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Quality of life in cities – Empirical evidence in comparative European perspective



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ABSTRACT

This study investigated aspects of urban quality of life in European cities. To this end, the Flash Eurobarometer 366: Quality of life in European cities was used. The survey provides opinions of 41 thousands inhabitants from 79 European cities, which enables analysis of interrelation between citizen characteristics, neighbourhood and city contexts and satisfaction with life in a city. The study analysed the following dimensions potentially related to satisfaction with life in a city: (1) availability of services, environment and social aspects in cities and neighbourhood; (2) socio-demographic factors; and (3) city characteristics such as economic development, labour market pressures, size, location, quality of institutions and safety. Findings indicated that satisfaction with life in a city varied considerably both inside cities and across Europe. Dissatisfaction with public transport, cultural facilities, availability of retail outlets, green space, air quality, trustworthiness of people, public administration and administrative efficiency, contributed significantly to dissatisfaction with life in a city. However, when citizens felt secure and satisfied with their place of living, they were also more likely to be satisfied with life in a city. Finally, cities with high percentage of people satisfied with safety in a city tended to be those in which citizens were also more satisfied with life in a city.

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1. Introduction

Current focus of urban, social and even economic policy is on cities. Cities, seeking to attract capital and investors to develop large-scale urban projects, are believed to be becoming not only entrepreneurs, (Hartley, Potts, MacDonald, Erkunt, & Kufleitner, 2012; Vivant, 2013) but also smart living places, attracting creative individuals to become new citizens (Florida, 2005; Institute for Urban Strategies, 2014; Zenker, Eggers, & Farsky, 2013). Due to the constant emphasis on growth, the aim is not only to attract new but also to encourage existing residents to stay. This requires action to ensure citizens' adequate satisfaction with city life. One mean to achieve this end is proper urban planning, meeting citizens' needs and desires and ensuring quality of community (Smith, Nelischer, & Perkins, 1997).

Urban and community quality of life has become central to policy in most European Union (EU) countries, as reflected by numerous European and governmental papers on policy, as well as scientific publications presenting conceptual visions towards developing conditions for life in cities (Banai & Rapino, 2009; Insch & Florek, 2008; Sirgy & Cornwell, 2002; Smith et al., 1997; van Kamp, Leidelmeijer, Marsman, & de Hollander, 2003). These visions are mainly theoretical, seldom supported by empirical analysis due to the obvious limitations to a

visionary, forward-looking landscape or urban planning perspective (van Kamp et al., 2003). Therefore, this article was written to heed the call of scholars for more evidence on various aspects of city life and city features contributing to urban quality of life (Ballas & Dorling, 2013; Insch, 2010; Insch & Florek, 2008, 2010; Zenker & Rütter, 2014). This article makes distinctions between city, neighbourhood and citizen specific factors. A comparative European perspective is adopted to limit case-specificity of results. The following research questions were posed:

- Q1. Does general perception of a city contribute to urban quality of life reported by citizens?
- Q2. Do city specific features related to availability of services, environment, social factors and institutions contribute to urban quality of life reported by citizens?
- Q3. Is citizens' focus neighbourhood oriented or general in their assessment of urban quality of life?

Evidence to address these questions was from the Flash Eurobarometer 366: Quality of life in European cities (European Union, 2013). This represented the opinion of about 41 thousands citizens from 79 European cities about a city, neighbourhood as well as the personal situation of citizens. This type of data allow us to accommodate the hierarchical nature of city life, which simultaneously applies to individuals (living in households), households (residing in

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communities), neighbourhoods and communities (nested in cities) and cities (nested in regions, countries, etc.) (Ballas & Tranmer, 2012; Marans, 2015). Consequently, influence of both individual and household level characteristics, and also neighbourhood and city contexts were investigated together.

The paragraphs below describe the concept of urban quality of life. Next follows a description of methods with emphasis on data sources, choice of variables and model specification. The findings presented form the base for discussion and conclusions covering limitations of the study.

