City Life: Rankings (Livability) vs Perceptions (Satisfaction).

Adam Okulicz-Kozaryn *

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Abstract

I investigate the relationship between the popular Mercer city ranking (livability) and survey data (satisfactions). Livability aims to capture <u>objective</u> quality of life such as infrastructure. Survey items capture <u>subjective</u> quality of life such as satisfaction with city. The relationship between objective measures of quality of life and subjective measures is weak (correlation of about 0.4). Trust is highly correlated with both, objective livability (0.8) and subjective satisfaction with city (0.65). I postulate to pay more attention to subjective indicators of quality of life. After all, what matters is what we perceive, not what is out there.

KEYWORDS: SATISFACTION, WELL-BEING, CITIES, CITY RANKINGS, LIVABILITY, URBAN QUALITY OF LIFE, PERCEPTIONS SURVEY, BEST PLACES TO LIVE, MERCER, URBAN AUDIT

1 Introduction

You have probably seen lists titled "best places to live". Another popular term is "livability". Livability indices rank cities in terms of their "livability". Webster dictionary defines livability as "suitability for human living". Livability means quality of life, standard of living or general well-being of a population in some area such as a city. An obvious problem with "livability" is that it means something different to different people. More about this later. How do we measure livability ? There are many ratings/rankings of the cities:

- http://whosyourcity.com,

- http://www.gallup.com/poll/145913/city-wellbeing-tracking.aspx,

- http://www.gallup.com/poll/146645/Boulder-Colo-Leads-Metro-Areas-Wellbeing.aspx

- http://www.economist.com/blogs/gulliver/2011/02/liveability_ranking

- http://www.mercer.com

- and so forth

Mercer index is probably the most popular[1].

Why is livability important? It is important for people. Livability is a measure of objective quality of life (I will define it later). People living in livable cities are happy. According to livability theory objective conditions such as infrastructure matter for subjective wellbeing (Veenhoven and Ehrhardt 1995). Hence, in livable cities people are supposed to be happy. Furthermore, if you live in a livable city where most people are happy, you are likely to become happy as well. Fowler and Christakis (2008) found that happy people make others happy. Livability is important for businesses[2] – happy people are better workers (Lyubomirsky et al. 2005). Livability is important for city governments, because livable cities attract good workers and businesses, and business activity is the key for city development (Economist 2011b,a).

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[1]"The Economist and Forbes base their rankings primarily on data from the Mercer consulting company"(http://www.livablecities.org/blog/value-rankings-and-meaning-livability). Kotkin (2011) claims that the Economist ranking is "remarkably similar" to Mercer.

[2]In fact, we have the livability ratings because they are produced for businesses. Companies producing livability lists like Mercer sell them to businesses.

Which cities are livable ? Table 6 shows ten most livable cities in the World according to the Mercer index.[3] I am surprised with this list and probably many people are. There are no U.S. cities among the top ten (even among top thirty) and majority are European. Is Vienna really the best city on the planet ?

Mercer's City Ranking Tables		
City	Country	Rating
Vienna	Austria	108.6
Zurich	Switzerland	108
Geneva	Switzerland	107.9
Vancouver	Canada	107.4
Auckland	New Zealand	107.4
Dusseldorf	Germany	107.2
Frankfurt	Germany	107
Munich	Germany	107
Bern	Switzerland	106.5
Sydney	Australia	106.3

Table 1: Top 10 cities in 2010

It is important to study cities because more people live in cities each year. The livability of cities determines in greater and greater proportion livability of countries. Table 2 shows the urbanization process in Western Europe. Almost three quarters of Europeans live in urban areas, and in 25 years it will be 80 % of Europeans. And cities produce much larger proportion of economic output, innovation and research than its share of population (Glaeser 2011).

Year	Percentage urban
1950	51.2
1960	56.9
1970	62.8
1980	68.0
1990	70.5
2000	71.4
2010	72.6
2020	74.8
2030	77.8
2040	81.0
2050	83.8

Table 2: Urban population in Europe; Source: `http://esa.un.org/unup/`

A well known fact is that European society is aging and that it needs either higher fertility rates or/and more immigrants to support its global competitiveness and welfare. Another demographic pattern of interest to researchers and policymakers is that immigrants usually settle down in the cities. International migration makes up a third of cities growth in Europe (European Research Area 2010). Hence, it is important to study how cities integrate newcomers from foreign countries (more on this in the results section).

Let's return to city rankings. There are many city rankings and estimates of livability, but what exactly is livability ? What are its components, how we define those components ? According to the Economist (Economist 2011b,a) livability is job opportunity – 90% of people move to cities for a job, and so enhancing city's competitiveness in the market for talent should be at the top of the list for city governments. Job demand increases job supply, and job supply increases job demand in a virtuous cycle – people move to cities for jobs and businesses move to cities for talent. Human capital (talent) is what matters for cities (Florida et al. 2010). Other components of livability are following(Economist 2011b):

- cost of living

- public transport and roads

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[3]There are more ratings here: `http://www.mercer.com/press-releases/quality-of-living-report-2010#City_Ranking_Tables`.

- safety and security

- culture and nightlife

The above components mostly measure infrastructure, institutions, and comforts. But city is more than that: city is made of people who live in it. People are willing to move to the very expensive cities like New York to be around other people: these places have great creativity, innovation, and so forth. Still, while New Yorkers are proud to live in New York, they are unhappy to live in New York at the same time (Balducci and Checchi 2009). They pay a lot for small and old housing, crowded commute, noise, congestion, and so forth. All these costs indicate how much newcomers are willing to pay to live in the "top cities". Location does matter – where you live determines not only your job prospects, but also mating prospects, creative and innovative thinking (Florida 2008), opinions and ideology (Bishop and Cushing 2009), and so forth.

Cities are different on many subtle dimensions. We can say that cities "have personalities" and we can measure those personalities. Which city personalities are good for you ? Florida (2008, p. 196) argues that you are most happy if you live among curious, open and tolerant people.[4] Still, infrastructure is a basic necessity. For instance, people cannot be happy in a city without good transportation, schools, and hospitals. While these are necessary, however, they are not sufficient. Following a famous Maslow (1987) pyramid of needs, Florida (2008) suggests a pyramid of needs in a city (figure 1).
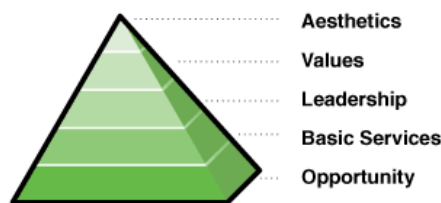

Figure 1: Place Pyramid, (Florida 2008, p 294).

There are many characteristics that make city worthwhile: education, health and safety, housing, getting around (commuting), but also less obvious things like values: e.g. tolerance, trust, self-expression (Florida 2008, p 297). Inglehart (1997) pictured the same concept in figure 2. At low levels of economic development economic gains or material goods matter – people need to satisfy their basic needs such as shelter or food. But once the basic needs are satisfied, there develop higher level needs related to life-style such as self-expression.

