

Czech University of Life Sciences in Prague

Faculty of Economics and Management

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Diploma Thesis

**Index of Quality of Urban Life according to age: International
comparison**

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Declaration

I declare that I have worked on my diploma thesis titled “Index of Quality of Urban Life according to age: International comparison ” by myself and I have used only the sources mentioned at the end of the thesis.

In Prague on 15/3/2013

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Index kvality městského života podle věku: mezinárodní srovnání

Index of Quality of Urban Life according to age: International comparison

Souhrn

Tato Diplomová práce se zaměřuje na kvalitu městského života v hlavních evropských městech. Díky právům občanů Evropské unie k volnému pohybu a prohlubující se integraci EU, otázka srovnání kvality života v evropských městech se stává aktuálnější. Literární rešerše se zabývá už existujícími indexy a způsobem, jakým jsou konstruovány, měřeny a vyhodnocovány. Práce se věnuje vztahu stále dominantních ekonomických indikátorů a pocitu životní spokojenosti.

Hlavním cílem této práce je sestavit index, nazvaný QOUL (Quality of Life) Index, který měří, jak úspěšně vybraných 12 měst uspokojuje nároky svých rezidentů v závislosti na věku. Občané jsou rozděleni do 3 skupin: mladí lidé (15 – 25 let), dospělí (26 – 65 let) a senioři (66+ let). QOUL Index je potom sestaven jako agregát 11 individuálních indikátorů pokrývajících oblasti ekonomické aktivity, životního prostředí a zdraví a veřejných služeb. Tyto indikátory mají přidělené váhy na základě Pearsonova X^2 testu, který měří, jak moc individuální indikátory odpovídají zjištěným hodnotám celkové spokojenosti s životem v daném městě, daných Eurobarometer výzkumem, vždy pro danou věkovou kategorii. Na konci jsou prezentovány výsledky všech měst pro každou věkovou kategorii, spolu s agregátním skóre, kde se zkombinovaly výsledky pro jednotlivé věkové kategorie na základě aktuální demografické struktury.

Summary

This Diploma thesis focuses on issue of quality of life (QOUL) in major European cities. Thanks to EU citizens' right to freedom of movement and continuing integration of the EU, question of comparing QOUL across major cities become more important. Literature review deals with current indexes and the way they are constructed, measured and evaluated. Relationship

between standard economic indicators that still dominate paradigm of today's policymakers and subjective well – being is examined.

The main goal of this thesis is to construct an index, called QOUL Index that measures how well 12 selected cities satisfy needs of their citizens according to age. Dwellers have been divided into three age groups: young people (15 – 25 years), adults (26 – 65 years) and seniors (66+ years). The QOUL Index is then built as a total sum of 11 individual indicators, covering economic performance, environment and health and public amenities. These indicators are weighted based on results of Pearson X^2 test measuring how closely results of individual indicators are related to overall life satisfaction scores as interviewed in Eurobarometer Survey for each given age group. Then the final scores for each city and each group are presented, along with aggregate scores where 3 individual scores are merged based on current demographic structure of each city.

Klíčová slova: kvalita života, alternativní indikátory, městské prostředí, porovnání, urbanizace, kvalita prostředí, mezinárodní srovnání, Evropa, věkové kategorie, životní styl

Keywords: quality of life, alternative indices, urban environment, comparison, urbanization, environmental quality, international comparison, Europe, age groups, lifestyle

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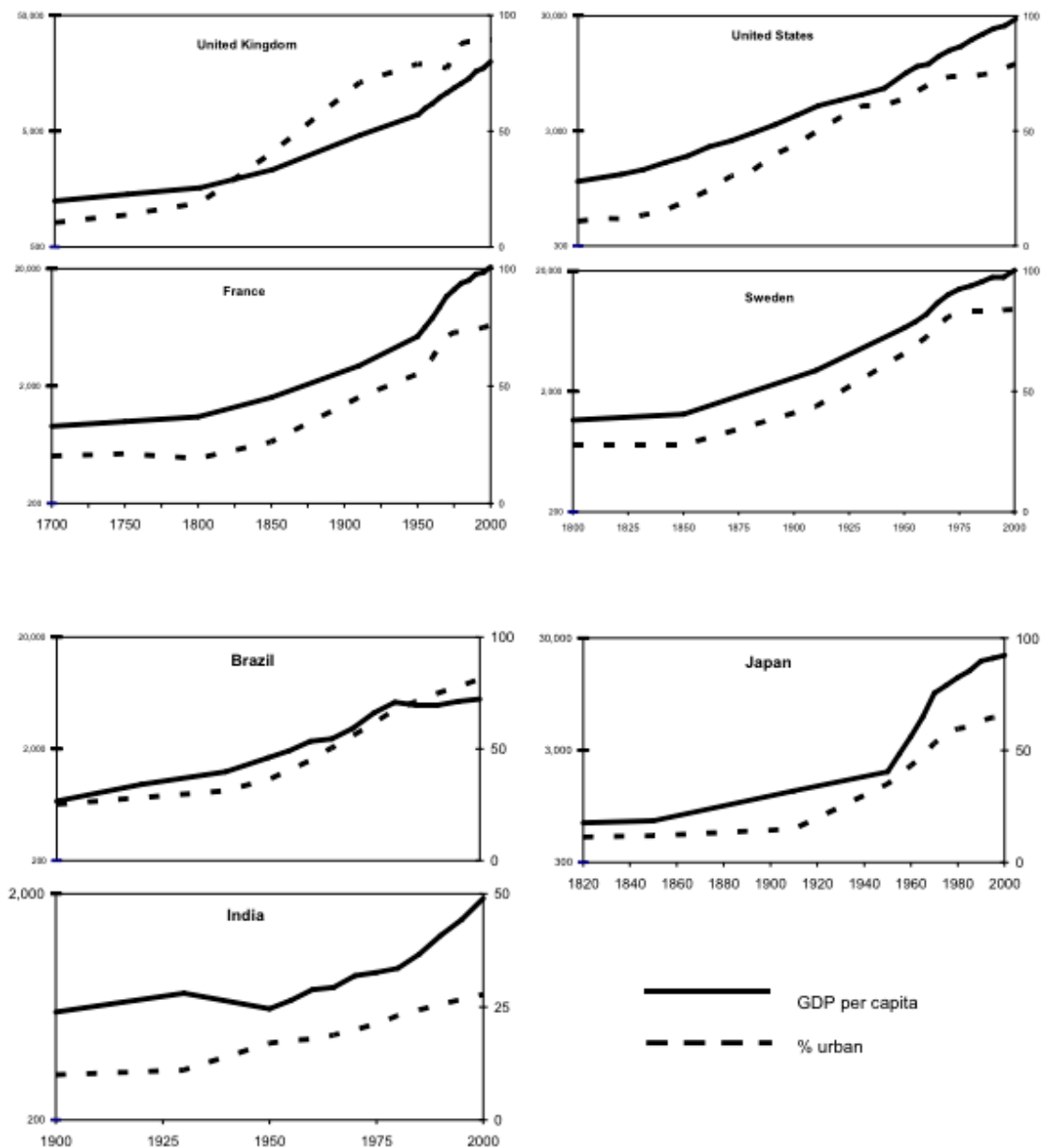
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1 Introduction

'The place we choose to live affects every aspect of our being. It can determine the income we earn, the people we meet, the friends we make, the partners we choose, and the options available to our children and families. People are not equally happy everywhere, and some do a better job of providing a high quality of life than others. Some places offer us more vibrant labor markets, better career prospects, higher real estate appreciation, and stronger investment earning opportunities. Some places more mating markets. Others are better environments for raising children.'

Richard Florida, *Who's Your City*

This work concentrates on quality of life specifically in urban environments. Cities and its surroundings were chosen because the overall trend is obvious: as economic development progresses, structure of economy changes. As Sanford mentions: 'Capital and skilled labor are substituted for unskilled labor and an increased share of the work force is concentrated in manufacturing and skilled services.' (Sanford, 2003, p. 15) Share of agricultural production is declining as most capital is being invested in areas with highest available returns. Only 4% of men and 2% of women in high-income countries were employed in agricultural sector, respectively 22% in case of middle-income countries. This is all followed by massive resettlement of people from rural areas to cities and large urban areas. In 2050, two thirds of world population is expected to reside in cities. (BBC News site)



Real GDP per capita and Percent of Population in Urban Places in Seven Countries Source: Easterlin, 2007, p. 38

The table above illustrates how major trend urbanization is. With growing populations, urban areas keep growing too. In fact, the urbanization was so dramatic developing countries are not able to satisfy growing needs of its cities, often dealing with complicated infrastructure. As expected, cities in in different income group countries face very different issues.

Low-income groups, quite surprisingly, do not show big gap between the share of population in urban areas and access to adequate sanitation. Middle-income countries, especially upper middle-income ones, exhibit much bigger problem. The gap disappears for high-income countries. Similar relationships might be true for public access to adequate housing, congestion and pollution, experiencing rapid urban growth. (Lim, 1999)

2 Objectives of thesis and methodology

This work will focus on perception of life in the most developed countries, specifically in Europe. Number of studies have examined life in urban areas and those will be analyzed in literature review. This thesis aims at looking at various problems of city life from perspective of different age groups, assuming those groups lead different lifestyle and have different requirements and expectations on cities they dwell in. Simply put, what is the best for young people, families or seniors? And what do these people care about?

2.1 Research questions and hypothesis

Unlike other indicators, this thesis looks for the best city **specifically for three age groups**. Therefore, the research questions are:

Which city offers the best quality of life for young people, aged 15-25 years?

Which city offers the best quality of life for adults setting up families, aged 16-65?

Which city offers the best quality of life for seniors, aged 66 and older?

Finally, individual scores will be summed together in the final index with weights reflecting proportion of population based on demographic information available from statistical polls. This will give us a clear idea of demographic structure and we may also ask one more question:

Which city offers the highest quality of urban life overall?

Before these question can be answered, we must find out what are the priorities that determine quality of life for each age group. Another research question is then:

What influences quality of urban life and to what extend?

2.2 Definition of age groups

Many of existing indices evaluating quality of life focus only on leisure side and ability to enjoy, and very often **consume** various assets. Others focus on 'green' quality of a city, its sustainability. Most of them overlap in, at least, some areas, giving certain consensus on what is considered to influence quality of life in cities. Most of them rank cities as how good they treat the whole population. This work will look at this issue from point of view of three different age groups. They are defined as follows:

2.2.1 Young people

People aged 15 – 25, mainly students but also assuming that some of them started working already. This division follows various studies that divide population into very similar age groups, sometimes with slight deviations. Sample size: 3,469 respondents

2.2.2 Adults

People aged 26 – 65. Although average retirement age is slightly over 60 years in the EU, it is predicted to rise quickly to 65. In fact, age of 65 was set as a retirement age target for EU countries, to be achieved in 2010. For 2016, average retirement age shall be raised to 66 years, and in 2046 to 70 years. Sample size: 15,995 respondents.

(<http://www.thisismoney.co.uk/money/pensions/article-1696682/Rising-retirement-ages-in-Europe-compared.html>)

2.2.3 Seniors

People aged 66 and older assuming most of them finished their carriers and started their retirement. Sample size: 4,775 respondents.

