities per 1000 residents Total recorded criminal offenses per 1000 residents Employment rate, % Average monthly wages, LVL Birth rate, % | Unemployment rate,% Amount of personal income tax per capita, LVL Economically active business entities per 1000 residents Total recorded criminal offenses per 1000 residents Proportion of low- income persons,% Crude rate of natural increase per 1000 residents Crude rate of net migration per 1000 residents Old age dependency ratio – number of pensioners over people of working age expressed per 1000 residents | Unemployment rate, % Average gross pay of working population, EUR Total recorded criminal offenses per 1000 residents Number of residents at the beginning of the year Proportion of working-age population at the beginning of the year, % Proportion of young age cohort (15-24 years), % Proportion of population having higher education,% Number of vocational schools per 1000 residents Number of higher educational establishments per 1000 residents Number of doctors per 1000 residents Number of housing units per 1000 residents Number of cultural establishments (museums, theatres, cinemas, culture/ creativity centres) per 1000 residents | | | | |

Table 3: Overview of composite indicators elaborated to measure development at local municipality level in Latvia**

*Blue color in the table shows which indicators overlap. **Approved by the Cabinet of Ministers in July 1st, 2014: Act No.367. ***Only dimension of human capital and quality of life displayed out of 8 in total Source: Prepared by the author The fact that the three dimensions have gained such undivided attention when it comes to discussing human development (see Table 4), gives reason to argue that they are the most important. Secondly, it is beyond the scope of this study to discuss in a proper manner all the various perspectives of human development so as to arrive at a solid list of dimensions which can be attributed to Latvia. Therefore, sticking to core concepts is more desirable. Thirdly, there is a problem with data availability when it comes to the local municipality level. If one aims at doing justice to current debates which interpret human development as a broad concept then these endeavors will likely fail, because it will not be possible to include many dimensions in the composite indicator. Consequently, some would be included but some left out, based on the availability of statistics, hence in my opinion in that kind of case the composite indicator would clearly suffer from absence of theoretical justification in terms of content and show incomplete picture.

| Dimensions mentioned | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 07 | 09 |
|--------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| in HDR by year | | | | | | | | | | | | | | | | | | |
| Long healthy life | x | X | X | х | х | X | X | X | X | x | X | x | x | x | X | X | X | x |
| Knowledge | X | X | X | Х | Х | X | Х | X | X | X | X | X | X | X | X | X | X | X |
| Resources for decent std of life | Х | X | Х | Х | Х | Х | Х | X | X | X | X | X | X | X | X | Х | Х | X |
| Political freedom | x | X | | | | | | X | | | | | | | X | | | x |
| Guaranteed Human Rights | х | | | | | X | | X | | X | X | | | | | | | |
| Self Respect | X | | | | | X | | X | | X | X | | | | | | | |
| Good physical environment | | X | X | | Х | | | | | | | | | | | | | |
| Freedom of Action & Expression | | | X | | | | | | | | | | | | | | | |
| Participation | | | | X | X | | | | | | | | X | | | | | |
| Human Security | | | | | х | | х | | | | | | | | | | | |
| Political, Social & Econ Freedoms | | | | | | X | | X | X | X | | | | | | | | |
| Being creative | | | | | | X | | X | X | X | X | | | | | | | |
| Being Productive | | | | | | X | | X | X | X | X | | | | | | | |
| Freedom | | | | | | | Х | X | | | | | | | | | | |
| Democracy | | | | | | | Х | | | | | | | | | | | |
| Dignity & Respect of others | | | | | | | | X | | | | | | | | | | |
| Empowerment | | | | | | | | | X | | X | | | | | | | |

Table 4: Human development dimensions mentioned in different HDRs

| A sense of belonging to a | | | | | Х | Х | X | | | | | | |
|----------------------------|--|--|--|--|---|---|---|--|---|---|---|---|---|
| community | | | | | | | | | | | | | |
| Security | | | | | | | X | | | | | | X |
| Sustainability | | | | | | | X | | | | | | |
| Enjoying political and | | | | | | | | | X | | х | | |
| civil freedoms to | | | | | | | | | | | | | |
| participate in the life of | | | | | | | | | | | | | |
| one's community | | | | | | | | | | | | | |
| Cultural liberty | | | | | | | | | | х | | | |
| Social & Political | | | | | | | | | | | х | | |
| Participation | | | | | | | | | | | | | |
| Civil & Political Rights | | | | | | | | | | | | х | |

Source: Adopted by the author from (Alkire 2010, page 14)

Methodology and data sources

The methodology of this study involves developing a composite indicator or index so that I could test Hypothesis (I). My approach would fit in the third group described by UNDP and entails a new calculation methodology other than that used in the global human development report, as well as new indicators strictly relevant to the concept of human development (UNDP Poland 2013). I will thus introduce new indicators which are locally adjusted given availability of statistics, but still cover the three core dimensions of human development: a long and healthy life, being educated, and having a decent standard of living.