2. Urban quality of life

Of the various geographically defined spaces, this study concentrated on cities. To identify factors associated with the quality of life in a city, literature was reviewed covering studies on urban design, urban quality of life and neighbourhood/place/residential/city satisfaction and preference. The focus was on both satisfaction with the place and urban quality of life, since both these measures have been established as positively associated with satisfaction and quality of life (Ge & Hokao, 2006; Marans, 2015) and found to attract people to live in certain places (Kahrik, Temelova, Kadarik, & Kubes, 2015). Additionally, community quality has been accepted as a precondition for typical economic and cultural activities and contribution to quality of life in general (Ge & Hokao, 2006). Furthermore, it has been shown that place or residential satisfaction are prerequisites for commitment to a place (Zenker, Petersen, & Aholt, 2013), place or city attachment (Florek, 2011; Insch & Florek, 2008), place identity (Hernández, Carmen Hidalgo, Salazar-Laplace, & Hess, 2007) or city loyalty (Florek, 2011). Such affective bonds not only reduce intention to leave a place (Zenker & Rütter, 2014) but also encourage investment in neighbourhood relations and community life (Jacobs & Appleyard, 1987; Kahrik et al., 2015). A comprehensive review of theoretical approaches to research on life satisfaction or quality of life and associations with place and, in particular, city life can be found in Ge and Hokao (2006); Insch and Florek (2008) and Smith et al. (1997), while a comprehensive review of empirical studies addressing the association between place, space and well-being can be found in Ballas and Tranmer (2012).

Cities are often regarded as bundles of services provided to citizens (Gory, Ward, & Sherman, 1985; Insch & Florek, 2010). The needs and wants of citizens correspond to both social and economic city operation. The former focuses on cooperation and interaction between citizens and their satisfaction (Zenker & Rütter, 2014). The latter emphasises the industrial and functional dimensions of economic specialisation (Brunelle, 2013), which, from the citizen's perspective, implies the availability of work (Verstock, 1996). These needs are reflected by vision in city planning and urban design manifestos, designed to improve people's life quality. Following major theoretical approaches to urban design and planning, quality of urban community and urban quality of life, there are several distinct aspects arising at multiple scales (e.g., regional, metropolitan, sub-metropolitan, neighbourhood) that should be addressed by urban planners to render a city liveable (Ballas & Dorling, 2013; Banai & Rapino, 2009; Clifton, Ewing, Knaap, & Song, 2008; Jacobs & Appleyard, 1987; Lynch & Rodwin, 1958; Smith et al., 1997). These are:

1. Physical features such as size and location of urban block, buildings, streets, pedestrian ways, open space vegetation and featured areas (Clifton et al., 2008; Smith et al., 1997);
2. Accessibility understood as convenient access to retail shops, parking spaces, schools, sport facilities, cultural facilities and labour market (Banai & Rapino, 2009; Clifton et al., 2008; Smith et al., 1997);
3. Liveability perceived in terms of survival, i.e., related to access to healthcare, personal health and health of the environment and to safety understood as lack of danger and sense of assurance (Smith et al., 1997);

4. Communication comprising telecommunication technologies and transportation (Banai & Rapino, 2009);
5. Character reflected by sense of place and time, stability, warmth and aesthetics (Smith et al., 1997);
6. Personal freedom comprising freedom of expression, privacy and affordability but also allowing control (Smith et al., 1997).

These belong to physical, social, environmental and economic features of a city (Sirgy & Cornwell, 2002) and their presence should contribute to better urban quality of life. Examples of city features/facilities associated with urban quality of life used in research are presented in Table 1.

In this study the physical, social, environmental and economic features of a city were complemented by institutional factors reflecting quality and efficiency of local government. This choice is justified by numerous recent political and scientific debates (Holmberg et al., 2009), in addition to empirical studies that reveal quality of governmental services and the rule of law as important determinants for quality of life (Bérenger & Verdier-Chouchane, 2007; Hagerty et al., 2001), well-being (Charron et al., 2014) and happiness (Frey & Stutzer, 2000).

Table 1

City features associated with urban quality of life used in research.