2.3 Methodology

As quite a big part of this thesis is spent on subjective well-being, this will be also considered in building the index, represented by not only hard data given by official statistics but also inhabitants' perception of various areas.

In existing research, there have been two approaches to analyze Quality of Urban Life (QOUL)

- the first involved monitoring QOUL through set of indicators – that were obtained from aggregated spatial data using official sources
- the second has involved modeling relationships between characteristics of the urban environment and measures of peoples' subjective assessment of QOL domains. This usually involves data collection through surveys. (Markans, 2011)

The index that will be created in this work will use both official hard data obtained by Eurostat measuring performance of cities in criterions that can be measured directly. On top of that, perceptions of some aspects of urban life are also included into the index, given by a recent Eurobarometer, specifically focused on European cities. One of the perks of European Union activity is a plethora of statistical data. Unfortunately, most of it is measured on a national level where it makes most sense. Even data available for cities are mindboggling: ranging from number of car thefts, over daily visits to official Internet sites to number of scheduled water stoppages. Unfortunately, most of them are available only for certain cities and certain time periods. The idea here is to cover most areas that have been covered by other, more established indicators, using as much available data as possible.

The index will work with cross-sectional data, although time series data are also available for Eurostat data. That way, we will look at the most current data available – Eurostat statistics come from 2012, Eurobarometer 194 took place in 2006.

2.3.1 Setting the weights

Most of the tested criteria show characteristics of qualitative data (data gathered from Eurobarometer polls) and the remaining quantitative data were recomputed so all indicators are expressed in a range. Next, to set up the weights, contingency tables were used and Pearson X^2 test was used to measure how much each indicator contributes to the satisfaction with living in a given city. The formula for computing it is below:

$$X^2 = \sum_{i=1}^n \frac{(O_i - E_i)^2}{E_i}$$

X^2 = Pearson's cumulative test statistic

O_i = an observed frequency

E_i = an expected (theoretical) frequency, asserted by the null hypothesis

n = the number of cells in the table

The X^2 Square test is used to determine whether an association (or relationship) between 2 categorical variables in a sample is likely to reflect a real association between these 2 variables in the population. Null hypothesis states that the tested variable values are located in such a distribution. In other words, the X^2 Square test to what extent high satisfaction with a given facet of a city corresponds with a higher overall satisfaction. This can be then used to assess weights which will be set to each criterion. Thanks to significantly different sample sizes for each age group, the X^2 Square tests were recalculated to their respective share within the whole group of variables.

Then, these scores were used to compute final scores for each city and for each age group. This gives us an idea how satisfied different parts of society feel in their cities.

This method gives solid background based on reasoning that the ultimate importance of each city characteristic comes from its utility to citizens. However, the selection of criteria followed methodology of other indicators. If other indicators were added in

and some others erased, the overall results will change again, giving parameters different weights and ranking the cities differently. What this method does is expressing relative weight relations between our selected criteria which will be changing as we move from one age group to other.

3 Literature review

Although most countries have experienced massive development, clearly there are massive gaps in standards of living all over the world. As Eckersley notes: ‘Since 1820, per capita income has increased 13-fold in Western Europe, 17-fold in its Western offshoots (US, Canada, Australia and New Zealand), 10-fold in Southern Europe, 6-fold in Eastern Europe (where income fell after the collapse of communism), 7-fold in Latin America, 6-fold in Asia and Oceania, and 3-fold in Africa. Africa’s average per capita income was about the same in 1992 as that in Western Europe in 1820.’ (Eckersley, 2000, p. 2)

If we look at the Western countries with assumption that Western culture has been and is more dominating globally, the ultimate goal is to live a happy, pleasurable life and happiness plays a key role in it. Better life is very often described in material terms as a rising standard of living, often hastily connoted to national income, gross domestic product.

What does actually quality of life mean? There has been more than 100 definitions of life quality mentioned in literature, focusing more on subjective well-being, happiness, life satisfaction to more environmentally-aware ones, taking into consideration individual ecological footprint. In the end, as Lim mentions, quality of life is: ‘a complex, multifaceted construct that requires multiple approaches from different theoretical perspectives.’ (Lim, 1999, p. 3)

What are those other factors that are relevant to overall quality of life? That varies wildly depending on what income group countries where cities are located we look at. the bottom, low-income countries (and their cities), struggle with illiteracy, infant mortality and life expectancy. On the other end, certain privileges like ability to influence government decision-taking matters to the citizens of high-income countries. International comparisons are therefore a great challenge. Comparing large developing agricultural country with small urbanized country is tricky. Cultural and religious factors also play a role, distorting respondents’ views on abstract issues. Most of the

specialized indicators have been focused to measure only specific group of countries. Usually, ranking countries is divided into developing and developed, each having their own methodology.

3.1 Objective and subjective indicators

We shall make clear that economic indicators are mostly objective. That means they are based on quantitative statistics. Even though they are very useful due to obvious reasons, they also have certain limitations – sometimes they do not truly reflect people’s experience of well-being.

On the other hand, social indicators can be both objective (those used in HDI, for example) and subjective. In that case, individual’s cognitive and affective reactions have to be measured. Quality of life is usually viewed as multidimensional and if the aim is to complexly evaluate quality of human life, we have to include many aspects.

The problem that arises with this is how to weigh findings. Lim (1999) further explains: ‘While most researchers agree that quality of life as a whole is based upon an evaluation of one’s life in a number of domains, what is not clear is the appropriate composition of the constituent domains. (Lim, 1999, p. 8) Choosing and weighting separate indicators and merging them into one sum will always be tricky and based on arbitrary decisions. It is very easy to doubt even so well established indicators such as HDI by asking how the creators can be so sure about the right composition. In that sense, any composite indicator reflects personal experience and viewpoint of a researcher. This index is no different but supports the selected criteria and their weighting by appropriate sociological studies. The index will work with secondary data gathered from official statistics, issued by Eurostat and European Commission.

3.2 Formal approaches

According to Lim (1999), three major philosophical approaches as how the quality of life should be measured.

First method mentions concept of normative ideals-society shares common beliefs that certain things (rules) in our lives dictate the quality of life. This is the case of religious value systems.

Or quality of life can be measured by satisfaction of preferences - people try to enhance their lives as much as the resources are available. This approach comes from utilitarian economic thinking.

The third approach deals with individual experience - if a person experiences his or her life as good and desirable, it is assumed to be so. This approach is mainly used in psychological or behavioural sciences.

3.3 Development in measuring of quality of life

Let's look the third method more closely and examine the term happiness. Happiness, among many other definitions, has also been described as: '...the degree to which an individual judges the overall quality of his/her own life as a whole favorably.' (Kenneth, 2011, p. 66). Richard Easterlin, one of the very first researchers looking into this theme observed that happiness responses are positively correlated with individual income at any point in time: the rich report greater happiness than the poor in the United States within a given year. (Easterlin, 1974)

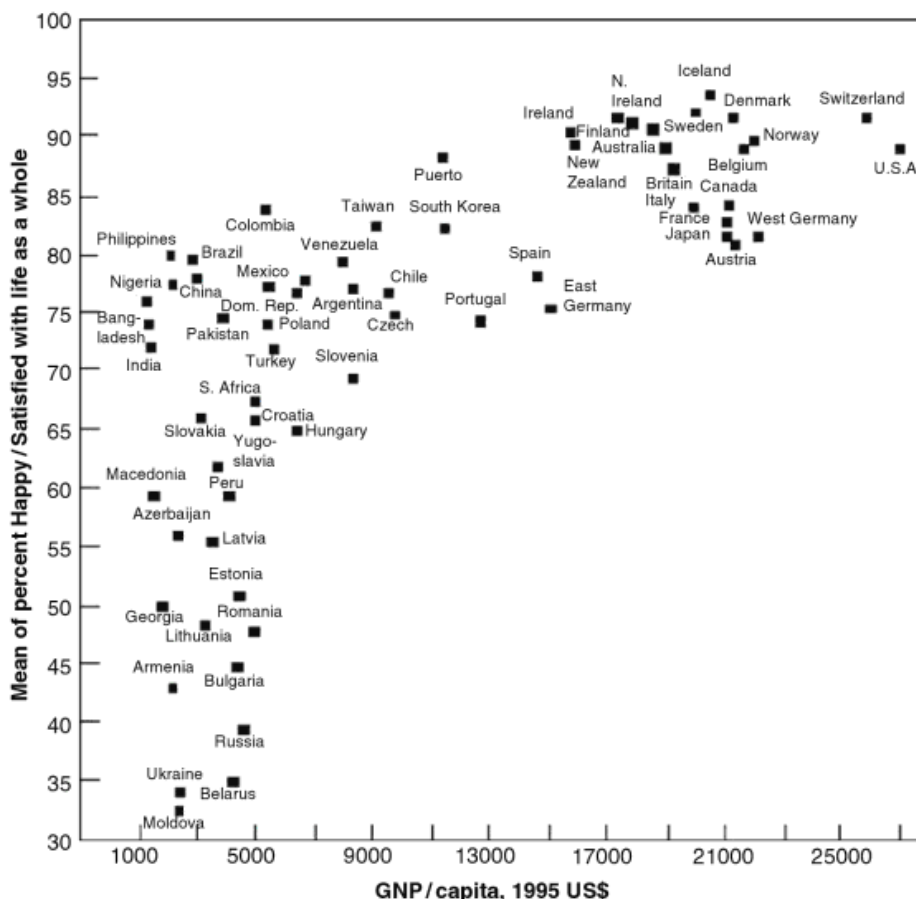
Research has shown that whenever respondents were asked about satisfaction they have tendencies to compare themselves within certain environment, given by social class and local surroundings. Happiness coming from the higher income is heavily dependent on relative position, not absolute.

Important are so called ‘consumption norms’ - benchmarks evaluating how well we are doing within our reference group. (Frey, 2002) Or, as Lim puts it: ‘This is not to suggest that studies of satisfaction and well-being are necessarily explicitly evaluating the quality of life within the environment, but that the environment forms the frame for measures of satisfaction.’ (Lim, 1999, p. 19) Various polls have shown that personal environment serves as a scale - those in lowest income group consistently state they are less happy much more often than those in very high class income group. (Kenny, 1999) It is important to mention diminishing effects of income on our happiness. Widely accepted is also so called adaptation theory where standards of living improve subjective well-being just to certain extent but psychologically, people have great ability to adapt to life events and their overall happiness comes from their character. (Wang, 2007)

According to Kenny (1999), there had been found a weak link between national income per capita and results of happiness-oriented polls. However, if countries are divided into high-income and low-income groups (as mentioned previously) there is no significant correlation. The borderline dividing low income countries where further economic growth actually enables people to fulfill basic, essential, ‘animal’ needs and high income countries has been estimated to 8 000 USD per capita. Japan, experiencing massive growth during 1958 - 1988, reported that levels of inquired happiness stayed the same. Kenny run series of analyses to find out whether this phenomenon holds for the rest of Western world. European countries and the US showed either no or even negative correlation, depending on a kind of method Kenny used. Kenny later speculates: ‘It is possible that there remains a positive utility to absolute income that happens to have been balanced by equal or larger associated negative externalities such as pollution or the process of social modernization. Still, this evidence suggests at least that the utility gained by income in the West is small compared to other determinants of national happiness.’ (Kenny, 1999, p. 15)

Later on, in 1984, Ed Diener introduced the term ‘subjective well-being’ defined as ‘being satisfied with one’s life while feeling good, and this conceptualization also involves both cognitive and affective appraisals of life.’ (Kenneth, 2011, p. 66)

Subjective well-being (SWB) was then measured and indexed as Personal Wellbeing Index (measured by International Wellbeing Group) with international data shown below.