The point is that city rankings focus on objective factors, such as transportation and health care, and yet the city rankings are mostly made for the cities in the developed world, where objective factors matter the least. What matters are the subjective factors such as openness, trust, creativity, innovation, and so forth. Now, the question is whether there is an overlap between the objective quality of life and the subjective quality of life that is left out from the indices. This study attempts to answer this question.[5]

2   Rankings (livability) vs Perceptions (satisfactions)

Let's have a closer look at the concept of quality of life. Quality of life can be defined in objective terms, e.g. Per Capita Gross Domestic Product. Quality of life can also be defined in subjective terms, e.g. self-reported life satisfaction and other subjective, self-reported perceptions.

There is evidence that quality of life is connected to the perceptions, feelings, and subjective values, or even that quality of life is perceptions and feelings (Senlier et al. 2009). And there seems to be a consensus among social scientists that indicators of subjective quality of life add to our understanding of broadly defined development (Diener and Suh 1997, Cummins 2000, Stiglitz et al. 2009).

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[4]Curiosity, openness and tolerance contribute to the key ingredient of well-being (social capital). Yet, on the other hand, diversity hinders social capital (Putnam 2007).

[5]There were at least two attempts to answer this question: Schneider (2005) and Diener and Suh (1997). These researchers, however used different data and focused on different geographical locations. I focus on Europe and use new data.
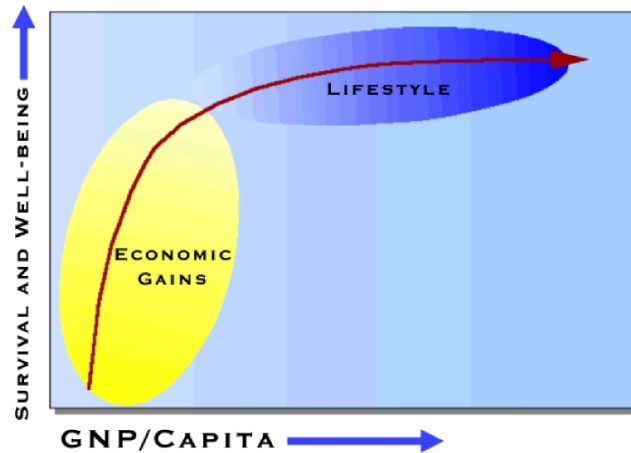
Figure 2: Well-being and income, (Inglehart 1997).

This consensus has developed at the country-level so far. Yet amidst the proliferation of city rankings focused on objective qualities, there is not much discussion of the subjective side of quality of life in cities. Again, it is not the objective quality of infrastructure but how people perceive it that matters (Senlier et al. 2009). For instance, it is not only transportation, but how people are satisfied with it; not only actual crime, but how people feel about it. After all what determines the actual (experienced) quality of life is what people feel, not what they expect.[6] The great advantage of the subjective indicators is that they capture experiences that are important to residents of a city, not to the experts who construct livability indices.

We can define the difference between standard of living and the quality of of life. Quality of life is a broader concept than standard of living. Quality of life is general or overall well-being, which in addition to material well-being (standard of living or livability) includes non-material ingredients such as freedom, tolerance, self-expression, and so forth. Standard of living is a level of material comfort in terms of goods and services such as health care, clean water, education, houses, apartments, telephones, food, clothing, paved roads, computers and so forth.

Livability rankings measure standard of living, not the quality of life. Mercer themselves admit: "One may live in the highest ranked city in terms of quality of living [standards] and still have a very bad quality of life because of unfortunate personal circumstances (illness, unemployment or loneliness, etc)."[7]. But there are also city-level qualities, like general level of trust, tolerance, creativity, and so forth, that determine quality of life. And again, those become more important in wealthier countries. I study here European cities that are quite wealthy and developed as compared to other cities in the world.

So far I have argued that the subjective and objective quality of life is different, and that livability indices try to capture the objective part omitting the subjective part. Let's add a third concept: normative quality of life.

Figure 3 shows the relationship between normative, objective, and subjective quality of life. They are distinct concepts, but there is an overlap. Normative quality of life refers to ideals, i.e. what we believe to be a good life. Many philosophers, notably Aristotle, produced a list of things that comprise quality of life. Objective quality of life refers to some objective (not self-reported) qualities of the world, e.g., Per Capita Gross Domestic Product (PCGDP). Subjective quality of life is a self-reported assessment, for instance happiness that can be measured using questions such as "All things considered, how satisfied are you with your life as a whole these days?" Livability is composed of objective qualities such as transportation, but weighted in a normative way. [8]

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[6]There is a systematic difference between what we think to influence our quality of life and what actually does. For a further discussion of the difference between expected and experienced utility see Kahneman and Sarin (1997), Schkade and Kahneman (1998), Kahneman (2000), Kahneman and Krueger (2006).

[7]http://www.livablecities.org/blog/value-rankings-and-meaning-livability

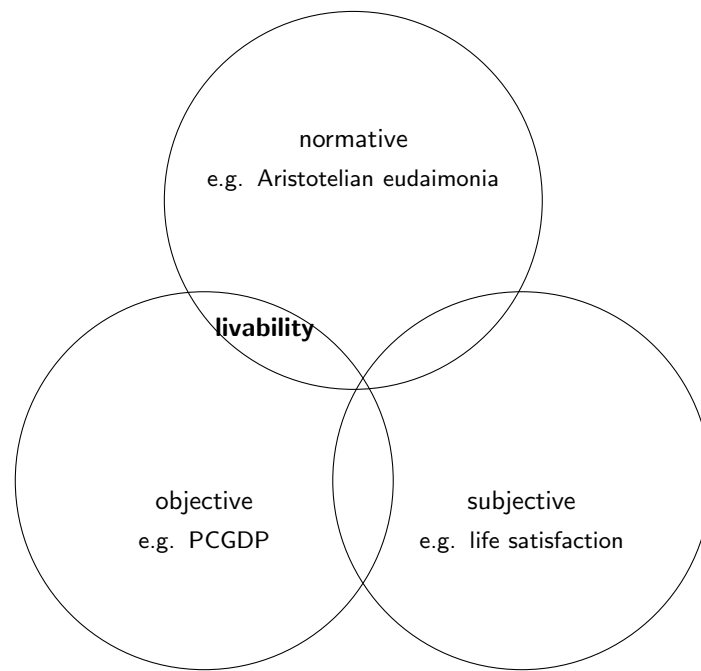[8]For a further discussion see Diener and Suh (1997) and Schneider (2005).

Figure 3: Livability in relation to normative, objective and subjective qualities of life.

It is meaningful for a person to look at the objective indicators of quality of life. You can look at median income, housing prices, physicians and crime per 1000 people and so forth and figure out what matters to you. It is also meaningful to look at the subjective quality of life. It is good to live in a place where people are happy. If people are satisfied with transportation and schools, there is a good chance that you will be satisfied as well. Normative quality of life is best left to the philosophers. How about livability?