| Type | Examples |
|-----------------------------|---|
| Physical features | Parks and gardens, historic buildings and museums (Insch & Florek, 2010; Türksever & Atalik, 2001; Zenker, Petersen, et al., 2013) Culture, the arts and creative scenes (Ge & Hokao, 2006; Insch & Florek, 2010; Zenker, Petersen, et al., 2013) Public transport efficiency and availability (Insch & Florek, 2010; McCrea, Stimson, & Western, 2005; Türksever & Atalik, 2001) Access to services such as education and health care provision (Baum, Arthurson, & Rickson, 2010; McCrea et al., 2005; Türksever & Atalik, 2001; Zenker, Petersen, et al., 2013) Sports grounds and facilities (Insch & Florek, 2010; Türksever & Atalik, 2001) Shopping facilities (Banai & Rapino, 2009; Clifton et al., 2008; Lynch & Rodwin, 1958; Zenker & Rütter, 2014) Density of population (Lee & Guest, 1983; Parkes, Kearns, & Atkinson, 2002) Public spaces such as squares, streets and pedestrian areas (Jacobs & Appleyard, 1987; Lynch & Rodwin, 1958; Smith et al., 1997) |
| Features of a social nature | Openness and tolerance (Zenker, Petersen, et al., 2013) Perception of neighbourhood problems (Baum et al., 2010) Neighbourhood interactions (Baum et al., 2010; Kahrik et al., 2015; McCrea et al., 2005) Existence of private and social networks (e.g. family and friends) (Dimitris Ballas & Dorling, 2013; Parkes et al., 2002; Zenker & Rütter, 2014) Personal and public safety (Clifton et al., 2008; Insch & Florek, 2010; Parkes et al., 2002; Smith et al., 1997) |
| Environmental features | Natural environment (Ge & Hokao, 2006; Insch & Florek, 2010; Türksever & Atalik, 2001) Panorama and landscape (Insch & Florek, 2010) Low pollution (Türksever & Atalik, 2001; Zenker, Petersen, et al., 2013) Tranquillity/noise (Baum et al., 2010; Türksever & Atalik, 2001; Zenker, Petersen, et al., 2013) Cleanliness (Zenker, Petersen, et al., 2013) |
| Economic features | Housing market and housing conditions (Sirgy & Cornwell, 2002; Türksever & Atalik, 2001; Zenker, Petersen, et al., 2013) Labour market opportunities (Zenker, Petersen, et al., 2013) Cost of living (McCrea et al., 2005; Türksever & Atalik, 2001; Zenker, Petersen, et al., 2013) Local taxes (Türksever & Atalik, 2001) |
| Institutional features | Quality of governmental services and the rule of law (Charron, Dijkstra, & Lapuente, 2014; Frey & Stutzer, 2000; Holmberg, Rothstein, & Nasiritousi, 2009) |

Table 2
Individual characteristics associated with urban quality of life used in research.

| Characteristic | Examples of use |
|--------------------------------------|---|
| Duration of residence | (Baum et al., 2010; Florek, 2011; Hernández et al., 2007; Insch & Florek, 2010; Parkes et al., 2002; Zenker & Rütter, 2014) |
| Place of birth | (Insch & Florek, 2010; Zenker & Rütter, 2014) |
| Level of household disposable income | (Baum et al., 2010; Parkes et al., 2002; Theodori, 2004) |
| Life-cycle stage | (Baum et al., 2010) |
| Status on the labour market | (Parkes et al., 2002) |
| Age | (Gory et al., 1985; Insch & Florek, 2010; Theodori, 2004) |
| Level of education | (Lee & Guest, 1983; Theodori, 2004) |
| Extent of social interactions | (Costanza et al., 2007; Morales, Edwards, Flores, Barr, & Patrick, 2011; Stiggelbout, de Vogel-Voogt, Noordijk, & Vliet Vlieland, 2008) |

Here, an attempt was made to verify whether these factors were also important at the city level.

Many scholars further emphasise that some individual characteristics of citizens are associated with satisfaction, implying that they influence how urban quality of life may vary (Baum et al., 2010; Hernández et al., 2007; McCrea et al., 2005; Parkes et al., 2002). Examples of such characteristics are summarised in Table 2.

3. Material and methods

3.1. Data source

Data used was from the Flash Eurobarometer 366: Quality of life in the European cities (European Union, 2013),¹ a survey was carried out towards the end of 2012 in 27 European Union countries, Croatia, Iceland, Norway, Switzerland and Turkey. From each city 500 citizens were interviewed. The sample covered capital cities, except in Switzerland, and an additional one to six other cities from each country depending on its size. Surrounding areas of Athens, Lisbon, Manchester and Paris were also studied. This analysis, therefore, reflects a total of 83 entities and around 41 thousand respondents from different social and demographic groups. During the analysis, post-stratification weight available directly from the data set was applied. City level data from the Urban Audit and from the Regional Statistics databases of Eurostat were used to augment information about cities and to supplement subjective with objective information.

3.2. Dependent variable: Satisfaction with life in a city

There is common conceptual agreement and practice that satisfaction is an important outcome in quality of life research (Marans, 2015, p. 50). In this study a question item directly addressing satisfaction with life in a city was used as an indicator for urban quality of life. Consequently, the terms 'satisfaction with life in a city' or 'citizen satisfaction' are used henceforth as counterparts of urban quality of life.