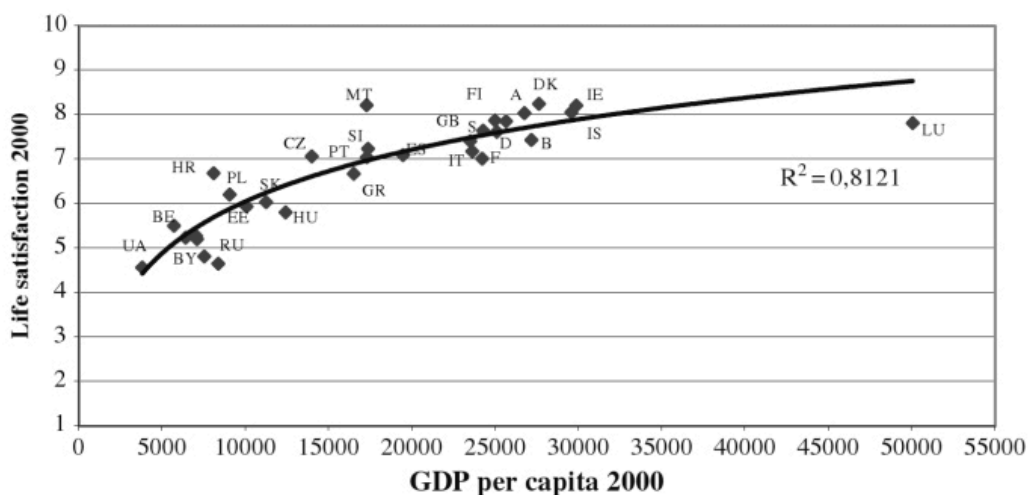
The relationship between SWB and GNP by country. Source: Kenneth, 2011, p. 81

3.4 Further problems of measuring subjective well-being

One of the big issues is no certainty that any social indicator reflects adequately individual experience of well-being. Studies have shown that even very extreme events have short lived effect on subjective well-being. Respondents were remarkably flexible in adapting to various objective conditions, seeing glass of water half empty or half full, depending on individual's personality. (Diener, 1997)

The perception of term happiness in economics is so confusing and widespread that very basic notions have been questioned such as causality of happiness and economic output. Surprisingly, according to OECD poll data ranging over the last forty years show that happiness causes economic growth and not vice versa, as we would normally expect (and that way economists often like to remind us that economic prosperity leads to better well - being). (Kenny, 1999)

On the other hand, Møller examined much tighter sample, European Union, based on data from European Values Study. Møller discovered strong correlation between economic productivity and life satisfaction as demonstrated below:



Life satisfaction by GDP per capita (PPP) Source: Møller, Huschka, Michalos, 2008, p. 4

Although Møller also warns us: ‘...that wealthy nations differ from poorer nations not only in terms of GDP, but in many other aspects of their living conditions and institutional characteristics, e.g. the health care and educational systems, transportation facilities, welfare state provisions and not least ‘governance’.’ (Møller, Huschka, Michalos, 2008, p. 4)

Even though Western countries have experienced unprecedented economic growth in last decades, there has been only very small upward trend in average life-satisfaction. Apart from already explained consumption norms, there is also explanation in certain modernization processes: breakdown of traditional institutions (marriage, religiosity,

trade unions), reported increase in various social pathologies (crime rates, drugs and alcohol addiction), decline in political participation and trust in public authority. (The Economist Intelligence Unit's quality-of-life index report)

3.5 Economic versus non-economic factors

Per capita income and other factors such as disposable income serve well to assess levels of economic development. However, many experts believe that these factors ignore other kinds of societal well-being. This can be seen because of huge discrepancies in other factors within a group of countries with comparable economic performance. (Sanford, 2003)

GDP measurements also lack information about various non-market activities (work at home, family-related tasks), externalities and also distribution of income.

What needs to be stressed is monetary function of any indicator. If the indicator values are expressed in money terms their use is much wider and any reader can directly see the actual benefit/cost. It can be also more easily incorporated into other conventional economic indicators. That is also the reason why there are techniques of non-market evaluation for phenomena that are not traded on the market or simply their real value cannot be monetized directly.

3.5.1 Contingent valuation

The evaluation of externalities that are not traded on the free market is usually done using contingent valuation method. This is based on the premise that an individual's willingness to pay for a particular good may be determined using survey. An ordinary question from a contingent valuation survey could be: how much is your household willing to spend on a programme that will lead to a ten percent increase of Amazon rain forests area? Total public value for such a programme is obtained by summing the individual sums and extrapolating. Contingent valuation methods have been developed to address measurement problems when non-marketable goods are involved, when there

are no independent market measures of value available and when the measured phenomenon may be of esoteric or non-use nature, although this method proves to be quite tricky. The results change dramatically as the exact wording of question changes. (Coursey, 1994)

3.5.2 Hedonic valuation

In some cases (in densely populated urban areas, for example) hedonic pricing method can be useful. This method examines different property prices between various city parts and effects of cultural and environmental factors, assigning them certain market value. This will not be used in this research but it could have been a method that previous researchers used to estimate costs of policy making or investment placement, for example.

3.6 Types of indicators

If direct surveys of satisfaction of life are available, widely respected as giving unbiased image of content with life (simple measure of life satisfaction correlates highly with more sophisticated tests), why bother creating composite indexes and not just use the surveyed answers directly? Economist Intelligence Unit gives an answer: ‘...although most of inter-county variations in measurements can be explained by objective factors, there is still a significant unexplained component which, in addition to measurement error, might be related to specific factors that we would want to net out from an objective quality-of-life index. (Economist Intelligence Unit’s quality of life index report)

Another dilemma policy makers face is what indicators are relevant for their decision making. As Prescott-Allan (2001) notes: ‘A large number of indicators is inevitable, given the broad scope of human and ecosystem wellbeing, but presents an enormous communication problem. Every indicator sends a signal. The more indicators, the more signals... The problem is overcome by combining the indicators into indices. How to do this raises other obstacles, however, because a typical set of indicators is a mess of incompatible measurements. ‘ (Prescott-Allan, 2001, p. 281) Indexes are expressed

either in monetary terms which is useful for direct comparison with conventional economic measurements, but it gets distorted if it is untradeable. Other units are physical units or performance scores.

3.7 Weighting individual factors

Even bigger issue is weighting of selected indicators and this is considered as the weak point of all composite indexes. Some indexes use rather straight-forward arbitrary weighting, some use more sophisticated methods. This will be described in summary of national and city indexes in following chapters.

3.8 List of indexes - countrywide indexes

Following indexes examine quality of life of a whole nation - specifics of smaller local areas are not considered. These indexes can extract data from wider selection of statistics but neglect any difference between urban and rural areas (which seem to be quickly increasing), be it economic or social aspects.

3.8.1 Human Development Index

Probably the most well known index measuring partly non-economic well being is well-known Human Development Index (HDI), prepared by the United Nations Development Program on a scale of 0 to 10, measuring following qualities:

-Life Expectancy of newly born children.

-Adult Literacy rate measured as percentage of people older 15 years who can read and write. Into consideration is also taken Enrollment ratio, counting how many enrolled into various courses, weighted with the remaining one third.

-Real GDP per capita represents quality of life that concerns standard of living.

Note that these two terms refer to something else. Jain explains the difference: ‘Standard of living deals with ‘richness of living‘ and quality of life with ‘completeness of living‘ (Jain, 2006, p. 6)

Since 2010, HDI is adjusted for inequality, bringing a new index called Inequality-adjusted Human Development Index (IHDI). Under perfect equality the IHDI is equal to the HDI but is lower once the inequality starts to be more present. The average loss in the HDI due to inequality is about 23%, hence the global GDP would fall from 0.682 to 0.525. (United Nations website, 2012)

rank	country	HDI value	rank	country	HDI value	rank	country	HDI value
1	Norway	0.943	80	Peru	0.725	150	Cameroon	0.482
2	Australia	0.929	81	Dominica	0.724	151	Madagascar	0.480
3	Netherlands	0.910	82	Saint Lucia	0.723	152	Tanzania, United Republic of	0.466
4	United States	0.910	83	Ecuador	0.720	153	Papua, New Guinea	0.466
5	New Zealand	0.908	84	Brazil	0.718	154	Yemen	0.462

(Source: United Nation HDI report 2011, accessed on 09/07/2012)

Although HDI is one of few indicators covering wide range of developed and developing countries by measuring of how much potential development has been achieved, it can still hardly be useful for nations with ‘very high human development’ as the UN call it. Clearly, literacy is not the Norway’s biggest issue.

3.8.2 European Values Study

The European Values Study (EVS) is a survey research programme started in 1970s, focusing mainly on, as given by the title, values Europeans share and their change over time. As far-fetched as it might seem to this thesis, this survey can very often be a valuable source of data for understanding underlying principles that affect European decision-making. (Møller, Huschka, Michalos, 2008)

3.8.3 WHO Quality of Life

WHOQOL was initiated in 1991 and includes 26 items covering these broad domains: physical health, psychological health, social relationships and environment. The strength of this indicator is large database WHO has managed to obtain.

3.8.4 Quality of Life Index

Another approach measuring quality of life in general is Diener's Quality of Life (QOL) Index is based on 'variables selected for measuring quality of life that are commonly reflective of the prominent values endorsed in the society.' (Diener, Suh, 1997, p. 198) These are divided into respective regions: Hierarchy, Mastery, Affective Autonomy, Intellectual Autonomy, Egalitarian Commitment, Harmon and Conservatism. Basic QOL is used to evaluate developing countries and Advanced QOL is for developed ones. There have been many other indicators trying to create 'GDP with a human face', namely:

Index of Sustainable Economic Welfare

Living Planet Index

Genuine Progress Indicator

These indicators often try to compensate for weaknesses of GDP measurements: lack of information about income distribution, unpaid housework, voluntary work and environmental effects.

3.9 List of indexes - city indexes

Considerably smaller range of city indexes exists as well. To battle lack of statistical data and possible mismatch due to various methodological processes, index creators choose either to narrow down the measured sample or do their own research.