In terms of indicators, the starting point inevitably is data availability. Unfortunately Latvia is in a disadvantageous position regarding territorial statistics both internationally and domestically. Data availability for NUTS III regions - usually the lowest level for crossnationally comparable analysis is limited when it comes to international comparisons across Europe. Therefore, analysis is usually done for NUTS II regions. Latvia together with other two Baltic states, Lithuania and Estonia, are the only countries in the European Union where the whole country is treated as a NUTS II region. Consequences are far reaching. As previously mentioned, European Commission has calculated regional human development indexes for the whole European Union using NUTS II regions that cannot cover the regions of Latvia. The data availability problem can also be observed domestically. Latvia consists of 119 local municipalities for which elections are held every four years, and 5 regions which function as administrative bodies and are not elected. The Ministry of Environmental Protection and Regional Development of Latvia together with Central Statistical Bureau of Latvia in 2009 carried out a joint project to document for the first time the availability of territorial statistics and results revealed serious shortcomings (Central Statistical Bureau of Latvia 2011). Therefore, it does not come as a surprise that none of the HDI indicators are available for local municipalities given the number of municipalities (119) and small size of the country. At regional level only statistics for GDP is available.

Taking into account these shortcomings I propose three indicators which are easily available with no missing data, coming from reliable statistical sources.

| HDI dimension | Indicator | Data source and notes |
|---------------------------------------|--|--|
| Long and healthy life | Mortality rate (excluding external causes) per 1000 of population | The Centre for Disease Prevention and Control (CDPC) of Latvia. Year 2013. Data retrieved from the CDPCs website: <u>http://www.spkc.gov.lv/veselibas-</u> <u>aprupes-statistika/</u> |
| Being educated | Persons aged 15 and over with a university degree, including doctorate holders, % | 2011 Census data. Data retrieved from the Central Statistical Bureau website: <u>http://www.csb.gov.lv/en/statistikas-</u> temas/population-census- <u>30761.html</u> |
| Having a decent standard of living | Amount of personal income tax per person being employed in EUR | State Revenue Service. Income tax is used because data is based on person's actual residence thus giving more accurate picture of person's income in particular municipality, whereas monthly wage statistics coming from Central Statistical Bureau is based on where employer (or headquarters) is registered. Year 2013. Data retrieved from Module of Regional Development Indicators: www.raim.gov.lv/pub/en |

Table 5: The Local Human Development Index for Latvia and its components

As far as the calculation methodology is concerned, I propose to use z-scores for normalization and arithmetic means for the aggregation of indicators. This method is used to calculate the above mentioned territorial development index and has been proven effective for more than 10 years. It is also recommended by OECD as one of the normalization methods (OECD 2008). It would capture territorial differences more clearly than min-max normalization method which used in case of HDI, because as a reference, average value in group is used and later normalized value is expressed as deviation from average. In min-max approach observed or fixed minimal and maximal values are used in the process of normalization, therefore as a reference, variation range between minimal and maximal value heavily depends on these values. In addition, the biggest advantage would be a possibility to compare results with already existing territorial development index, thus understanding whether this new human development index brings new insights or results confirm the existing trend – higher development in Riga and its surrounding region, lower development in region of Latgale which borders Russia.