My point is that the livability rankings do not capture the objective quality of life, but rather distort it. If fact, if you think about it, there is no such a thing as livability. Livability is an artificial construct calculated by experts based on normative ideals according to some philosophical system. By using normative ideals experts assign weights to the objective characteristics to produce the livability index. For instance they make an index to contain $4 *$ "public transportation quality" $+ 2 *$ "quality of schools" and so forth. [9] Livability indices may be helpful if you agree with the people who produce an index on what is important for quality of life. But livability indices are more likely to be confusing. For instance, among 329 U.S. metropolitan areas there were 59 that could be ranked either first or last depending on a weight given to the same variables (Diener and Suh 1997, p. 197).[10]

Historical heritage, green spaces, safety, lots of bicycles and so forth are regarded as increasing quality of life in some arbitrary proportion because experts believe so; not because people who live there feel that way. Schneider (2005) found no relationship between self-reported life satisfaction and objective qualities of cities in the U.S. and concluded that the objective indicators of quality of life are "suspect". Along these lines Forbes magazine criticizes livability rankings (Kotkin 2011):

> Yet are those the best standards for judging a city? It seems to me what makes for great cities in history are not measurements of safety, sanitation or homogeneity but economic growth, cultural diversity and social dynamism. A great city, as Rene Descartes wrote of 17th century Amsterdam, should be "an inventory of the possible," a place of imagination that attracts ambitious migrants, families and entrepreneurs.
>
> Such places are aspirational–they draw people not for a restful visit or elegant repast but to achieve some sort of upward

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[9]And so is artificial the popular Human Development Index (HDI), because it is a weighted average of income, life expectancy and education. HDI is measuring objective qualities, but in a normative way. Experts assign weights to each component based on their normative ideals.

[10]Mercer claims on its website (`http://www.mercer.com/referencecontent.htm?idContent=1380465`) that "Given that basic individual needs are quite general, it is fairly unlikely that the quality of living components listed by two different individuals will differ to any great extent; what is more likely is that certain criteria of quality of living will have greater weighting than others at a given moment or in certain situations." I would say that most of the components will have different weighting, and some of them will be different. Another confusing statement from the same website says: "In fact, Quality of Life may involve a subjective assessment or opinion, whereas Mercer's criteria are objective, neutral and unbiased."

mobility. By nature these places are chaotic and often difficult to navigate. Ambitious people tend to be pushy and competitive. Just think about the great cities of history–ancient Rome, Islamic Baghdad, 19th century London, 20th century New York–or contemporary Los Angeles, Houston, Shanghai and Mumbai.

To capture subjective quality of city life I will use several measures including trust. Trust is one of the key predictors of well-being (Heukamp and Arino 2011). In addition to a direct effect of trust on well-being, trust is a key component of social capital, and social capital is a key component of well-being (Putnam 2001). Trust also predicts postmaterialist values which would be at the top of Florida's pyramid in figure 1 and the top right of Inglehart's curve in figure 2.

Trust is also one of the most successful subjective indicators in economic modeling. It predicts economic development, trade, entrepreneurship and stock market participation (Knack and Keefer 1997, Guiso et al. 2006). Hence, trust should predict both (objective) livability and (subjective) satisfaction with city.

3 Data

I measure subjective quality of life with survey answers in Urban Audit Perceptions Survey (UAPS). Data come from `http://epp.eurostat.ec.europa.eu/portal/page/portal/region_cities/city_urban/data_cities/database_sub1`. UAPS was conducted in 2004, 2006, and 2009. I take the mean for each city over time to get a more stable estimate. In any given year perceptions may be influenced by some event.[11] I will use survey items shown in table 3.

variable	question
"I will read you a few statements. Please tell me whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree with each of these statements?"	
city	"You are satisfied to live in [city name]"
foreigners	"The presence of foreigners is good for the city"
trust	"Generally speaking, most people in the city can be trusted"

Table 3: Survey questions in UAPS.

Questions were answered on 4-point scale: strongly agree, somewhat agree, somewhat disagree, and strongly disagree. In what follows I will use a synthetic index, which is a proportion of those who agree (strongly and somewhat) to those who disagree (strongly and somewhat) adjusting for nonresponse.[12]

In addition to UAPS data, I use Mercer city rankings. Again, Mercer calculates its livability index according to 39 factors, grouped in 10 categories. Mercer questioned expatriates on the importance of each of the 39 issues. The weights assigned to each category are as follows:[13]

1. 23 Political and social environment (political stability, crime, law enforcement, etc)

2. 4 Economic environment (currency exchange regulations, banking services, etc)

3. 6 Socio-cultural environment (censorship, limitations on personal freedom, etc)

4. 19 Health and sanitation (medical supplies and services, infectious diseases, sewage, waste disposal, air pollution, etc)

5. 3 Schools and education (standard and availability of international schools, etc)

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[11] For instance, in Rennes a metro line was opened in 2002 and this explains why Rennes in 2004 has the highest share of satisfied residents with public transportation `http://www.urbanaudit.org/UAPS%20leaflet.pdf`. In later years ratings of public transportation in Rennes dropped.

[12] There seems to be no documentation about synthetic index calculation and I was unable to obtain information from Eurostat. However, synthetic index is almost the same as proportion of respondents who agree (strongly and somewhat) to those who disagree (strongly and somewhat) with correlations of more than 0.95.

[13] I obtained weights by contacting Mercer. Mercer data can be found at: `http://www.businessweek.com/interactive_reports/livable_cities_worldwide.html` There are indices for 2006 and 2007 and they correlate at 0.99, and I just use a values for 2006. A full list of 39 factors is in the appendix. Additional information is available here: `http://www.citymayors.com/features/quality_survey.html#Anchor-Europe-11481`

6. 13 Public services and transportation (electricity, water, public transport, traffic congestion, etc)

7. 9 Recreation (restaurants, theaters, cinemas, sports and leisure, etc)

8. 11 Consumer goods (availability of food/daily consumption items, cars, etc)

9. 5 Housing (housing, household appliances, furniture, maintenance services, etc)

10. 6 Natural environment (climate, record of natural disasters)

Keeping in mind the criticism of livability from the previous section, the weights seem arbitrary, and they would be different for different people. To be fair, I must note that the Mercer index may be actually quite useful for expatriates. The reason is that weights are based on expatriates evaluations. So other expatriates may get useful information assuming that all expatriates would assign similar weights. Still, everybody is different and there will be differences among expatriates, too. And the above weights make almost half of the index to be political and social environment and health and sanitation. At the same time there is no job opportunity on the list. Again, Economist (2011b,a) stresses that jobs are the most important for cities, and people think the same – when asked for the most important thing for their city in UAPS– they tend to say job creation/unemployment.[14]

More information about Mercer rankings can be found at `http://across.co.nz/qualityofliving.htm`, which is quoted in the next two paragraphs,

The survey was conducted to assist multinational companies in assessing comparative international quality of living standards for their expatriate workers. Cities were ranked with New York as the base city with a score of 100. Compared with the top four cities, which each score 106, the least desirable cities are Brazzaville and Pointe Noire in Congo which score 23 and 30.5 respectively, and Khartoum and Baghdad which each score 33.