3.9.1 Economist's Quality of Life rating

Built by the Economist Intelligence Unit (EIU), originally coming from EIU's liveability ranking, covering following areas:

Stability (weight: 25% of total)	Healthcare (weight: 20% of total)
Prevalence of petty crime	Availability of private healthcare
Prevalence of violent crime	Quality of private healthcare
Threat of terror	Availability of public healthcare
Threat of military conflict	Quality of public healthcare
Threat of civil unrest/conflict	Availability of over-the-counter drugs
Infrastructure (weight: 20% of total)	General healthcare indicators
Quality of road network	Culture & Environment (weight: 25% of total)
Quality of public transport	Humidity/temperature rating
Quality of international links	Discomfort of climate to travellers
Availability of good quality housing	Level of corruption
Quality of energy provision	Social or religious restrictions
Quality of water provision	Level of censorship
Quality of telecommunications	Sporting availability
Education (weight: 10% of total)	Cultural availability
Availability of private education	Food and drink
Quality of private education	Consumer goods and services
Public education indicators	

Source: The Economist Intelligence Unit's liveability survey methodology site, accessed on 14/11/2012

This part was merged with work of Filippo Lovato, an architect concerned with urban planning who: ‘did this to winning effect with his ‘Spatially Adjusted Liveability Index.’ This added seven new indicators on ‘spatial adjustments’ to the EIU's ranking. Mr Lovato assessed cities' green space, sprawl, natural assets, cultural assets, connectivity, isolation and pollution on a scale of 1 to 5, and then gave the resultant combined score of 25% of the weight of his new index. The remaining 75% is derived from five categories that are actual EIU's ranking: stability, healthcare, culture and environment, education, and infrastructure.’

(<http://www.economist.com/blogs/gulliver/2012/07/city-rankings>, accessed on 14/11/2012)

Unfortunately, the Economist does not disclose how they ended up with these specific weights in their latest public outputs. They, however, explained their methodology of 2005 ranking. The Economist has used multivariate regression to analyze relation between comparable life-satisfaction surveys and various aspects have been found to be associated with life satisfaction in many studies. In case of the Economist Index, this rendered 9 sections that explained over 80 % of the inter-country variation in life satisfaction scores. Then the researchers used Beta coefficients from the regression to derive the weights of the various factors. (The Economist Intelligence Unit's quality-of-life index report).

When working with official polls that include mainly hard quantitative data, regression analysis is more suitable. In case of satisfaction perception surveys with small scales, contingency table and Pearson X^2 test is more fitting.

3.9.2 Mercer Quality of Life Survey

Other private institutions create their own rankings, Mercer's index standing out with big sample of 420 cities where 39 sectors, divided into 10 groups, are reviewed. European cities are ranking the highest, followed by cities of New Zealand and Australia. Mercer, unfortunately, do not share details of structure, nor weights of their index.

Mercer's quality of living factors			
Political and Social Environment	Medical and Health Considerations	Public Services and Transport	Consumer Goods
<ul style="list-style-type: none"> • Relationship with other Countries • Internal Stability • Crime • Law Enforcement • Ease of Entry and Exit 	<ul style="list-style-type: none"> • Hospital Services • Medical Supplies • Infectious Diseases • Water Potability • Sewage • Waste removal • Air Pollution • Troublesome and Destructive Animals and Insects 	<ul style="list-style-type: none"> • Electricity • Water Availability • Telephone • Mail • Public Transport • Traffic Congestion • Airport 	<ul style="list-style-type: none"> • Meat and Fish • Fruits and Vegetables • Daily Consumption Items • Alcoholic Beverages • Automobiles
Economic Environment	Schools and Education	Recreation	Housing
<ul style="list-style-type: none"> • Currency Exchange Regulations • Banking Services 	<ul style="list-style-type: none"> • Schools 	<ul style="list-style-type: none"> • Variety of Restaurants • Theatrical and Musical Performances • Cinemas • Sport and Leisure Activities 	<ul style="list-style-type: none"> • Housing • Household Appliances and Furniture • Household Maintenance and Repair
Socio-Cultural Environment	Natural Environment		
<ul style="list-style-type: none"> • Limitation on Personal Freedom • Media and Censorship 	<ul style="list-style-type: none"> • Climate • Record of Natural Disasters 		

Source: Mercer site, accessed on 16/11/2012

3.10 Other Specialized City Indexes

To give a complete image of available indexes, there is plethora of other minor indexes, often more commercially oriented. They are also issued more often by companies coming from private sector rather than academic field.

Global Cities Index and Emerging Cities Outlook, created by ATKearney (ATKearney Global Cities 2012 report, accessed on 14/11/2012)

Green City Index, created by Siemens (Siemens dedicated Green City Index, accessed on 14/11/2012)

Milken Institute Best-Performing Cities Index, created by Milken Institute (Milken Institute site, accessed on 15/11/2012)

The Globe Shopper Index, created by Custom Research division of the EIU (The Globe Shopper Index site, accessed on 14/11/2012)

Quality of life Survey 2012, created by Monocle (Monocle site, accessed on 14/11/2012)

3.11 Evaluation of urban areas

Before introducing specifics of measuring urban areas, there is much wider emphasis on country to country comparison., when looking at global studies, especially focused on highly developed countries. That is given by fact that most important policy making takes place at central government (which is probably to change due to growing competences of the EU government) and reflected in available statistics. That unfortunately does not take into consideration already big and still growing differences between specific regions, especially large, dense urban areas and countryside.

As mentioned at the beginning, urbanization is still a great moving force, although with different trends, at least in Europe. Three-quarters of Europe's population now live in cities and towns. 'Many of our cities struggle to cope with social, economic and environmental problems resulting from pressures such as overcrowding or decline, social inequity, pollution and traffic.' (European Urban Knowledge Network, accessed on 22/10/2012)

What indicators are usually used to measure quality of urban environment? Markans mentions following:

- Wages and income
- Industrial structure and unemployment
- Housing prices
- Quality of education facilities and production of human capital

- Cultural facilities
- Wetlands
- Scenic views
- Proximity to farmland
- Climate (especially average temperatures)

(Source: Markans, 2011, p. 19)

Rogerson (2009) gives an overview chart demonstrating what studies have selected which criterions over last decades.

Research Dimension	Smith	Liu	Boyer and Savageau	Rogerson et al.	Burnley	Hart et al.	PCC
	1973	1976	1981	1988	1988	1989	1990
Environment/Pollution		X	X	X	X		X
Atmosphere/Peace and Quiet					X	X	X
Climate			X	X	X		
Lifestyle opportunities					X		
Employment				X	X		
Retirement					X		
Housing Costs and Access	X	X	X	X		X	X
Health Care/Public Health	X	X	X	X		X	X
Crime/Public Safety	X		X	X			X
Transport/Traffic flow				X		X	X
Education Provision/Levels	X		X	X		X	X
Recreation			X	X			
Economy/Business climate	X	X				X	
Arts/Cultural diversity	X		X	X		X	
State taxes/Development Aid						X	
Commercial space						X	
Proximity to suppliers/market						X	
Food costs/Cost of living			X	X			
Political Involvement	X	X					
Wages				X		X	

Source: Rogerson, 1999, p. 10

As you can see, most often are represented categories Pollution, Housing Costs and Access and Healthcare, followed by Education Provisions/Levels.

Let us stress once again that no matter how hard scientists will try to stay objective and give the most accurate picture of evaluating living conditions, the selection of individual criterions will be always arbitrary as it is proven above.

4 Analysis

The main part of this analysis is computation of Quality of Urban Life (QOUL) for selected cities and age groups. Let us define scope of research first, mention what will be tested, how the individual indicators will be weighted and what cities will be tested. It has been already mentioned that the data come from time period from 2006 to 2012.

4.1 Tested Cities

The table below shows the selected cities. The selection was made as diverse as respective statistical sources offered needed data. City – focused statistics are generally harder to find and using various sources of information crossed out many other European cities.

Cities	Total Resident Population	Median population age	Total land area (km ²) according to cadastral register
Brussels	1 885 319	not available	1 626.57
Prague	2 099 282	39.2	6 982.90
Berlin	5 025 272	44.6	17 386.59
Hamburg	3 187 338	42.4	7 304.07
Madrid	6 271 638	37.5	8 021.80
Paris	estimated 12 089 098	not available	estimated 14 549
Wien	2 285 988	40.0	not available
Lisboa	2 467 484	40.0	1 469.93
Bucarest	2 176 117	38.8	1 073.33
Stockholm	1 981 263	38.0	6 519.31
London	12 317 800	not available	8 922.26
Istanbul	estimated 13 624 240	not available	not available

Source: Eurostat statistics

However, the final selection is still very wide-ranging, covering some of the most developed and wealthy capitals to some that just recently joined European Union (Bucarest) or are even in the phase of admission talks (Istanbul). Selected cities are

mostly national capitals with exception of Hamburg. This city was chosen to examine relation of a bigger capital to smaller, regional city.

Most problematic to include were London and Paris, cities so enormous that their population is easily greater than of some entire European countries. Obviously, living conditions vary greatly with expectable results – the polls show the highest quality of life in the great centre, QOUL then declines as we move further to the periphery. Both cities are well known for variety of conditions, having luxurious quarters neighboured by much less glossy areas.

Statisticians creating Eurostat and Eurobarometer polls have taken this into account and work with greater areas, including so-called ‘larger urban zones’ into their polls for all major cities. London city centre, for example, yields 312% of average EU income of private households, whereas London including all suburban areas scores only 182% of average EU income, a loss of 42%. Czechs might be also surprised to find population of Prague exceeding 2 million inhabitants. That is because of inclusion of those suburban areas that are occupied by people who commute to Prague. Following the goals of this thesis to come up with recommendations about appropriate cities for various age groups, larger urban zones will be accounted rather than shiny city centres. After all, if anyone were to consider moving to other city, chances are he/she will not move into the very expensive city centre. Moreover, the qualities of a city must be tested in all its parts, not just the centre.

4.2 Selected criteria

There are 11 indicators used in this index. 3 indicators come from Eurostat database and were collected in 2012. 8 remaining indicators come from Flash Eurobarometer 194, issued in November 2006. All Eurobarometer survey questions had 5 options: Very Satisfied, Rather Satisfied, Rather Unsatisfied, Not At All Satisfied, Do not Know/ Not Available. The last option was omitted as willingness or ability of respondents to answer various questions concerning their cities is not relevant to our research. Also, most respondents were able to rate cities and frequency of this answer hovered around 8 percent.

The index is more oriented towards soft data, stressing the previously discussed fact that QOUL is perceived very subjectively. The index is also not heavily focused on economic performance as only two strictly – economic parameters are included. Many other, however, indirectly depend on economic power and wealth of a given city. On the other hand, relevancy between economic output and ability to find employment show rather small X^2 coefficients as shown later and this gives us solid reasoning on why this work focuses on other qualities of tested cities. The hard data were, however, included to base computations on some solid evidence to balance out prevailing perception – type questions.

Following are individual indicators used to compute city scores. They were either used to compute X^2 coefficients and are marked by symbol A or used as independent variables later on in contingency tables (marked by symbol X.)

4.2.1 Economic indicators

X_1 : Primary income of private households (% of EU27 average), gathered from Eurostat statistics. This indicator will have weight assigned from the following indicator but will be used in computing scores. This is based on assumption that private income of private households correlates strongly with difficulties to make ends meet.

A₂: Perceived difficulty to pay bills, asked in Eurobarometer survey, *‘For each of the following statements, please tell me, if this always, sometimes, rarely or never happens to you? - You have difficulty paying your bills at the end of the month’* This indicator will not be present in the final index and is used solely to obtain weight for the previous indicator. Data for this question were inversed to overturn the negative meaning of asked question.