Respondents indicated their agreement with the statement 'I am satisfied with life in [city name]' using the four-point scale 'strongly agree', 'somewhat agree', 'somewhat disagree' and 'strongly disagree'. As this scale is categorical, it was dichotomised for further analyses to reflect either positive or negative opinions. Percentage of respondents who 'strongly agreed' or 'somewhat agreed' with the statement are presented in Fig. 1 and the distribution of answers in the data pool is presented in the note below the figure.

¹ European Commission, Brussels (2013): Flash Eurobarometer 366 (Quality of Life in European Cities). TNS Political&Social [producer]. GESIS Data Archive, Cologne. ZA5885 Data file Version 1.0.1, doi:10.4232/1.11926.

Although it is clear that most respondents acknowledged their satisfaction with life in the city, about 10% of citizens seemed dissatisfied. Further, when investigated from the city perspective, the picture was not so conclusive. Although >95% of those living in Copenhagen, Groningen, Oslo, Zurich, Hamburg and Aalborg were satisfied with life in a city, satisfaction was considerably lower in Athens (52% satisfied), Athens surrounding area (59%) and Naples (65%).

3.3. Independent variables

Citizen satisfaction may be ascribed to two sources: individual feelings and perceptions, which would explain intra-group variation; and city specific characteristics explaining inter-group variation. Individual characteristics of citizens, instead, reflect their socio-economic features and contribute to intra-group variation. To separate these two sources of variation a two-level modelling framework was applied and variables describing both levels were selected (i.e., individual and city level).

3.4. Individual level

Individual level variables quantified (A) opinions about a city or a neighbourhood and (B) personal situation. Opinions reflected availability of services in a city (A1) and in a neighbourhood (A'1), environmental features of a city (A2), social aspects to life in a city (A3) and in a neighbourhood (A'3) and the quality of institutions in a city (A4). Analysis of economic factors at the individual level was not an option in this study due to data limitations. It was instead accommodated at the city level.

To assess perceived satisfaction with services that citizens consumed in the course of daily life, this study included a set of variables describing satisfaction with city facilities. Model variables quantified satisfaction with public transport (A1.1), health care (A1.2), cultural (A1.3), sport (A1.4) and shopping facilities (A1.5) in a city. Additionally, availability of public city spaces, such as squares and pedestrian areas (A1.6) was also accounted for.² Regarding environmental factors, satisfaction with availability of green space (A2.1), such as parks and gardens, quality of the air (A2.2), noise level (A2.3) and cleanliness in a city (A2.4) were analysed. Opinions about sense of security in the city (A3.1) and trustworthiness of city folk (A3.2) were investigated as social factors. Opinions about the efficiency of administrative services (A4.1) and trustworthiness of public administration (A4.2) reflected institutional factors.

With respect to the neighbourhood, opinion about sense of security in the neighbourhood (A'3.1) and trustworthiness of people in the neighbourhood (A'3.2) reflecting social factors and opinion about the state of the streets and buildings in the neighbourhood (A'1.1) were taken into account.

As regards variables reflecting a respondent's individual situation (B), focus was on gender, age, level of education, household composition (marital status identified), duration of residence with details of continuing residence in their place of birth, assessment of the financial situation and type of community. Additionally, satisfaction with place was used as a control variable for respondent life, next to citizens' personal characteristics, as mentioned. Table 3 gives details of wording and answer categories for all questions.

² It should be noted that, despite availability from the survey, variables describing satisfaction with schools and other educational facilities or opinion about availability of affordable good housing were rejected from the analysis owing to the high frequency of missing responses. In the pooled data, they accounted for 14 and 9% of the total, respectively, but for some cities approached 25%. Missing data regarding educational facilities and the housing market might reflect lack of relevance to those not relying on these services and therefore exercising no opinion on them.