The European regional rankings emphasize the difference in living conditions between Eastern and Western Europe, although the gap is narrowing. Western Europe has three of the world's four highest-ranking cities (Zurich, Vienna and Bern), and 12 of the top 20. Switzerland has three of the highest-scoring cities - Zurich (106), Bern (106) and Geneva (105.5) while Germany also has three cities in the top 20 - Frankfurt (104), Munich (104) and Dusseldorf (103.5). Amongst the high-scoring cities are Copenhagen (105.5), Helsinki (104.5), Amsterdam (104.5), Oslo (103.5) and Brussels (103.5). Paris (102.5) is ranked in joint 24th position while London (101.5) is in joint 34th position. In Eastern Europe, Budapest (91) Prague (88.5) and Warsaw (83) have risen significantly in the rankings. By contrast, Belgrade (39), Tashkent (44.5), Sarajevo (44.5) and Almaty (46.5) appear near the bottom of the table due to the instability of the region. Moscow (57.5), St Petersburg (58) and Kiev (58.5) also score badly on the issues of political stability, personal safety and health.

4   Results

One would expect that residents are satisfied with livable cities and dissatisfied with unlivable cities, but this relationship is weak. On the other hand, subjective and objective indicators measure different things and we would expect a weak correlation (Cummins 2000).[15] The correlation between overall satisfaction with city and Mercer index is only 0.36 (significant at 0.05 level of significance). It would be beneficial to conduct perceptions survey in more cities and to publish both, objective and subjective city rankings. Both are important, and as shown here they are different. A scatterplot of Mercer index against satisfaction with the city is shown in Figure 4.[16]

There is a cluster of cities, whose residents are both satisfied to live there and whose livability based on Mercer index are high. These are the cities with a proportion of satisfied residents over 90% and Mercer over 100, which is the benchmark for New York City. These cities are the following: Amsterdam, Barcelona, Copenhagen, Hamburg, Helsinki, Luxembourg, Munich, Stockholm, Vienna.

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[14]`http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/urban/survey2009_en.pdf`

[15]Cummins (2000) further argues that the poorer the objective conditions the higher the correlation between the objective and subjective measures. Unfortunately, I cannot test this proposition here because European cities have good objective quality of life. But good objective quality of life may explain low correlation with subjective measures per Cummins (2000).

[16]Again, I will use a synthetic index.

On the other side of the distribution, there is much less consistency. Athens are the most miserable city in terms of people's perceptions, but Mercer ranks Athens only slightly below the average for this sample. Another set of outliers is several capitals that are highly ranked by Mercer but not that happy when people are asked about they perceptions: Berlin, Brussels, Dublin, Lisbon, Madrid, and Paris. Finally, people in Zagreb are very satisfied (95%), yet Mercer rates Zagreb much lower than Athens, where only 65% of people are satisfied.
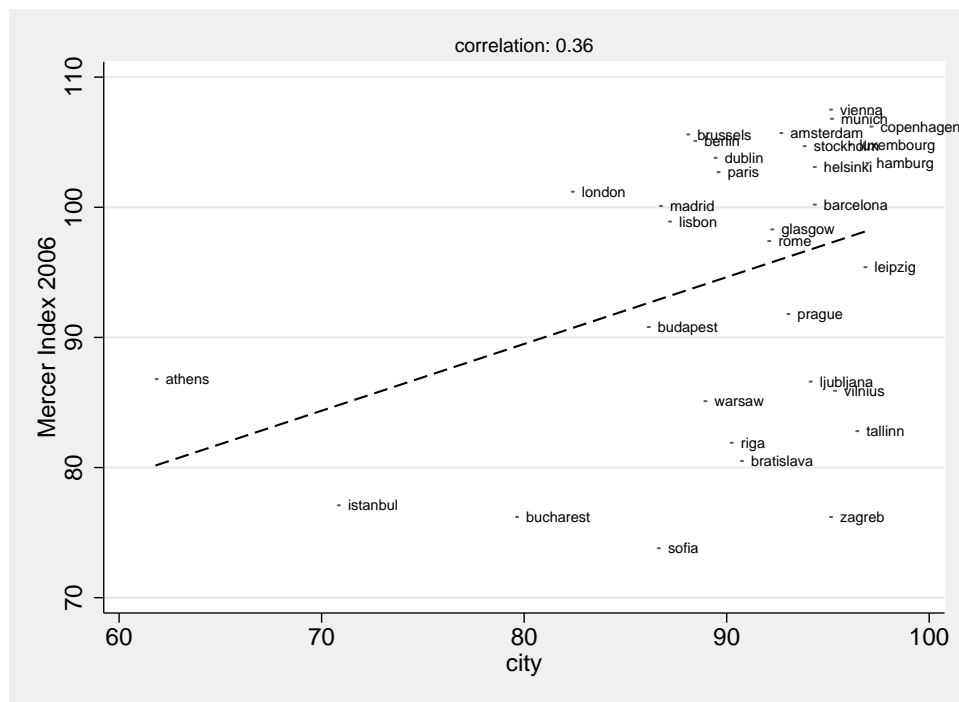

Figure 4: *Mercer index against city satisfaction. Linear fit shown.*

There is even less overlap between Mercer index and satisfaction with city if satisfaction is measured as a proportion of people who are very satisfied in figure 5. Correlation is only 0.14, and outliers from previous figure are present here as well. Two major European cities London and Paris are ranked among the top cities in Mercer ranking (>100), yet fewer than half of their residents agree to be satisfied with the city.
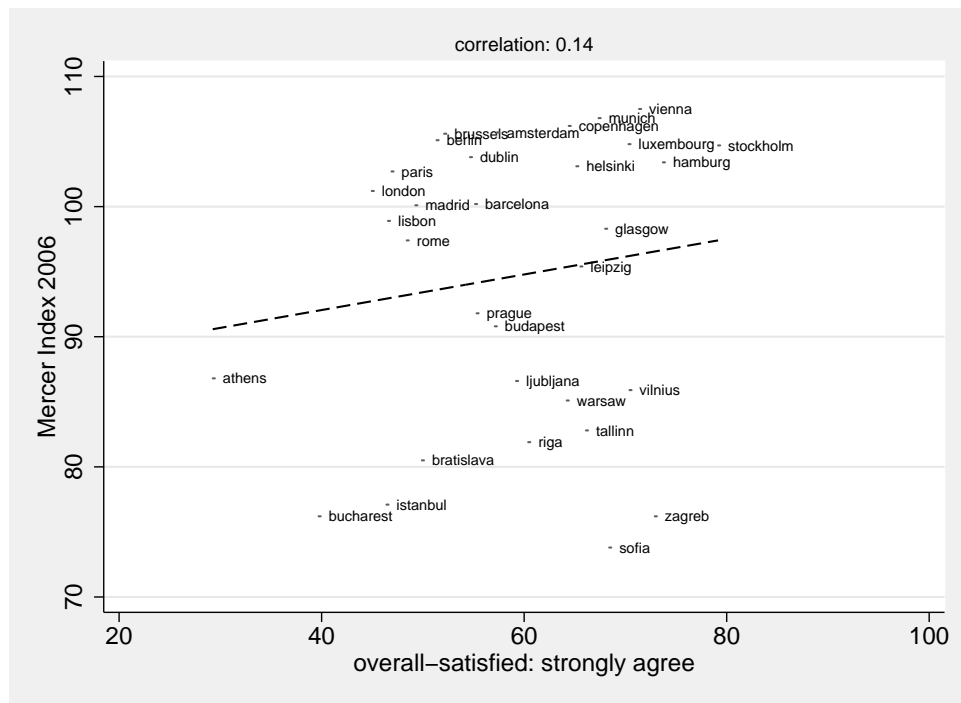
Figure 5: *Mercer index against proportion of "very satisfied". Linear fit shown.*