X₃: Unemployment rate, persons aged 20-64 years (%), used for Adults Index, Youth Unemployment rate, persons aged 15-24 years (%), used for Young people. This indicator will have weight assigned from the following indicator but will be used in computing scores. Once again, it is assumed that perceived easiness to find a job is strongly correlated to actual rate of unemployment.

A₄: Perceived easiness to find a job, asked in Eurobarometer survey, *‘Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with this statement? - In [CITY NAME], it is easy to find a good job.’* This indicator will not be present in the final index and is used solely to obtain weight for the previous indicator.

4.2.2 Environment/health

A₅, X₅: Perception of pollution, asked in Eurobarometer survey, *‘Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with each of these statements? - In [CITY NAME], air pollution is a big problem.’* Data for this question were inversed to overturn the negative meaning of asked question.

A₆, X₆: Perception of noise, asked in Eurobarometer survey, *‘Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with each of these statements? - In [CITY NAME], noise is a big problem.’* Data for this question were inversed to overturn the negative meaning of asked question.

A₇, X₇: Perception of healthcare quality, asked in Eurobarometer survey, ‘*Generally speaking, please tell me if you are very satisfied, rather satisfied, rather unsatisfied or not at all satisfied with each of the following issues: - Health care services offered by doctors and hospitals in [CITY NAME].*’

4.2.3 Amenities

X₈: Total number of tertiary students divided by resident population 20-24 years. This indicator will have weight assigned from the following indicator but will be used in computing scores. For this indicator, we have used total number of tertiary students as an independent variable. It does not test the quality of educational facilities (as perception of it would) but rather accessibility and scope of available education. One could argue that by omitting previous education levels this indicator focuses only on one aspect which is relevant to young people only. But it is the tertiary education that is ultimately important even for young families.

A₉: Perception of educational facilities, asked in Eurobarometer survey, *Generally speaking, Please tell me if you are very satisfied, rather satisfied, rather unsatisfied or not at all satisfied with each of the following issues: - Educational facilities in [CITY NAME] such as primary, secondary schools, universities and private schools.*

A₁₀, X₁₀: Perception of easiness to find housing, asked in Eurobarometer survey, ‘*Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with each of these statements? - In [CITY NAME], it is easy to find good housing at a reasonable price.*’

A₁₁, X₁₁: Perception of safety, asked in Eurobarometer survey, ‘*Please tell me, if this always, sometimes, rarely or never happens to you? - You feel safe in [CITY NAME]*’

A₁₂, X₁₂: Perception of cultural facilities, asked in Eurobarometer survey, ‘*Generally speaking, Please tell me if you are very satisfied, rather satisfied, rather unsatisfied or not at all satisfied with each of the following issues: - Cultural facilities in [CITY NAME] such as concert halls, theatres, museums and libraries.*

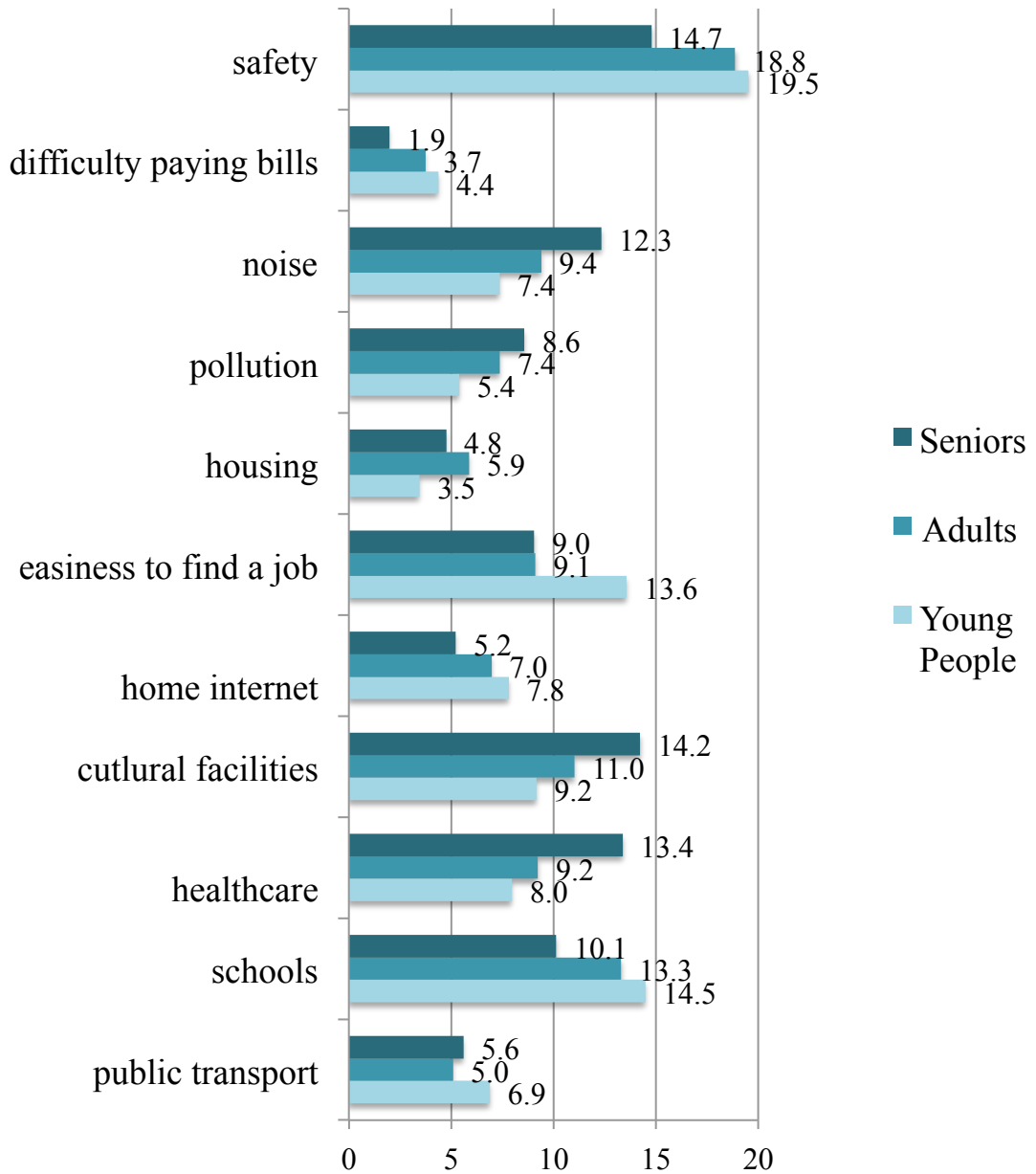
A₁₃, X₁₃: Households with broadband connection (%), gathered from Eurostat statistics. This indicators has been included to test how strongly the weighting will differ for each age group and also to see how strongly it correlates with overall life satisfaction.

A₁₄, X₁₄: Perception of public transport, asked in Eurobarometer survey, '*Generally speaking, please tell me if you are very satisfied, rather satisfied, rather unsatisfied or not at all satisfied with each of the following issues: - Public transport in [CITY NAME], for example the bus, tram or metro.*'

4.3 Weights

Below is a chart describing the results of a Pearson X^2 test. The methodological procedure was described in the Methodology chapter. The whole sample of 24 239 respondents was taken to compute X^2 based on certain homogeneity of European nations, in other words, all the young people, adults starting families and seniors from all countries were put together assuming the age is more significant determinant of their preferences rather than nationality. The X^2 values will be later used as weights for the final scores.

Indicator weights overview



X² scores used as weights, in percentage, own computation

Number of important observations can be made from this chart. The most essential asset people seek is safety and that holds for all age groups, reaching almost 20 percent for young people. Some would expect seniors to be more sensitive to sense of safety but importance of this factor decreases with age.

On the other hand, some of the stereotypes we hold for certain groups have been confirmed. Issue of noise becomes more and more crucial as we get older whereas requirements for good schooling decrease. Demand for good healthcare and cultural facilities also grows with age. Internet availability is, once again as expected, most important for young people.

Interestingly, majority of indicator shows linear relationship with age, the scores for most variables either linearly increase or decrease. The exceptions are public transport which is the least relevant for middle-aged people with families, we could assume this group of people is most likely to use a car most often which would explain that. Families are most sensitive to availability of housing which can be explained by the usual need to settle down and buy appropriate shelter at that time.

The economic factors, represented by easiness to find a job and difficulty paying bills do not correlate strongly with overall satisfaction scores. Difficulty paying bills is a surprisingly small problem for seniors. We could assume that their spending habits have settled over the years and once retired elderly people know how to handle their finances. Easiness or rather difficulty to get a job is most painfully perceived by young people, expectedly so.

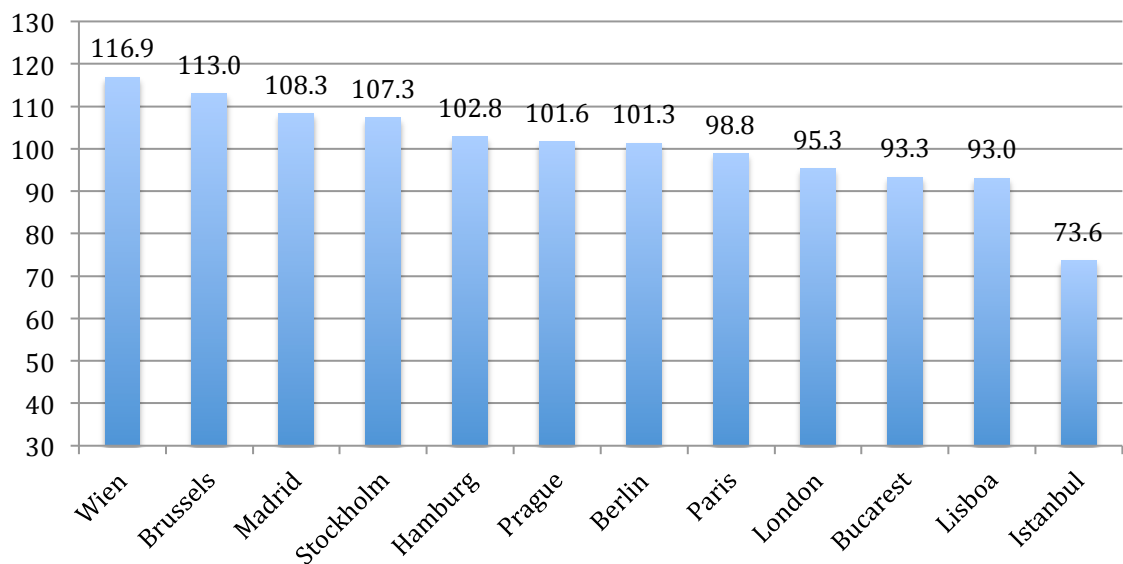
4.4 Satisfaction with living in a given city - computation of city scores