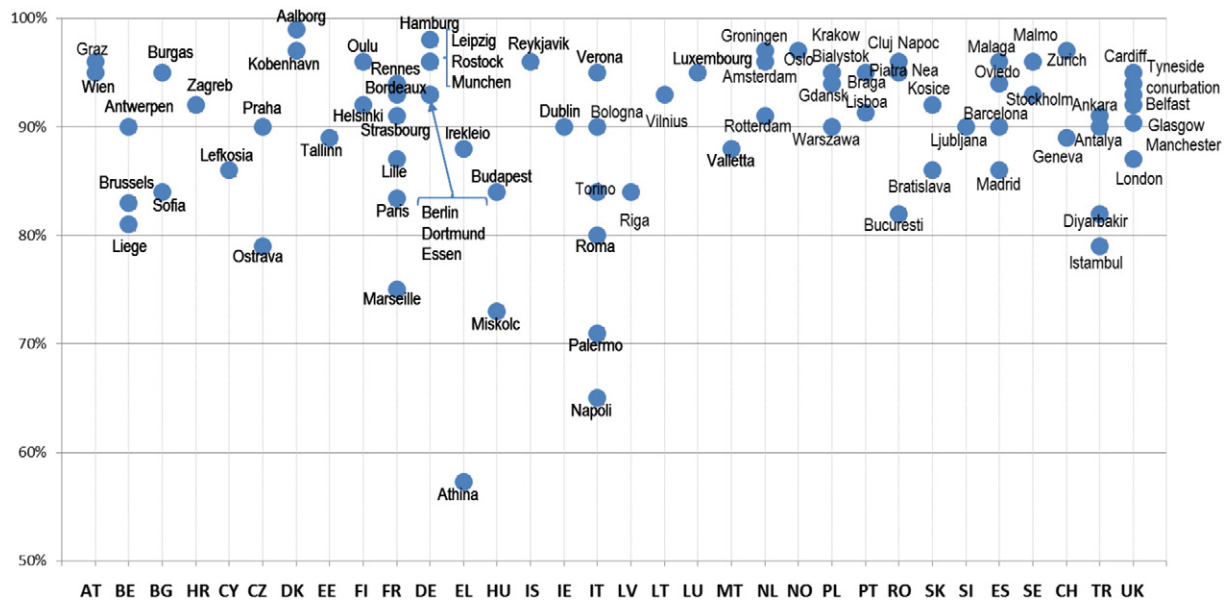


Fig. 1. Satisfaction with life in a city – percentage of persons who ‘strongly agree’ or ‘somewhat agree’ with the statement ‘I am satisfied with life in [city name]’ in European cities Note: the distribution of answers in the data pool is following: (Strongly agree 56.1%; Somewhat agree 33.1%; Somewhat disagree 6.3%; Strongly disagree 3.9%; Don’t know 0.6%) AT – Austria, BE – Belgium, BG – Bulgaria, HR – Croatia, CY – Cyprus, CZ – the Czech Republic, DK – Denmark, EE – Estonia, FI – Finland, FR – France, DE – Germany, EL – Greece, HU – Hungary, IS – Iceland, IE – Ireland, IT – Italy, LV – Latvia, LT – Lithuania, LU – Luxembourg, MT – Malta, NL – the Netherlands, NO – Norway, PL – Poland, PT – Portugal, RO – Romania, SK – Slovakia, SI – Slovenia, ES – Spain, SE – Sweden, CH – Switzerland, TR – Turkey, UK – the United Kingdom;

3.5. City level

In order to investigate beyond the individual level, city-specific variables (C) were included in the analysis. Association between unemployment rate and citizen satisfaction was examined to detect relationship between the situation on the local labour market and satisfaction with life in a city. Then, association between the gross domestic product (GDP) per capita in purchasing power standards and citizen satisfaction was examined to account for any relationship between mean affluence and satisfaction with life in a city. These objective variables allowed assessment of the economic aspects of life in a city, which, due to methodological issues, were missing at the individual level. Additionally, compositional variables related to perception of social and institutional features of a city were examined (expressed as percentages of citizens confirming the presence of the features). The aim was to add aggregated information reflecting global assessment of a city, to allow an account for variation between cities.

As cities analysed differed substantially with respect to size, in the analysis, population size was used to control for this effect. Then, following the reasoning of Knez (2005), who claimed that climate shapes how a place is experienced and remembered, a proxy for climate was introduced to the model in the form of a dichotomous control variable distinguishing Southern European from other European cities. Using this variable, the aim was to control for the fact that people from Southern Europe in general experienced more favourable climates, thus, following reasoning of Knez (2005), they were expected to be more satisfied with life in a city (see Table 3 for list of variables).

3.6. Model specification

The authors share the belief of Ballas (2013); Baum et al. (2010) and Van Kamp et al. (2003), that urban quality of life is not only a function of its citizen characteristics but also of the potential interactions with other ‘higher’-level factors. Therefore, focus was directed to simultaneous investigation of both the citizen, neighbourhood and city characteristics, as expressed by citizens and also existing specifics at the city level (e.g., situation on the labour market expressed by the unemployment

rate), concurrently influencing level of city satisfaction. As our dependent variable was dichotomous (after recoding) and independent variables were both at the citizen and city level, the appropriate models to examine any association were two-level logistic or probit regression (Hox, 2002; Snijders & Bosker, 1999).³ Neglect of this two-level structure would otherwise lead to underestimation of standard errors for the regression coefficient, especially at city level, which, in turn, would invalidate assessment of significance.