Let's revisit Florida (2008) hypothesis that openness, tolerance, self-expression and trust are related to livability/happiness. Florida (2008) suggested two measures of tolerance and openness: attitudes towards foreigners and gays. Openness and tolerance is measured here with answers to the questions whether people think that the presence of foreigners is good for the city (there was no question about gays). I do not have a good measure for self-expression, either. Trust can be measured directly, however. Figures 6 and 7 show correlation between Mercer index, satisfaction and "foreigners are good for the city" variable . As expected, "foreigners are good for the city" variable correlates only with satisfaction indicating that openness and tolerance is not captured by livability measure.
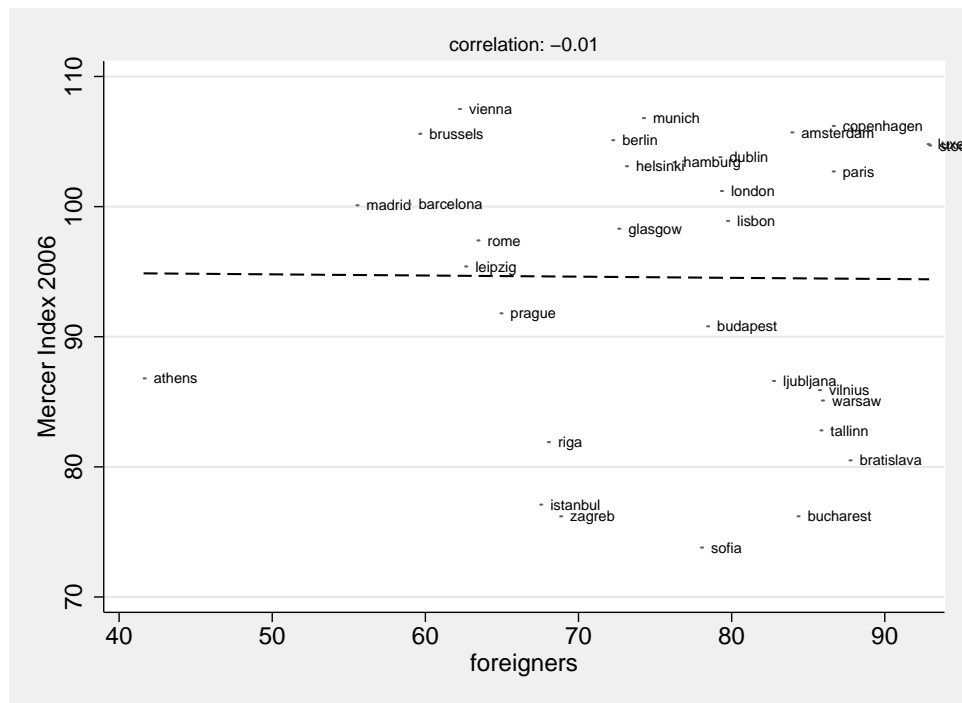
Figure 6: *Mercer index against "foreigners are good". Linear fit shown.*
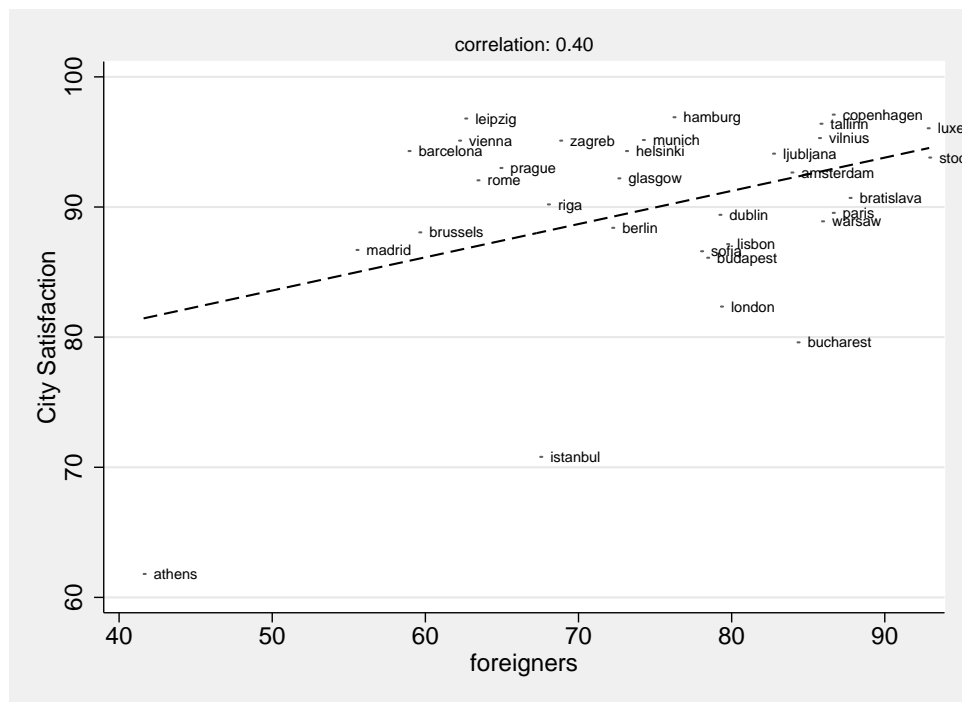