In this part we will use the obtained weights to compute the final scores for each city based on a following formula:

$$\text{QOUL}_{\text{City, Age group}} = X_{1, \text{City}} * A_{2, \text{Age group}} + X_{3, \text{City}} * A_{4, \text{Age group}} + A_{5, \text{Age group}} * X_{5, \text{City}} + A_{6, \text{Age group}} * X_{6, \text{City}} + A_{7, \text{Age group}} * X_{7, \text{City}} + A_{9, \text{Age Group}} * X_{8, \text{City}} + A_{10, \text{Age group}} * X_{10, \text{City}} + A_{11, \text{Age group}} * X_{11, \text{City}} + A_{12, \text{Age group}} * X_{12, \text{City}} + A_{13, \text{Age group}} * X_{13, \text{City}} + A_{14, \text{Age group}} * X_{14, \text{City}}$$

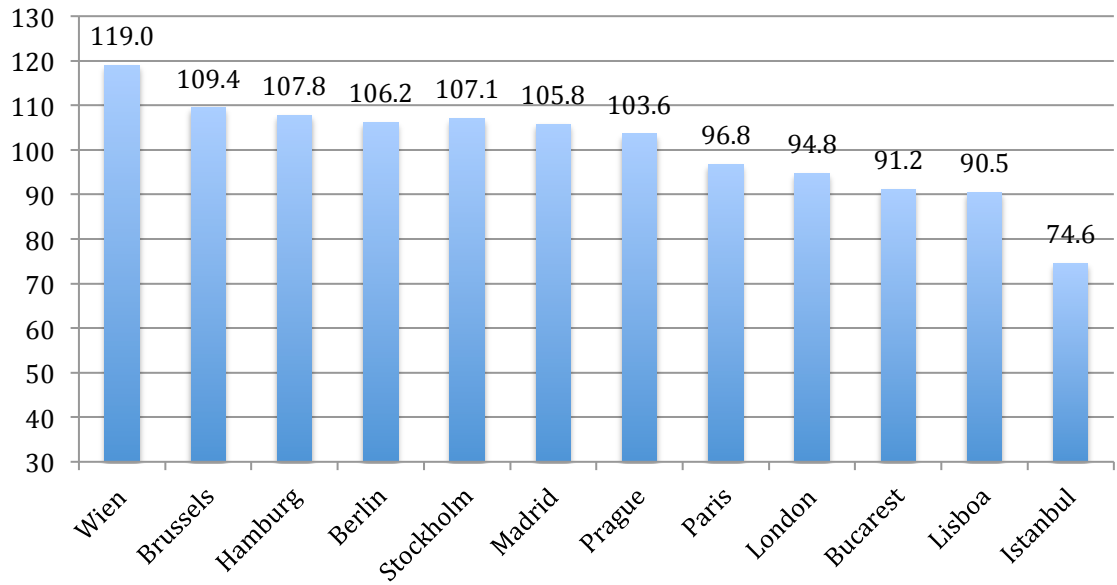
Below are presented charts showing results for three age groups.

QUOL (Young People)



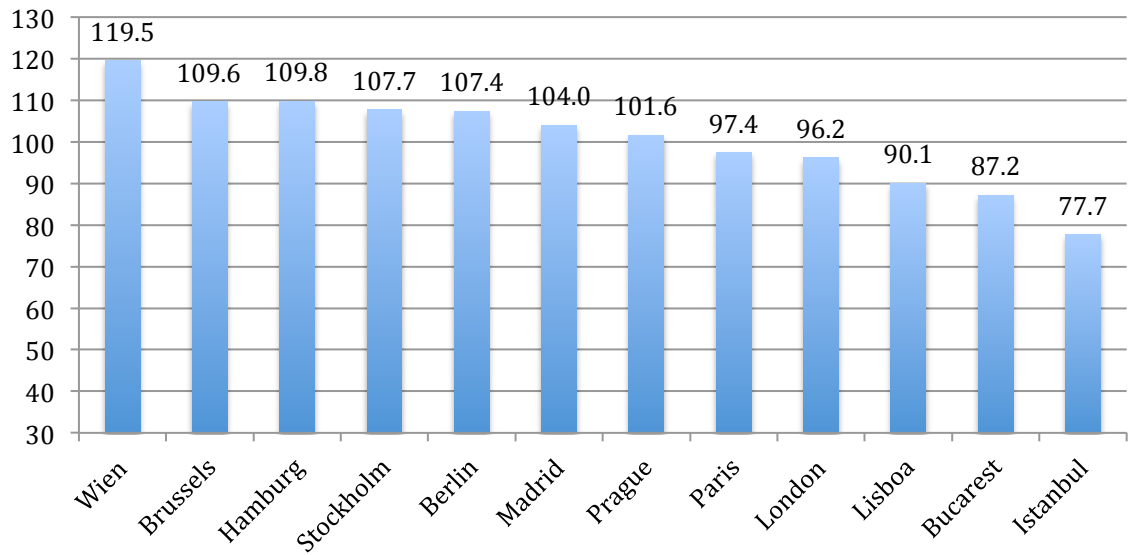
QUOL aggregate scores for young people, points received, own computation

QUOL (Adults)



QUOL aggregate scores for adults, points received, own computation

QUOL (Seniors)



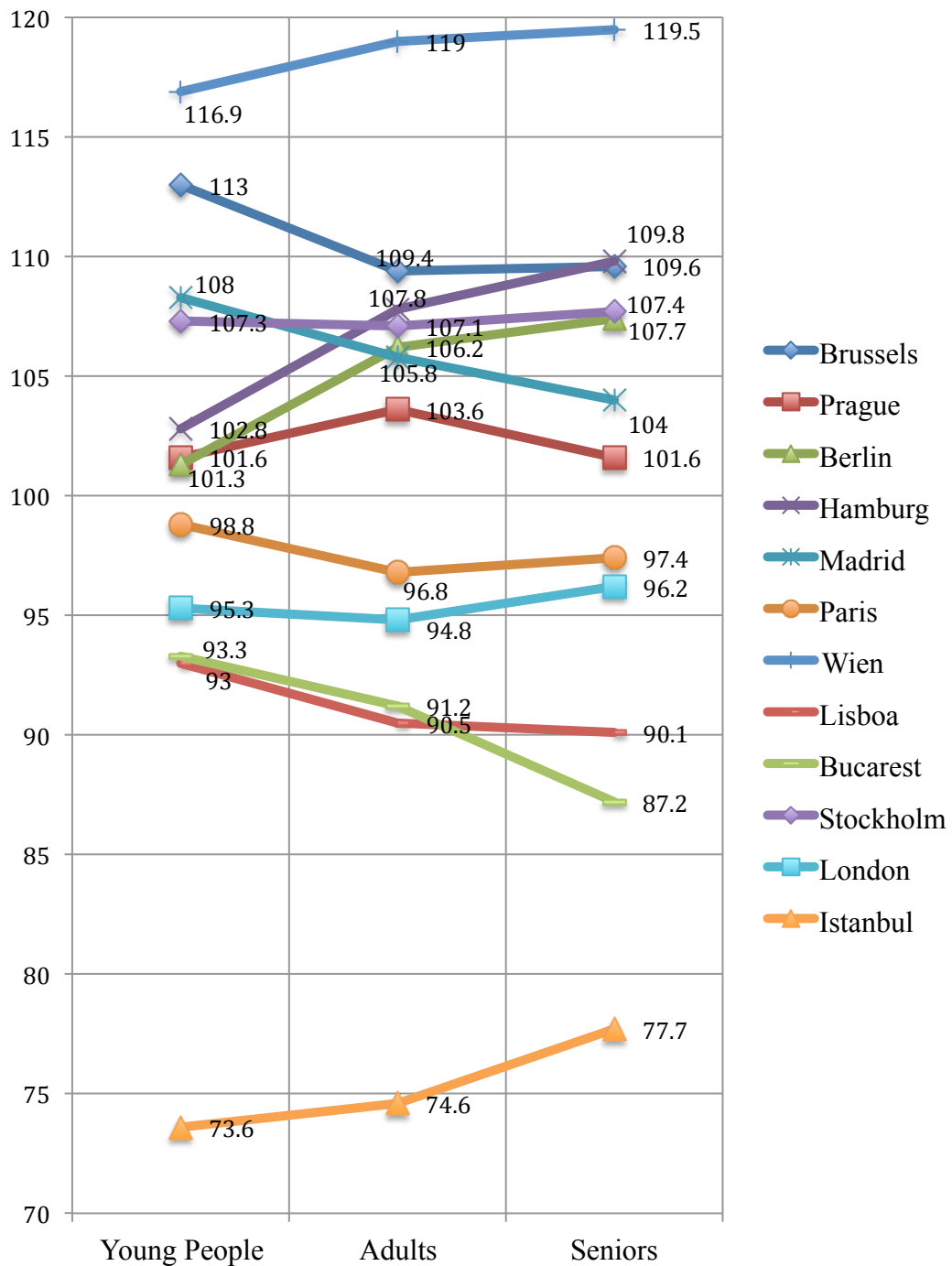
QUOL aggregate scores for seniors, points received, own computation

As shown in the graphs above, dispersion among tested cities is great. Istanbul, the only city outside of European Union, geopolitically and culturally unrelated falls behind in all three age categories. But very surprising are low scores for Lisboa, even in this social – focused index. Wien performed consistently well in all categories, securing first position in all categories.

Surprising are low scores for two very popular European megacities – London and Paris. This shows how distorted image is kept about these cities. As explained in the previous chapter, because of inclusion of city outskirts, the scores are much lower. This is visible through mostly in primary data for London, which is divided in some datasets into Inner and Outer London. Inner London scored almost three times higher average income. Suburban areas clearly don't offer such conditions we usually hold in high regard.

4.5 Interpretation of results

To get a clearer picture of the overall rankings and relations between different age groups, following charts demonstrates the changes among different age categories.



QOUL ordered rankings, own computation

We can clearly see that differences in changing preferences are big enough to cause some reshuffling of rankings. That goes in compliance with the fact that major effect is caused by the actual characteristics of tested cities that are then 'tweaked' by changing preferences. Wien ranked first all over the range, showing slightly weaker scores in economic output and the Internet coverage but even in these categories Wien ranked above average. We can see movement at the second and third place where Brussels is replaced by Hamburg as we move along the age axis. That is caused by better healthcare, cultural facilities and almost two times better perception of noise that is more crucial for elderly people. This dragged Madrid down by four points to sixth place.

Stockholm achieved almost equal scores in all age categories resulting in a flat horizontal line, ranking fourth. Berlin scored fifth and demonstrated similar behaviour as Hamburg. This will be discussed in detail later in the following paragraph. Lisboa and Bucarest achieved similar scores for the first two age groups but for seniors, Lisboa proves to be a much better destination thanks to a better level of healthcare, public transportation. Dead last ended Istanbul with a vast majority of indicators well below other European competitors. Istanbul has also the steepest QOUL curve due to a low percentage of young students residing in the city. The indicators that stand above European average are perceived easiness to find good housing and perceived level of noise.

The last graph also illustrates the development of QOUL across all age categories at a given moment. The steeper the slope is, the bigger the differences exist among age groups. Theoretically, *ceteris paribus*, we can now look at individual cities and read how the QOUL of citizens will change over their lives. Of course, human lifespan is so long it is very likely that most city characteristics will dramatically change as we have learned from history. Nevertheless, these data can be easily updated as long as the European Union will be publishing further issues of their Eurobarometer surveys. Unfortunately, for the latest edition, Eurostat decided to drop the essential question of overall satisfaction with living in a given city. That is why data from 2006 were used to set the weights.