In the study, two-level logistic regression was applied and the estimation was performed according to the following strategy. First, the intercept-only (empty) model was estimated:

$$\pi_{ij} = \text{logistic}(\beta_{0j}) \quad (1)$$

where π_{ij} is the probability of outcome 1 for citizen ij and $1-\pi_{ij}$ is the probability of outcome 0 for citizen ij . Subscript ij denotes that a variable varies between both respondents and cities, whereas subscript j denotes that a variable varies between cities.

Eq. (1) was then extended with explanatory variables X_{ij} at the citizen level as follows:

$$\pi_{ij} = \text{logistic}(\beta_{0j} + \beta_{1j}X_{ij}). \quad (2)$$

Then, intercept β_{0j} from Eq. (2) was assumed to vary between cities and this variation was modelled by the city level variables Z_j in the

³ In our model there are also variables describing neighbourhood. They were collected as opinions of citizens (i.e., individuals). However, in the survey neither is the neighbourhood identifier available, nor is the survey representative at neighbourhood level, which precludes aggregating these variables at the neighbourhood level, as is done with variables directly describing a city. Consequently, it is not feasible to apply three-level model (i.e., with individuals nested in neighbourhoods, which are nested in cities).

Table 3
Independent variables: wording of questions, answer categories, range.

| Variable | Categories/range |
|---|--|
| Citizen level variables: Opinions about a city (A) | |
| <i>Facilities and services (A1)</i> | |
| Public transport, for example the bus, tram or metro | 0 very satisfied, 1 fairly satisfied, 2 not very satisfied, 3 not at all satisfied |
| Health care services, doctors and hospitals | |
| Cultural facilities (concert halls, theatres, museums and libraries) | |
| Sport facilities: sport fields and indoor sport halls | |
| Availability of retail shops | |
| Public spaces such as markets, squares and pedestrian areas | |
| <i>Environmental factors (A2)</i> | |
| Green spaces - such as parks and gardens | 0 very satisfied, 1 fairly satisfied, 2 not very satisfied, 3 not at all satisfied |
| Quality of the air | |
| Noise level | |
| Cleanliness | |
| <i>Social aspects (A3)</i> | |
| I feel safe in [city name] | 0 strongly agree, 1 somewhat agree, 2 somewhat disagree, 3 strongly disagree |
| Generally speaking, most people in my city can be trusted | |
| <i>Institutional factors (A4)</i> | |
| Administrative services of [city name] help people efficiently | 0 strongly agree, 1 somewhat agree, 2 somewhat disagree, 3 strongly disagree |
| Generally speaking, the public administration of [city name] can be trusted | |
| Citizen level variables: Opinions about a neighbourhood (A') | |
| <i>Facilities and services (A'1)</i> | |
| State of the streets and buildings in your neighbourhood | 0 very satisfied, 1 fairly satisfied, 2 not very satisfied, 3 not at all satisfied |
| <i>Social aspects (A'3)</i> | |
| I feel safe in my neighbourhood | 0 strongly agree, 1 somewhat agree, 2 somewhat disagree, 3 strongly disagree |
| Generally speaking, most people in my neighbourhood can be trusted | |
| Citizen level control variables: Personal characteristics of a citizen (B) | |
| Are you satisfied with a place where you live | 0 very satisfied, 1 fairly satisfied, 2 not very satisfied, 3 not at all satisfied |
| Are you satisfied with the financial situation of your household | |
| Household composition/marital status | 0 other, 1 single person household, 2 married or cohabiting couple, no children (living at home), 3 single parent, one or more children living at home, 4 married or cohabiting couple and children living at home |
| Years living in [city name] | 0 < 1 year, 1 whole life, 2 > 10 years, 3 between 5 and 10 years, 4 between 1 and 5 years |
| Difficulties paying bills in the last 12 months | 0 almost never or never, 1 from time to time, 2 most of the time |
| Age group | 0 '65+', 1 '15–24', 2 '25–34', 3 '35–44', 4 '45–54', 5 '55–64' |
| Gender | 0 male, 1 female |
| Type of community | 0 large town, 2 small or middle sized town, 3 rural area or village |
| City level variables (C) | |
| Percentages of citizens who strongly agree or somewhat agree with statements: | Continuous [0, 1] |
| Administrative services of [city name] help people efficiently; Generally speaking, the public administration of [city name] can be trusted; I feel safe in [city name]; Generally speaking, most people in my city can be trusted; | |
| Unemployment rate | Continuous [0, 1] |
| Gross domestic product per capita in purchasing power standards (GDP per capita in PPS) | Continuous [0, +∞) |
| City level control variable | |
| Population size | Continuous [0, +∞) |
| Location | 1 Southern Europe; 0 other |

second level regression equation:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}Z_j + u_{0j} \tag{3}$$

where u_{0j} described a random error term at city level.