The calculation is based on following steps:

a) Normalization of each HDI indicator using the following formula:

$$t = \frac{\mathbf{x} - \overline{\mathbf{x}}}{\mathbf{s}}$$
 , where

- t normalized value for indicator;
- x indicator in its specific unit of measurement;
- \overline{x} mean value for local municipality group in its specific unit of measurement;
- *s* standard deviation that is calculated using following formula:

$$s = \sqrt{\sum (x - \overline{x})^2}$$
 , where

b) Aggregation of each normalized indicator (equal weights) using arithmetic mean

Before calculation one should consider issue of weights for indicators as they can possibly play a deciding role. Weights can be equal or different for each of the indicators, deciding on weights that can involve various methods, but one of the most popular is using expert opinions to determine weights. For example in the above mentioned case of Mexico the author used equal weights arguing that the approach is transparent and address the issue that unequal weights are always to some extent arbitrary without firm justification (Permanyer 2013). As far as original HDI is concerned, equal weighting of indicators, the procedure which has not been amended by UNDP since the HDI was first published, has substantial justification in academic literature. A study which employed responses from 105 researchers across 60 countries covering the whole world concluded that the weights researchers proposed for HDI indicators are not statistically different from equal weights, also recalculation of HDI using new weights did not substantially alter country rankings (Chowdhury and Squire 2006). Similarly equal weighting has also been justified using statistical analysis – studies using Information Theory (Stapleton and Garrod 2007) and Principal Component Analysis (Nguefack-Tsague, Klasen, and Zucchini 2011) argue that HDI should not divert from the equal weighting approach. Consequently, I propose to use equal weights.

In terms of graphical representation methods I will use GIS to map the results of composite indicator values or measures generated in-between steps. This technique will improve our understanding, especially for those who are not familiar with Latvian municipalities and their spatial placement, and it always is a good data presentation and dissemination tool. The European Observation Network for Territorial Development and Cohesion has developed comprehensive reference material from how to construct data intervals to how to choose appropriate colors when building maps (Zanin, Lambert, and Ysebaert 2011). Indeed, the value of graphical representation methods should not be underestimated, for instance UNDP has collaborated with Massachusetts Institute of Technology on representing the HDI values (see Hidalgo 2010).

Regarding the examination of Hypothesis 2 to 4 I propose to use several variables (independent variable) to explain the variation in local HDI for Latvia (dependent variable) applying multiple linear regression where local human development index is continuous variable.

| Dependent varia | ble | |
|------------------|--------------|--|
| Variable | Coding | Notes |
| Local Human | L_HDI | Calculated for every local municipality of Latvia using the |
| Development | | three indicators mentioned above |
| Index | | |
| Independent var | iables | |
| Dummy for | City | Those local municipalities which contain city or several |
| containing city | | cities are coded as "1" |
| Dummy for | Border | Those local municipalities which have boarder with foreign |
| being border | | country are coded as "1". Determined according to |
| territory | | Regional Policy guidelines 2013-2019 for Latvia ⁸ |
| Dummy for | Eastern_b | Those local municipalities which have border with Russia |
| being Eastern | order | and Belarus are coded as "1". Determined according to |
| border territory | | Regional Policy guidelines 2013-2019 for Latvia. |
| Dummy for | Coastal | Those local municipalities which have border with Baltic |
| being coastal | | sea are coded as "1". Determined according to Regional |
| territory | | Policy guidelines 2013-2019 for Latvia. |
| Distance to | Dist_Rig | Calculated using ArcGis, data source GIS Latvija 10.2 ⁹ . |
| Riga, km | а | Distance for every local municipality to Riga as a straight |
| | | line from centroid to centroid. |
| Financial | Subsidy | Amount of money paid from special fund to equalize |
| equalization | | financial gap among local municipalities in terms of |
| subsidy per | | resources to execute their functions. It indicates lack of |
| 1000 of | | financial capacity. Year 2013.Data source: State Regional |
| population | | Development Agency of Latvia: |
| | | http://www.vraa.gov.lv/lv/analitiska_darbiba/statistika/deve |
| | | <u>lop/</u> |
| European Union | EU_Fund | Only Cohesion fund, Regional Development Fund, and |
| funding per | | Social Fund included. Year 2013. Data source: Module of |
| 1000 of | | Regional Development Indicators: |
| population | | http://raim.gov.lv/pub/en/ |
| European Union | EU_Fund | Specific funding for agriculture and fishery. Data source: |
| funding for | _Agr | Module of Regional Development Indicators: |
| agriculture and | | http://raim.gov.lv/pub/en/ |
| fishery per 1000 | | |
| of population | | |
| Active | Economy | Data source Central Statistical Bureau of Latvia. Year 2012 |
| individual and | | |
| commercial | | |
| firms per 1000 | | |
| of population | X 7 . | |
| Voter turnout in | Voting | Voter turnout in 2013 municipal elections. Data Source: |
| municipal | | I ne Central Election Commission of Latvia: |
| elections. % | 1 | nttp://www.cvk.lv/plip/pliplic/30491.html |