Very striking are very similar results of two German cities, Hamburg and Berlin. These two were chosen on purpose to test relation between a capital city and regional city. As we can see, the scores differ by as little as 1.5 percentage point. This might lead back to the question of importance of national cultures. Even though the preferences (weights of indicators) are taken from aggregated 'European' population (as explained in previous chapters), there is still potential national bias hidden in a way how a given nation perceives and evaluates city life.

It is fair to assume Berlin and Hamburg would be ranked differently due to different size and location but they ended with similar scores. Hamburg has lower unemployment and better public transportation whereas Berlin, famous for its cheap rents, is much better at housing costs. This can be visible specifically at adults group where Berlin sharply rises. It might be a coincidental combination of perceived qualities or this is connected to influence of specific national historic and cultural determinants. Both cities are governed by the same federal government and might be similar in more way that we would imagine. To resolve this issue, another set of cities from the same country would be needed. Unfortunately, the Eurostat data are usually collected for capitals only.

Most of the cities show linear development across three age groups. This reflects the linear nature of majority of weights. The only exceptions, housing and public transportation, along with specific combination of other individual indicators caused non-linear results in cases of London, Paris, Prague and Brussels. Interestingly, three of them have a convex shape (although in case of Brussels we see a minimal change) and one has a concave shape. The remaining 8 cities exhibit linear relationship and it would be possible to calculate expected QOUL at any given age from the set range 15 – 65+. In case of remaining 4 cities, further division into more specific age groups would be required to learn more about the actual QOUL development in relation to age.

4.6 Aggregated city scores

Once we established city scores for three age groups, we can calculate total scores for the selected cities. This will give us a snapshot of aggregated QOUL at a given moment. These results will reflect how well cities accommodate needs and priorities of their citizens.

Firstly, let us focus on distribution of population in selected European cities:

	Young people (%)	Adults (%)	Seniors (%)
European Union (27 countries)	12.4	56.5	31.1
Brussels	13.0	59.1	27.9
Prague	11.3	60.7	28.0
Berlin	11.0	58.2	30.8
Hamburg	10.8	57.3	31.9
Madrid	10.8	61.6	27.7
Paris	14.7	59.9	25.4
Wien	12.2	58.1	29.7
Lisboa	10.5	58.8	30.7
Bucurest	13.1	62.3	24.6
Stockholm	13.4	59.0	27.5
London	30.2	59.8	10.1
Istanbul	21.7	71.2	7.1

Population composition in percentage, 2012, Source: Eurostat statistics

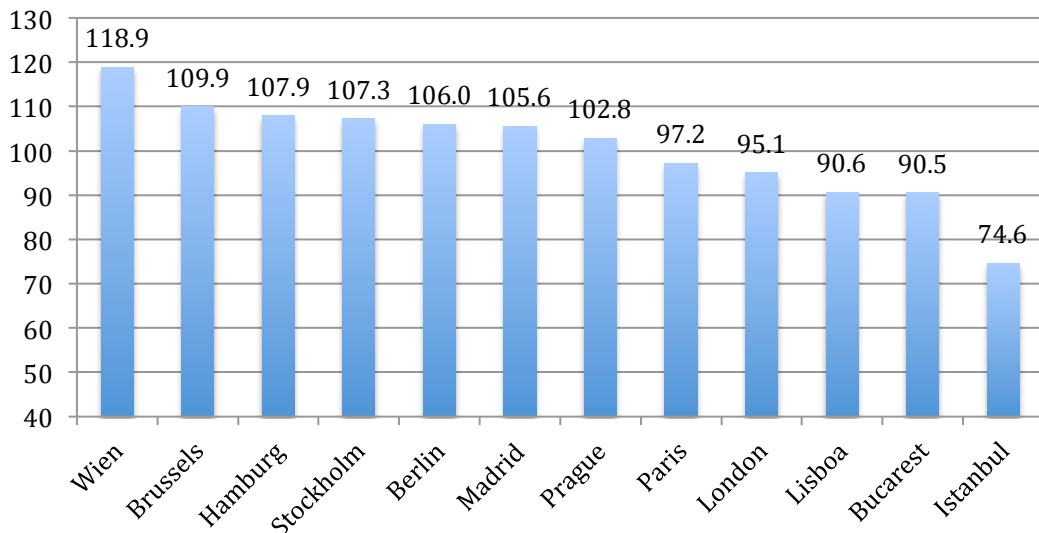
EU average mentioned at the beginning is not only interesting as a European average but it is also the only item that is calculated from the total European population, including smaller towns and countryside. As we can see, majority of big cities have less seniors, except of Hamburg. All of them have higher number of adult people. This chart also clearly illustrated the problem of aging continental Europe faces. Istanbul has less than third of resident seniors. Very surprising is high percentage of young people residing in London.

The following formula is used to calculate aggregate QOUL city scores:

$$\text{QOUL}_{\text{aggregate}} = \text{QOUL}_{\text{city, young people}} * \text{Population distribution}_{\text{city, young people}} + \text{QOUL}_{\text{city, adults}} * \text{Population distribution}_{\text{city, adults}} + \text{QOUL}_{\text{city, seniors}} * \text{Population distribution}_{\text{city, seniors}}$$

Following is a graph showing aggregate city scores in descending order:

QUOL (Whole population*)



QOUL aggregate scores for whole city population, points received, own computation

Compared to previously gathered results, most cities' aggregate score is an average of previous results, strongly correlating with QOUL for adults. This is caused by the linear character of QOUL curve (for most cities), but mainly due to heavy weighting of adult category.

Cities that previously ranked in the middle of chart and overlapped from one age group to other are now clearly ordered: Hamburg, very young people – unfriendly city scored third due to the highest proportion of seniors and exceptionally high QOUL for seniors. The opposite can be said about Madrid, ranking sixth.

5 Conclusion and recommendations

Last chapter of this thesis is dedicated to some of the limiting factors that were set at the beginning of research. This section contextualizes the outcomes of the work by reminding what factors were accounted for and what were omitted. Following are some recommendations on how to overcome them or what effect they would have if these limitations were minimized, possibly in some further research.

5.1 Regional restriction

The subject of research is limited only to European cities due to data availability. Of course, other qualitative studies examining quality of living in other cities are also available but methodology differs. Furthermore, other nations often belong to a different cultural environment and their perception might be different to what Europeans regard as important. It is questionable how well Turkish people, who are dominantly Muslim, share views on good QOUL means to them.

5.2 Children omitted

This research omits interests of European children, specifically 72 million of them. This accounts for 16 % of the EU population. We might argue that their interests are covered by including them into adults category. It would be also difficult to survey young children on such complicated topics. Another, specialized research would be required.

5.3 Relativity of perception

The weighting of individual factors was based on qualitative data – perception of a given phenomenon. People tend to compare their situation to conditions in neighbouring cities or countries. This might be problematic because citizens of Brussels might find their healthcare slightly worse than in Paris even though, in fact, Brussels's is still very

good. On the other hand the *perceived* quality might be more relevant to QOUL than objective state.

5.4 Outdated data

Even though the most up to date data have been used, Eurobarometer survey comes from 2006 when European Union was just realizing how tedious the economic crisis will be. Asking these questions in 2013, people might stress their economic situation more. On the other hand, adjusting peoples' perception on their priorities to every cyclical crisis is impossible and does not reflect reality well. Unfortunately Eurostat decided to drop the crucial question asking about overall satisfaction with living in certain city in their latest Eurobarometer survey. The weighting cannot be computed with newer data but the questions concerning individual factors stayed the same. However, recent EU documents have pledged for stronger focus on measuring subjective well – being so this question might be reintroduced later.

5.5 Main findings and recommendations

This work aimed to look at the issue of perceived quality of urban life from perspective of age in selected European cities. It stresses importance of different lifestyle priorities as people get older. It assumes that cultural and national differences are less relevant (within the European Union, of course) and less determining than our age. It also assumes that selected European cities share common social, cultural and religious values that have been formed during long European history. Literature review also dealt with a relation among terms subjective well - being, happiness, economic prosperity and showed some surprising findings previous researchers came to. It made clear what the difference is between standards of living and wider concept of quality of life.

Selected cities were tested for 11 factors covering broad range from economic situation over pollution to quality of public transportation with data gathered from Eurostat statistics and Eurobarometer surveys. The inhabitants were divided into 3 age groups – labeled as young people (15 – 25), adults (26 – 65) and seniors (66+). In order to assign weights to individual factors and different age groups, statistical testing of contingency tables consisting of satisfaction with certain characteristic and overall satisfaction with living in a tested city was executed based on primary data of a recent survey on quality of living in European cities run on a sample of over 20 000 citizens.

Selected cities were mainly capitals ranging from Lisboa over Istanbul to Stockholm having representatives of ‘old’ Western Europe but also newcomers from Central and Eastern Europe.

The Pearson X^2 test used to determine how closely individual factors relate to overall satisfaction showed that income is of much lower importance than being employed. Apart from the most important aspect, safety, the following three indicators are partly subsidized and locally promoted as publicly funded entities – educational institutions, cultural institutions and provided healthcare. To improve Quality of Urban Life (QOUL) poorly performing cities should set as their priority investing into these areas first.

Most of Pearson X^2 results confirm some of the stereotypes we hold about certain age groups. Education and the Internet is the most important for young people whereas healthcare and noise are critical to elderly. Somewhat surprising is importance of safety – it scored more than twice as high rates than some other indicators. This is a clear hint for any policymaker – if living in a given city is not safe, it affects satisfaction much more than other aspects. Majority of indicator weights proved to be linear – moving along the age axis caused either steady decrease or increase in the magnitude.

These findings were later used to calculate QOUL for each city and each age group. The results can be used as recommendations for students when choosing a university abroad, newly found family when resettling to a different country or seniors enjoying

their retirement elsewhere. The differences in weights among age groups were just large enough to cause certain reordering of final scores as we move from one age category to other, this can be seen in the previous chapter. Wien is perceived so well in all aspects it ended first in all categories despite different age weighting. But the weighting caused changes in following places, moving Madrid from a third place to sixth. But even the most dramatically changing scores for Hamburg equaled to 6 percent change which is not very high. This only confirms the theory where characteristics of the city are slightly adjusted by age preferences.

As we established that age does matter as an important indicator, policy makers can address different age-related issues and set different priorities for different parts of a city. Some larger European cities (Berlin, London) treat certain parts of the city differently and are regarded as one of the most vibrant cities in the world. The effects of this would be reflected in perceived quality in next surveys. It is important to realize different needs of citizens and address those locally rather for the city as whole.

Lastly, these scores were summed together to obtain aggregate scores for selected cities to find out how much satisfaction they offer to their actual citizens residing in the city at the moment. This resulted into a chart similar to adults category thanks to heavy weighting of this age group and also linear relation of weight development.