Finally, substituting Eq. (3) into Eq. (2) we obtain the two-level random intercept logistic regression model:

$$\pi_{ij} = \text{logistic}(\gamma_{00} + \beta_{1j}X_{ij} + \gamma_{01}Z_j + u_{0j}). \tag{4}$$

From (4), the estimation of citizen level and city level effects was obtained. As both samples (citizens and cities) were substantial, both types of effects could be estimated reliably (Bryan & Jenkins, 2013).

In order to assess inter-city heterogeneity in levels of urban quality of life operationalised through citizen satisfaction and thus, to numerically justify two-level modelling, the conditional intra-class correlation coefficient or residual intra-class correlation coefficient (ICC) (Rabe-Hesketh & Skrondal, 2008) was computed according to the following formula:

$$ICC = \frac{\text{var}(u_{0j})}{\text{var}(u_{0j}) + \frac{\pi^2}{3}} \tag{5}$$

where $\frac{\pi^2}{3}$ is citizen level residual variance resulting from the logistic distribution (Snijders & Bosker, 1999).

All computations were conducted in IBM SPSS Statistics 20.0.0 and Mplus 7.3.

4. Results

The analysis was initiated using missing data imputation. Missing values were imputed for a set of questions by multiple imputation using Bayesian estimation (Muthén & Muthén, 2012; Rubin, 1987; Schafer, 1997). To impute missing values, all questions, as well as, respondent gender, age, level of education, household composition, length of residence, occupation, assessment of the financial situation and type of the community were used. Ten datasets were generated for analysis. Estimates were averaged over the set of analyses and standard errors computed from the means of the standard errors and the inter-analysis parametric estimate variation (Schafer, 1997).

Then, in order to assess how satisfaction varied not only among citizens but also between cities, the intra-class correlation coefficient based on the intercept-only model was calculated. As city level variance was significant and amounted to 0.646, the ICC, was computed as 0.164 using Eq. (5), confirming significant clustering within cities. To investigate how well citizen, neighbourhood and city level characteristics predicted satisfaction, first, the model was estimated only including citizen level variables (model 1 in Table 4). Then, this model was complemented by the city level variables (models 2–5 in Table 4) to examine whether the city characteristics expanded understanding of variability in city satisfaction. More specifically, city level variables explained city-specific variation in mean level of probability of satisfaction (with living in a city), operationalised as γ_{00} in Eq. (4). The estimates from each model are presented as an odds-ratio.

Introducing individual level variables (model 1) considerably reduced the ICC, from 0.164 to 0.046. From this, it was inferred that the set of variables describing citizens explained variation in levels of satisfaction. In particular, this study primarily demonstrated that citizen satisfaction was asymmetrical. When citizens were not satisfied with public transport, cultural facilities, green spaces, availability of retail outlets, air quality, efficiency of public administration and trustworthiness of public administration, they were also, in general, less satisfied with life in a city. However, no support was found for the claim that if citizen satisfaction with these aspects of life increased beyond the “fairly

Table 4Odds ratios from two-level logistic regression models of satisfaction with life in a city ($N_{\text{citizens}} = 41,645$, $N_{\text{cities}} = 83$).