Table 6: Determinants of local human development in Latvia

⁸ Regional Policy Guidelines 2013-2019 for Latvia: <u>http://polsis.mk.gov.lv/LoadAtt/file5640.doc</u>
⁹ GIS Latvija 10.2 : <u>http://www.envirotech.lv/lv/aktualitates/gis-latvija-10-2/</u>

Data analysis

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Calculated local human development index is composite indicator whose value is an unweighted average of standard deviations, thus the value of index can range from +3 to -3. The summary statistics are presented below for the values of local human development index. One can observe that the index is spread on both positive and negative end with the largest values being more than +/-2.

| L_HDI | | | | |
|-------|-------------|----------|-----------|----------|
| | Percentiles | Smallest | | |
| 1% | -2.161 | -2.188 | | |
| 5% | -1.897 | -2.161 | | |
| 10% | -1.686 | -2.123 | Obs | 119 |
| | | | Sum of | |
| 25% | -1.276 | -1.923 | Wgt. | 119 |
| | | | | |
| | | | | - |
| 50% | 7 | | Mean | .6140924 |
| | | Largest | Std. Dev. | .9524558 |
| 75% | 204 | 1.944 | | |
| 90% | .592 | 2.126 | Variance | .907172 |
| 95% | 1.762 | 2.274 | Skewness | 1.154475 |
| 99% | 2.274 | 2.645 | Kurtosis | 4.654322 |

Table 7: Summary statistics for the local human development index

The results also indicate that indeed there is exists spatial variation across local municipalities. 21 local municipalities have positive index value, the rest 98 have negative value. It means that there is disbalance in terms of territorial development as average is the reference few municipalities with a high human development set it high thus most of the municipalities are lagging behind. The spread which can be well seen in the histogram (Figure 3.) also indicates that majority of local municipalities are not concentrated close to average which means that there are considerable differences in terms of level of human development.



Figure 3. Local human development index – histogram results

When it comes to examining where exactly one can observe the variation, the results indicate that the highest human development can be seen around capital city Riga, which is not surprising result given the huge impact Riga has on surrounding local municipalities in terms of economic development and the fact that many people commute to Riga for work, but live outside in surrounding territories which contribute to their high human development. The lowest human development can be seen in border territories, especially those which border Russia and Belarus – see figure 4.



Figure 4. Mapping local human development index

Source: prepared by the author

One can observe that the whole eastern region of Latgale is lagging behind not just separate municipalities, it indicates of systematic failure of national government to develop this part of Latvia. The result in some ways is not surprising, given that Latgale region systematically have performed poorer over time and is lagging behind.

The following will look into multiple regression results exploring the potential determinants of human development level. My interest is to test the above mentioned hypothesis.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|----------------------|-----------|------------|---------------------|-----------|------------|--------------|
| | L_HDI | L_HDI | L_HDI | L_HDI | L_HDI | L_HDI |
| City | -0.106 | | | | -0.0769 | -0.0967 |
| | (-0.60) | | | | (-0.78) | (-0.93) |
| | | | | | | |
| Dist_Riga | | -0.0108*** | | | -0.00341** | -0.00427*** |
| | | (-10.75) | | | (-2.85) | (-3.44) |
| ~ | | | 0 0 0 0 <*** | | 0.000 | |
| Subsidy | | | -0.0826 | | -0.0306 | |
| | | | (-12.63) | | (-3.64) | |
| Economy | | | | 0.0664*** | 0.0440*** | 0.0518*** |
| Leonomy | | | | (17.34) | (7.58) | (0.12) |
| | | | | (17.34) | (7.58) | (9.12) |
| Boarder | | | | | 0.0930 | 0.0667 |
| | | | | | (0.81) | (0.55) |
| | | | | | (0.0-) | (0.000) |
| Eastern border | | | | | 0.288 | 0.163 |
| - | | | | | (1.50) | (0.82) |
| | | | | | | |
| Coastal | | | | | -0.269 | -0.176 |
| | | | | | (-1.93) | (-1.21) |
| | | | | | | |
| EU_fund_Agr | | | | | -5.17e-09 | -0.000000313 |
| - | | | | | (-0.02) | (-1.22) |
| | | | | | | |
| EU_fund | | | | | 4.52e-09 | -2.13e-08 |
| | | | | | (0.03) | (-0.13) |
| | | | | | | |
| Voting | | | | | -0.000494 | -0.00469 |
| | | | | | (-0.07) | (-0.62) |
| | 0 55 4*** | 0 501*** | 0.252** | 0 150*** | 0.001* | 0.095* |
| _cons | -0.554 | 0.391 | (2.82) | -2.139 | -0.901 | -0.985 |
| λζ | (-4.14) | (4.61) | (2.83) | (-21.49) | (-2.46) | (-2.55) |
| IN D ² | 119 | 119 | 119 | 119 | 119 | 119 |
| Л | 0.003 | 0.497 | 0.577 | 0.720 | 0.802 | 0.778 |