This research was possible only thanks to thorough work of the EU institutions promoting the idea of a common European space. As it gets easier and easier to travel or move, work and settle down in other European countries for the EU citizens it becomes more crucial to compare living conditions in various European cities.

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7 Apendix – data tables

Table 1: Overview of Eurostat statistics used to calculate QOUL Index, 2012, part 1, Source: Eurostat

	1, primary income of private households (% of EU27 average)	2, life expectancy at birth (years)	3, healthcare personnel, number of practicing physicians per 100 000 inhabitants	4, total number of students in tertiary education divided by resident population aged 20-24yrs	5, employment rate, persons aged 20 - 64 years (%)
Brussels	114.0	76.9	468	130.3	59.2
Prague	94.3	76.4	668	197.2	76.0
Berlin	97.1	77.9	446	67.3	68.8
Hamburg	160.1	78.2	526	75.6	74.9
Madrid	130.6	79.6	442	85.4	69.5
Paris	156.4	79.7	403	71.1	71.2
Wien	132.3	76.8	651	149.7	70.8
Lisboa	99.6	76.3	538	100.5	69.8
Bucarest	91.6	71.8	482	202.9	68.0
Stockholm	145.2	79.7	450	74.7	81.7
London	144.8	79.1	346	59.6	68.4
Istanbul	124.2	73.3	196	27.2	46.9

Table 2: Overview of Eurostat statistics used to calculate QOUL Index, 2012, part 2, Source: Eurostat

	6, unemployment rate, persons aged 15 - 74 years, scale 1-5	7, youth unemployment rate, persons aged 15 - 24 years,	8, households with broadband connection (%)	9, equipment rate for public transport vehicles (number of public transport vehicles per 1 000 inhabitants)	10, number of days ozone concentration exceeded 120 µg/m³
Brussels	5	39.7	65	1.8	19
Prague	1	8.8	62	3.2	20.8
Berlin	5	16.7	75	0.6	18
Hamburg	2	7.4	78	1.1	12
Madrid	5	37.3	66	1.9	24
Paris	3	21.1	80	1.4	6.7
Wien	2	16.4	68	2.4	26.5
Lisboa	4	25.1	59	2.8	8
Bucarest	1	20.3	33	4.9	26
Stockholm	2	21.5	87	1.5	5.8
London	3	21.1	74	2.8	6.7
Istanbul	5	21.9	34	8.8	11

Legend for indicator No. 6 from Table 2

grade	6, unemployment rate, persons aged 15 - 74 years, scale 1-5
1	<= 5.0
2	5.0 – 7.5
3	7.5 – 10.0
4	10.0 – 12.5
5	>= 12.5

Table 3: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Generally speaking, please tell me if you are very satisfied, rather satisfied, rather unsatisfied or not at all satisfied with each of the following issues: - Public transport in [CITY NAME], for example the bus, tram or metro.	% Very satisfied	% Rather satisfied	% Rather unsatisfied	% Not at all satisfied	% DK/NA
Brussels	17.8	47.2	16.4	9.7	8.8
Prague	28.8	52.9	9.1	4.9	4.3
Berlin	25.5	42.9	17.5	7.7	6.4
Hamburg	39.4	47.5	6.8	2.2	4.1
Madrid	22.4	56.3	13.7	3.8	3.8
Paris	21.7	60.8	11.2	4.0	2.3
Wien	53.1	37.5	4.7	2.3	2.4
Lisboa	11.7	54.2	14.5	6.4	13.1
Bucarest	7.5	39.3	26.0	17.0	10.2
Stockholm	37.4	49.9	6.5	1.8	4.3
London	27.6	48.0	12.3	6.5	5.5
Istanbul	15	46	14	16	10

Table 4: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Generally speaking, please tell me if you are very satisfied, rather satisfied, rather unsatisfied or not at all satisfied with each of the following issues: - Health care services offered by doctors and hospitals in [CITY NAME].	% Very satisfied	% Rather satisfied	% Rather unsatisfied	% Not at all satisfied	% DK/NA
Brussels	36.5	49.5	6.7	3.2	4.1
Prague	25.9	51.5	13.4	4.9	4.3
Berlin	35.9	47.5	11.8	2.2	2.6
Hamburg	44.6	41.9	9.5	2	2.1
Madrid	18.8	49.7	21.4	6.9	3.2
Paris	21.8	56.6	10.7	3	7.9
Wien	55.2	36.7	5.4	0.7	1.9
Lisboa	11.1	52.3	18.5	11.7	6.3
Bucarest	7.4	30.4	26.3	28	7.8
Stockholm	36.1	49.7	6.4	1.5	6.3
London	32.1	46.4	9.9	7.4	4.2
Istanbul	24.5	44	14.8	14.3	2.4

Table 5: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Generally speaking, please tell me if you are very satisfied, rather satisfied, rather unsatisfied or not at all satisfied with each of the following issues: - Cultural facilities in [CITY NAME] such as concert halls, theatres, museums and libraries.	% Very satisfied	% Rather satisfied	% Rather unsatisfied	% Not at all satisfied	% DK/NA
Brussels	31.3	48.6	5.2	2.4	12.5
Prague	40.1	46	4.7	1.5	7.7
Berlin	68	26	1.9	1.1	3.1
Hamburg	63.1	28	3.9	0.6	4.5
Madrid	26	55.7	9.2	2.6	6.4
Paris	54.9	38.1	3.1	0.8	3.1
Wien	74.1	20.7	1.1	0.2	3.9
Lisboa	17.1	54.5	9.6	2.6	16.2
Bucarest	17.5	49.8	9.9	8.7	14.1
Stockholm	59.7	32.7	2.4	0.8	4.4
London	62.9	28.1	2.8	1.4	4.8
Istanbul	24.5	32.4	9	7.8	26.2

Table 6: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with each of these statements? - In [CITY NAME], it is easy to find a good job	% Very satisfied	% Rather satisfied	% Rather unsatisfied	% Not at all satisfied	% DK/NA
Brussels	4.2	18.6	31	18.1	28.2
Praha	16.2	40.2	20.7	10.4	12.5
Berlin	0.8	16.3	50.2	18.2	14.6
Hamburg	4.9	42.7	28.5	6.9	17.1
Madrid	2.1	18.5	45.6	28.5	5.3
Paris	3.5	34.6	29.2	18.7	14
Wien	7.8	29.3	27.6	10.8	24.5
Lisboa	1.1	13.3	22.1	54.6	8.9
Bucarest	8.9	21.6	19.9	39.7	9.8
Stockholm	22.9	38.2	14	7.6	17.4
London	9.9	31.7	24.1	21.7	12.5
Istanbul	5.9	10.2	26.9	54.4	2.5

Table 7: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with each of these statements? - In [CITY NAME], it is easy to find good housing at a reasonable price.	% Very satisfied	% Rather satisfied	% Rather unsatisfied	% Not at all satisfied	% DK/NA
Brussels	2.7	14.4	32.5	38.3	12.1
Prague	5.3	21.3	28.9	36.8	7.7
Berlin	14.2	36.8	31.5	9	8.5
Hamburg	2.8	12.8	48.4	25.6	10.3
Madrid	5.8	27.1	30.6	15.6	20.9
Paris	0.4	2.3	19.3	76.6	1.4
Wien	2.3	17.2	34.4	32.1	13.9
Lisboa	1.8	7.7	20.3	64.2	5.9
Bucarest	5.8	11.9	20.3	55.5	6.6
Stockholm	3.1	11.4	34.7	45.2	5.6
London	3.8	10.3	21.3	60.4	4.2
Istanbul	8.2	17.1	29.7	42.4	2.6

Table 8: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with each of these statements? - In [CITY NAME], air pollution is a big problem.	% Very satisfied	% Rather satisfied	% Rather unsatisfied	% Not at all satisfied	% DK/NA
Brussels	29.9	46.1	16.9	4.5	2.5
Prague	30.5	43.2	21.3	3.4	1.8
Berlin	17.4	31.8	38	8.7	4.1
Hamburg	8.8	24.5	46.5	14.9	5.4
Madrid	39.2	45.6	11.9	2.7	0.6
Paris	41.3	36.3	15	4.8	2.6
Wien	13.9	26.8	42.5	14.8	2
Lisboa	49.2	35.6	11	3.2	1.1
Bucarest	83.3	8.7	2.6	3.5	1.9
Stockholm	25.8	44.5	18.3	8.2	3.2
London	41.7	35.3	14	5.2	3.8
Istanbul	45.9	26	19.8	7.4	0.9

Table 9: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with each of these statements? - In [CITY NAME], noise is a big problem.	% Very satisfied	% Rather satisfied	% Rather unsatisfied	% Not at all satisfied	% DK/NA
Brussels	22.7	42.6	23.2	9.4	2.1
Prague	33.8	41.7	18.5	5.4	0.6
Berlin	22	37	31.5	7.9	1.5
Hamburg	11.5	32.8	41.7	11	3.1
Madrid	42.3	41.7	12.6	2.6	0.8
Paris	38.5	33.3	20.6	7	0.6
Wien	18.6	33.1	34.9	12	1.5
Lisboa	44.2	35.3	15.6	3.6	1.3
Bucarest	72.7	15.5	5.8	5	0.9
Stockholm	22.8	42.3	22.4	11	1.5
London	40.1	32	18.2	8	1.6
Istanbul	54.6	26.6	14.7	3.9	0.2

Table 10: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Please tell me, if this always, sometimes, rarely or never happens to you? - You have difficulty paying your bills at the end of the month.	% Always	% Sometimes	% Rarely	% Never	% DK/NA
Brussels	4.6	23.5	11.3	52.3	8.2
Prague	4.8	10.4	15.7	65.1	4
Berlin	4.1	15.5	13.7	63.1	3.7
Hamburg	3.4	12.7	14.1	67	2.8
Madrid	4.2	19.8	17.1	57	1.9
Paris	2.9	22.4	15.2	55.7	3.8
Wien	1.3	12.9	10.2	71.9	3.7
Lisboa	5.4	21.5	16	51.1	6
Bucarest	4.4	20.2	15.7	57.7	2
Stockholm	1	7.2	9.2	78.8	3.9
London	6.4	23.8	19.6	47.9	2.2
Istanbul	30.1	34.6	10.8	23.4	1.1

Table 11: Eurobarometer No. 194 results used to calculate QOUL Index, 2006, Source: Eurostat

Please tell me, if this always, sometimes, rarely or never happens to you? - You feel safe in [CITY NAME].	% Always	% Sometimes	% Rarely	% Never	% DK/NA
Brussels	33.2	36.1	14.3	15.3	1.1
Prague	30.4	34.7	21.9	12.3	0.7
Berlin	50.9	37.1	8.5	3.4	0.2
Hamburg	59.6	33.8	4.9	1.6	0.2
Madrid	46.8	39.8	8.5	4.9	0
Paris	51.9	38.9	5.7	3.3	0.3
Wien	62.6	27.5	6.7	3	0.2
Lisboa	34.1	43.7	11.4	10.7	0.2
Bucarest	25.2	35.8	14.9	22.2	2
Stockholm	63.9	32.6	2.5	0.8	0.2
London	32.4	54.7	7.8	4.7	0.4
Istanbul	20	29.6	11.3	38.9	0.1