Figure 7: *city satisfaction against "foreigners are good". Linear fit shown.*

Figures 8 and 9 repeat the exercise, but this time for trust variable. As expected, trust is very highly related to both indices.
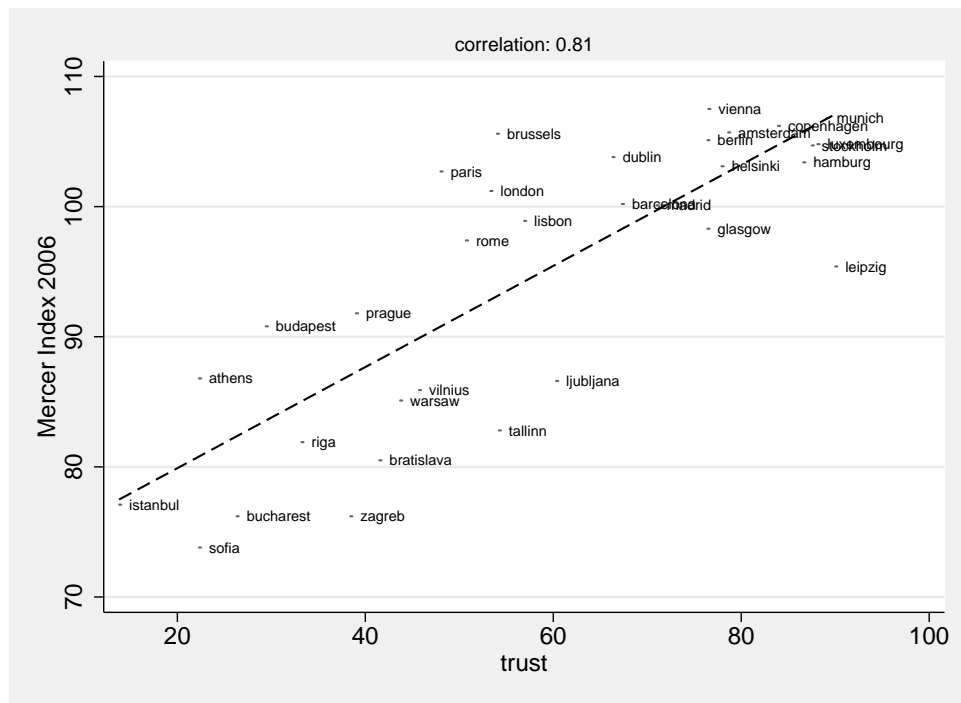
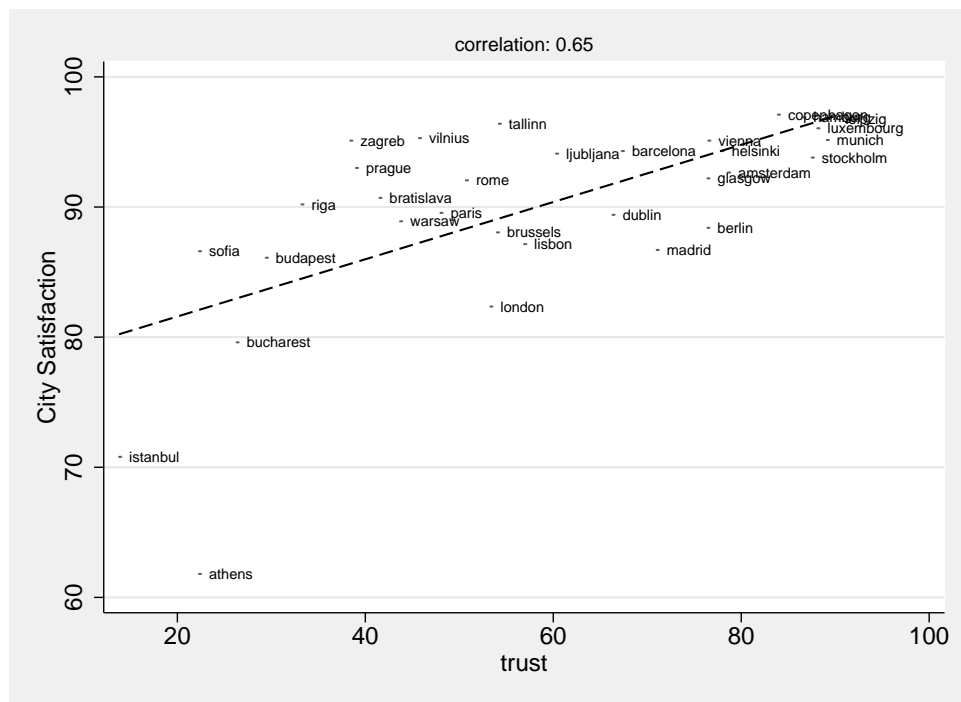**Figure 8:** *Trust against Mercer index. Linear fit shown.*

Figure 9: *Trust against city satisfaction. Linear fit shown.*

Summarizing, the relationship between the popular Mercer city ranking of livability and survey data measuring perceptions is weak.[17] Livability captures objective quality of life such as infrastructure. Survey items capture subjective quality of life such as satisfaction

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[17]Again, i use survey means over 2004, 2006 and 2009, but results are similar if I just use 2006 – only correlations with Mercer index are slightly higher by .05 to 0.1 – it is expected because Mercer index comes covers 2006.

with city. Trust is highly correlated with both, objective livability (0.8) and subjective satisfaction with city (0.65). While subjective indicators of quality of life are getting more popular and successful at country-level, livability rankings are still the most popular at the city-level. I postulate to pay more attention to subjective indicators of quality of life in cities. After all, what matters is what we perceive, not what is out there. And as demonstrated above, there is a big difference between objective and subjective measures of quality of life.

For the future research it would be useful to talk about objective and subjective indicators of quality of life for specific social groups. Lists saying "the best places to live" are as useful as lists saying "the best food to eat". To be sure, there are some places better than others, but for the most part it depends on who you are and what you are looking for. A place may be livable and/or subjectively satisfying for certain groups and unlivable and/or depressing for other groups. For instance if I am young and single and rich I may want to live in New York City or London, but if I am middle-class, middle-age and with kids I would prefer Dallas or Leipzig.[18]

5   Appendix – Domain Satisfactions

In addition to survey items in the body of the paper, I use here several other indicators of satisfaction with a specific domain of city life. Items are defined in table 4.

variable	question
"Generally speaking, please tell me if you are very satisfied,rather satisfied,rather unsatisfied or not at all satisfied with each of the following services in[city name]:"	
transport	"Public transport in the city, for example the bus, tram or metro"
schools	"Schools"
hospitals	"Health care services offered by hospitals"
doctors	"Health care services offered by doctors"
green	"Green spaces such as public parks and gardens"
streets	"The beauty of streets and buildings in one's neighborhood"
outdoor	"The outdoor recreation (e.g. walking or cycling)"
sport	"Sports facilities such as sport fields and indoor sport halls"
"For each of the following statements, please tell me, if this always, sometimes, rarely or never happens to you?"	
safe	"You feel safe in [city name]"

Table 4: Additional survey questions in UAPS.

Figure 10 scatters Mercer index against satisfaction with public transport. The relationship is stronger, as expected, because Mercer index measures infrastructure and material goods.