Table 8. Determinants of human development in multiple linear regression

Regression is performed using 6 models where the logic is to test binary relationship between each of the predictors and local human development index – Model1 \rightarrow H(2); Model2 \rightarrow H(3); Model3 \rightarrow H(4); Model4 \rightarrow H(5). Model 5 then is meant to control for the other factors. Notably one group of controls is whether a local municipality belongs to coastal, border or eastern border territory – these dummy variables are introduced, because according to "Regional Policy Guidelines 2013-2019 for Latvia" these groups of territories are mentioned as distinct with their own development characteristics and thus deserving diversified policy and investment support. Other control variables are measures of the European Union funding, because obviously the level of investment is important when one wants to look at the level of development. In terms of data accessibility European Union funding investment is well documented and freely available compared to state made investments. Voter turnout is also included as a control due to the fact that it might show whether local inhabitants trust politicians, low turnout might suggest that local politicians act not in the interest of local citizens and perform more extractive policies which might negatively affect human development. Model 6 is designed to account for caveat that there exists endogeneity problem when it comes to financial equalization subsidy, because low level of human development can equally determine the received sum of subsidy, the relationship works both ways.

As far as the hypothesis are concerned the regression results show that for (H2) surprisingly presence of a city does not affect human development as the r-square is very low and more importantly the coefficient is negative which means that the relationship is reverse. For (H3) the relationship is strong and as predicted the distance affects human development negatively. For H(4) the relationship is also strong and indicates that low financial capacity leads to lower level of human development. For H(5) the relationship is strong and positive, binary regression gives r-square of 72%.

When controlling for other factors the level of economic development retains its explanatory power most significantly as regression coefficient is stable across the regression models and the increase of r-square for model 4 and 6 is not that significant. The regression model 6 at the same time indicated overall good explanatory power when it comes to predicting human development – r-squre 77%.

Findings and conclusion

One of the major findings is that the method of disaggregation of human development index using local municipality as a unit is indeed useful as it reveals the degree of disparities which exists among territories within state. National Human development index can indicate of high human development and good standing among other countries, but the praise can be too exaggerated if one looks at the local level. The proposed local human development index for Latvia shows that there exists differences in human development across local municipalities with those close to capital city Riga enjoying high human development while those at the eastern part of Latvia and especially bordering Russian and Belarus. This finding is similar to what is already known from annual calculations of territory development index, which also show the same pattern when it comes to territorial development in general, not looking specifically at human development (Ministry of Environmental Protection and Regional Development of Latvia 2013).

The most interesting finding is that cities do not determine the level of human development. Currently in Latvia and also European Union there is great emphasis on cities as regional development drivers, also the academic literature has indicated the same. This study has not find support for the argument that cities themselves might be a decisive factor for regional and human development. In fact as M.Polese argues: "Wealth creation at the local level will not happen, no matter how large the city, unless the necessary preconditions—whose foundations are grounded in society as a whole—are also present" (Polese 2011); see also (Polese 2006) for the same argument explained in detail. Indeed the low level of human development in eastern part of Latvia is systematic and widespread, thus presence of cities is not a key factor to determine the catching up with the rest of Latvia. But that ofcourse is not to say that cities do not have a potential.

The study also shows that economic development is closely linked and determines human development. This finding nicely complements the above mentioned that presence of the city must be complemented with other preconditions for development and certainly economic development is one of them.

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