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[18]Florida (2008) produced some rankings for American cities for singles, professionals, families with children, empty-nesters, and retirees.
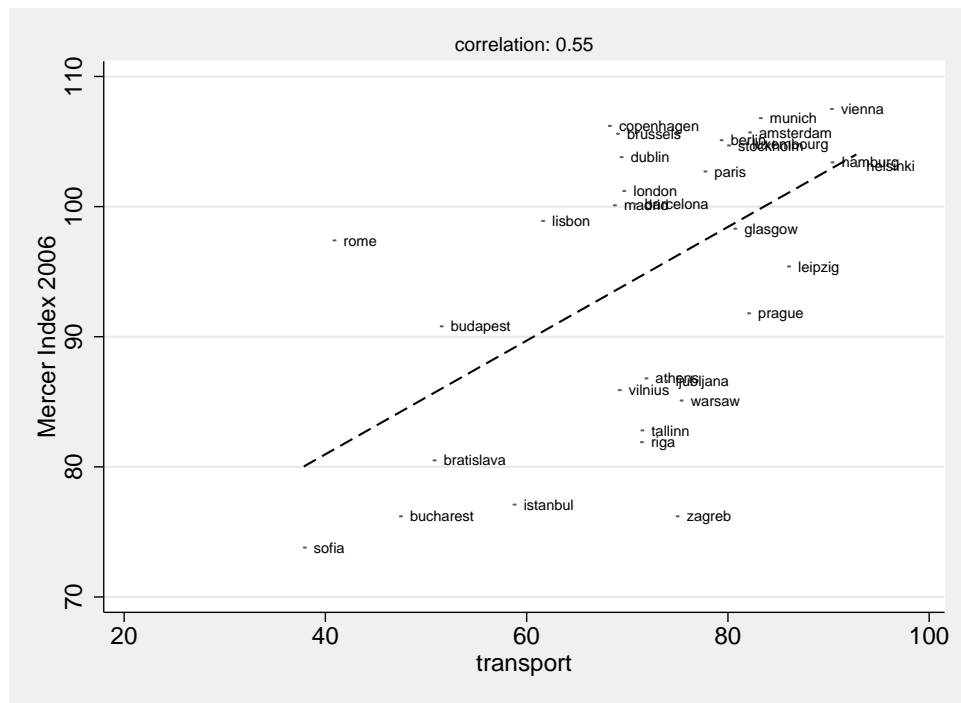
Figure 10: *Mercer index against satisfaction with public transportation. Linear fit shown.*

Interestingly, there is not much relationship between the Mercer Index and satisfaction with schools in figure 11. This is the lowest correlation between Mercer Index and satisfactions.
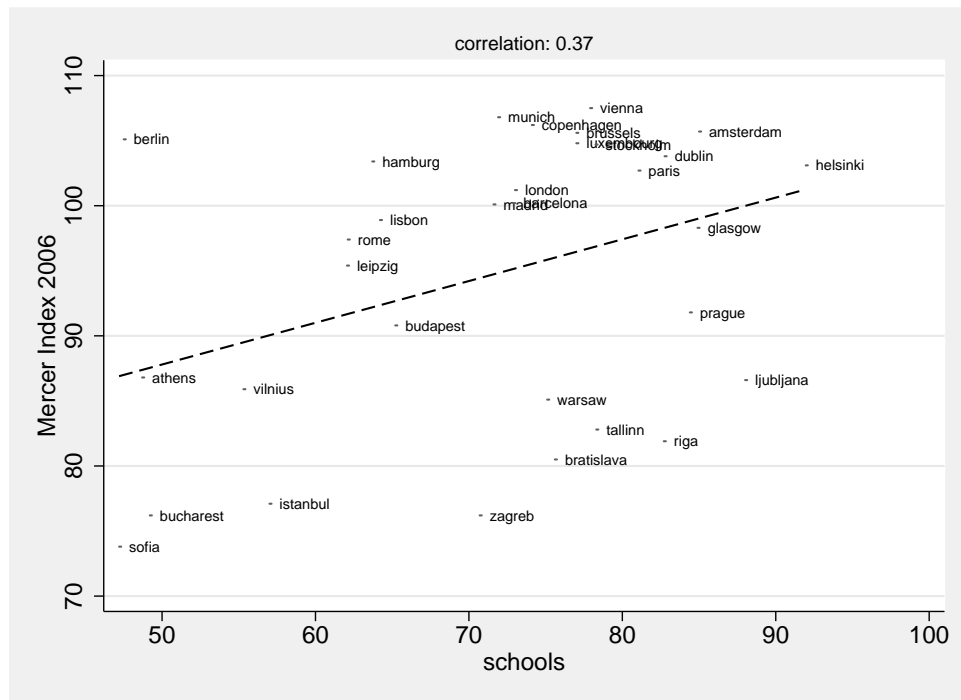

Figure 11: *Mercer index against satisfaction with schools. Linear fit shown.*

On the other hand, there is twice this much correlation with doctors.[19]. People in Western Europe tend to be more satisfied with

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[19]Urban Audit also asked about satisfaction with hospitals and results were similar– correlation of 0.73

doctors than people in Eastern Europe.
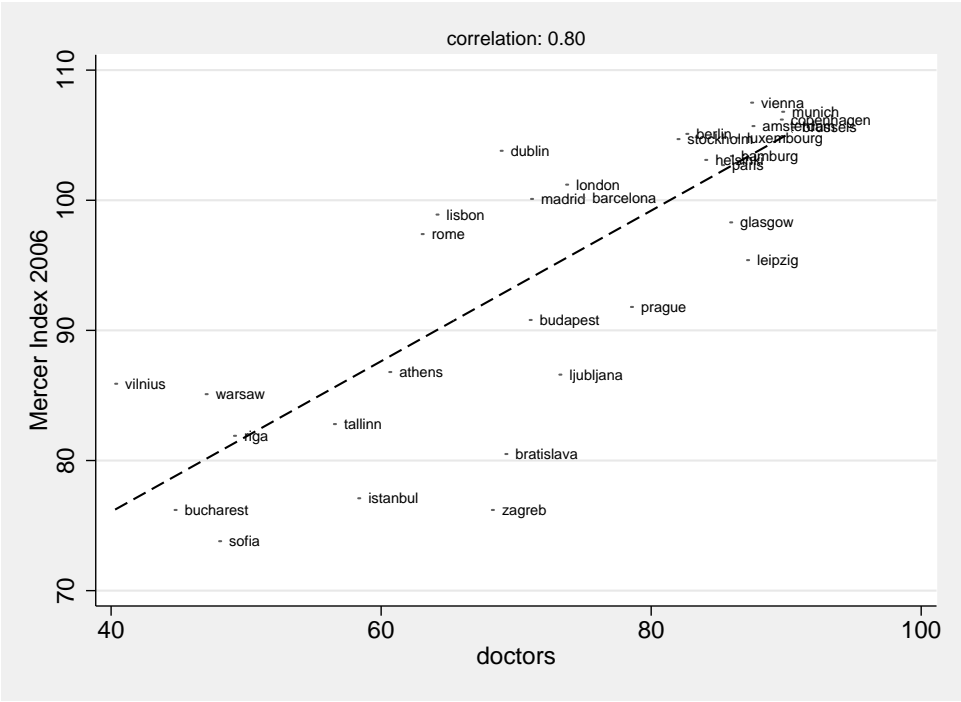
Figure 12: *Mercer index against satisfaction with doctors. Linear fit shown.*

Also satisfaction with sport facilities correlates highly with Mercer index in figure 13

Figure 13: *Mercer index against satisfaction with sport facilities. Linear fit shown.*

There are many more indicators like satisfaction with culture, cinemas, green spaces, beauty of streets, public spaces, outdoor recreation, and so forth. It is not practicable to graph them all, instead a corelation matrix is shown below.

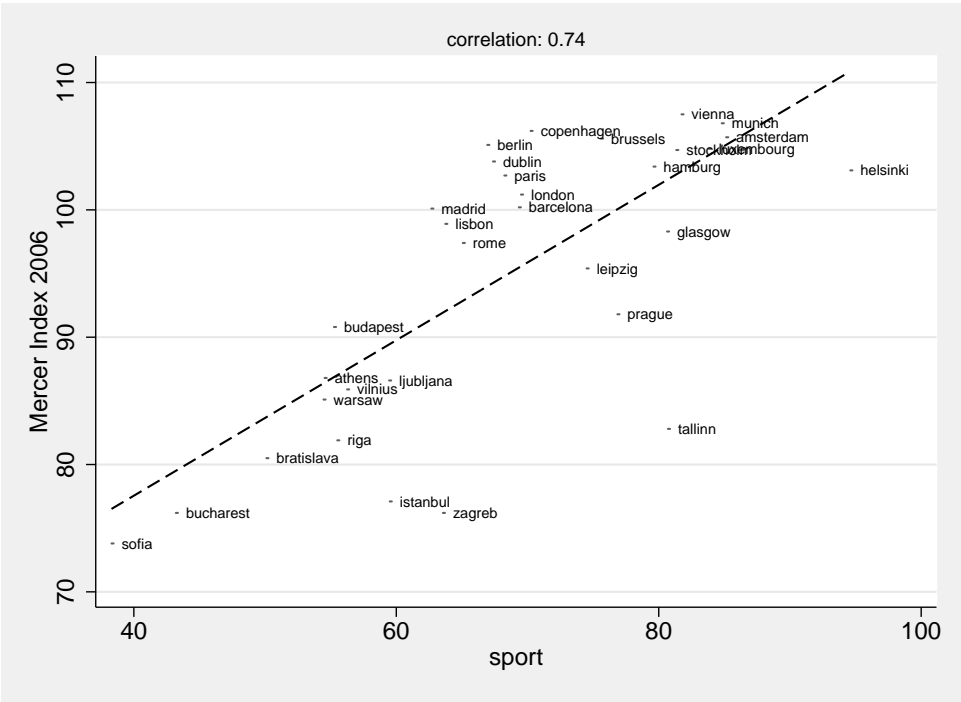**Table 5:** Cross-correlation table

Variables	city	transport	schools	hospitals	doctors	green	sport	streets	outdoor	safe	foreigners	trust	mercer06
city	1.0												
transport	0.4	1.0											
schools	0.5	0.5	1.0										
hospitals	0.5	0.7	0.4	1.0									
doctors	0.4	0.6	0.4	0.9	1.0								
green	0.6	0.7	0.6	0.7	0.6	1.0							
sport	0.5	0.8	0.6	0.8	0.8	0.7	1.0						
streets	0.6	0.8	0.6	0.8	0.7	0.8	0.8	1.0					
outdoor	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.8	1.0				
safe	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.8	0.7	1.0			
foreigners	0.4	-0.1	0.2	-0.0	-0.1	0.3	0.0	0.3	0.3	0.3	1.0		
trust	0.7	0.7	0.4	0.8	0.7	0.7	0.8	0.8	0.7	0.9	0.2	1.0	
mercer06	0.4	0.6	0.4	0.7	0.8	0.6	0.7	0.7	0.6	0.7	-0.0	0.8	1.0

City satisfaction best correlates with the following variables: trust, safe, outdoor, green, and streets. Trust, as discussed, is important for satisfaction. Safety, as expected, is important as well. And they both also correlate highly with Mercer index. The following variables, green, streets and outdoor also correlate highly with Mercer index. An interesting pattern emerges with respect to the foreigners variable – it is the only variable that does not correlate at all (zero rounding to one digit) with some other variables, and among them Mercer index, and at the same time it correlates most highly with overall satisfaction.

6 Appendix – Mercer full list of components

Political and Social Environment
Relationship with other Countries
Internal Stability
Crime
Law Enforcement
Ease of Entry and Exit
Economic Environment
Currency Exchange Regulations
Banking Services
Socio-Cultural Environment
Limitation on Personal Freedom
Media and Censorship
Medical and Health Considerations
Hospital Services
Medical Supplies
Infectious Diseases
Water Potability
Sewage
Waste removal
Air Pollution
Troublesome and Destructive Animals and Insects
Schools and Education
Schools
Natural Environment
Climate
Record of Natural
Disasters
Public Services and Transport
Electricity
Water Availability
Telephone
Mail
Public Transport
Traffic Congestion
Airport
Recreation
Variety of Restaurants
Theatrical and Musical
Performances
Cinemas
Sport and Leisure Activities
Consumer Goods
Meat and Fish
Fruits and Vegetables
Daily Consumption Items
Alcoholic Beverages
Automobiles
Housing
Housing
Household Appliances and Furniture
Household Maintenance and Repair

Table 6: Mercer full list of components

The above list comes from http://www.mercer.com/referencecontent.htm?idContent=1380465

7 Appendix – Google Maps

It helps to map data – this section presents some google maps of the variables discussed earlier. It turns out that there are large differences within countries as indicated by Okulicz-Kozaryn (2010), but differences by cities are even larger than by provinces. For instance, in developing Poland, Krakow and Gdansk are both happy, while Warsaw is unhappy and so is unhappy Berlin in Germany, while Leipzig and Hamburg are happy. Map is here (preferably use google chrome web browser): `http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=http://people.hmdc.harvard.edu/~akozaryn/keep1_sat.kml`. Another interesting pattern is that in the major European cities such as London, Paris, Rome, and Berlin there are quite a few people who are very satisfied with the city but also quite a lot who are quite satisfied.

In a second map `http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=http://people.hmdc.harvard.edu/~akozaryn/keep2_mer_trust_for.kml`, trust is much lower in Eastern and Central Europe than in Western and Northern Europe. Trust is also low in Italy and in London, and Paris, but not in Berlin. Foreigners are welcomed in Eastern Europe, France, London, but not in Italy, Austria, and Germany, except Hamburg. Interestingly, people in Brussels are not happy about foreigners, but people in Amsterdam are happy.

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