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|----------|----------|----------|----------|----------|
| <i>Citizen level variables: Opinions about a city</i> | | | | | |
| <i>Facilities and services</i> | | | | | |
| Public transport (ref. = fairly satisfied) | | | | | |
| Very satisfied | 1.06 | 1.062 | 1.061 | 1.062 | 1.061 |
| Not very satisfied | 0.813*** | 0.811*** | 0.812*** | 0.812*** | 0.812*** |
| Not at all satisfied | 0.7*** | 0.698*** | 0.701*** | 0.701*** | 0.698*** |
| Health care services (ref. = very satisfied) | | | | | |
| Very satisfied | 1.025 | 1.027 | 1.026 | 1.026 | 1.025 |
| Not very satisfied | 0.958 | 0.955 | 0.956 | 0.956 | 0.955 |
| Not at all satisfied | 0.924 | 0.92 | 0.921 | 0.92 | 0.922 |
| Sport facilities (ref. = fairly satisfied) | | | | | |
| Very satisfied | 1.014 | 1.013 | 1.013 | 1.013 | 1.013 |
| Not very satisfied | 0.944 | 0.943 | 0.945 | 0.945 | 0.945 |
| Not at all satisfied | 0.931 | 0.931 | 0.932 | 0.932 | 0.934 |
| Cultural facilities (ref. = fairly satisfied) | | | | | |
| Very satisfied | 1.084 | 1.088 | 1.087 | 1.087 | 1.082 |
| Not very satisfied | 0.864* | 0.861* | 0.862* | 0.862* | 0.862* |
| Not at all satisfied | 0.792* | 0.789* | 0.788* | 0.789* | 0.787** |
| Public spaces (ref. = fairly satisfied) | | | | | |
| Very satisfied | 0.999 | 0.997 | 0.998 | 0.998 | 0.999 |
| Not very satisfied | 0.855** | 0.854*** | 0.853*** | 0.853*** | 0.854*** |
| Not at all satisfied | 0.908 | 0.905 | 0.903 | 0.904 | 0.905 |
| Availability of retail shops (ref. = fairly satisfied) | | | | | |
| Very satisfied | 1.034 | 1.035 | 1.035 | 1.034 | 1.035 |
| Not very satisfied | 0.873* | 0.874* | 0.873* | 0.874* | 0.871* |
| Not at all satisfied | 0.777** | 0.778** | 0.777** | 0.777** | 0.773** |
| <i>Environmental factors</i> | | | | | |
| Green spaces (ref. = fairly satisfied) | | | | | |
| Very satisfied | 1.044 | 1.045 | 1.045 | 1.045 | 1.044 |
| Not very satisfied | 0.765*** | 0.763*** | 0.764*** | 0.764*** | 0.766*** |
| Not at all satisfied | 0.784*** | 0.781*** | 0.782*** | 0.782*** | 0.785*** |
| Quality of the air (ref. = fairly satisfied) | | | | | |
| Very satisfied | 1.154 | 1.153 | 1.155 | 1.153 | 1.148 |
| Not very satisfied | 0.792*** | 0.791*** | 0.79*** | 0.791*** | 0.795*** |
| Not at all satisfied | 0.649*** | 0.647*** | 0.646*** | 0.646*** | 0.652*** |
| Noise level (ref. = fairly satisfied) | | | | | |
| Very satisfied | 0.874 | 0.873 | 0.871 | 0.871 | 0.872 |
| Not very satisfied | 0.974 | 0.973 | 0.972 | 0.972 | 0.972 |
| Not at all satisfied | 0.79*** | 0.788*** | 0.788*** | 0.787*** | 0.787*** |
| Cleanliness (ref. = fairly satisfied) | | | | | |
| Very satisfied | 0.919 | 0.918 | 0.918 | 0.918 | 0.911 |
| Not very satisfied | 1.01 | 1.01 | 1.012 | 1.013 | 1.021 |
| Not at all satisfied | 0.867* | 0.867* | 0.868* | 0.869* | 0.879* |
| <i>Social factors</i> | | | | | |
| I feel safe in [city name] (ref. = somewhat agree) | | | | | |
| Strongly agree | 1.293** | 1.29** | 1.289** | 1.289** | 1.274** |
| Somewhat disagree | 0.537*** | 0.537*** | 0.538*** | 0.537*** | 0.543*** |
| Strongly disagree | 0.353*** | 0.352*** | 0.353*** | 0.353*** | 0.358*** |
| Generally speaking, most people in my city can be trusted (ref. = somewhat agree) | | | | | |
| strongly agree | 1.195 | 1.192 | 1.191 | 1.191 | 1.194 |
| somewhat disagree | 0.784*** | 0.784*** | 0.785*** | 0.785*** | 0.782*** |
| strongly disagree | 0.638*** | 0.638*** | 0.638*** | 0.638*** | 0.633*** |
| <i>Institutional factors</i> | | | | | |
| Administrative services of [city name] help people efficiently (ref. = somewhat agree) | | | | | |
| Strongly agree | 1.093 | 1.093 | 1.092 | 1.092 | 1.092 |
| Somewhat disagree | 0.827*** | 0.828*** | 0.829*** | 0.829*** | 0.827*** |
| Strongly disagree | 0.73*** | 0.731*** | 0.731*** | 0.731*** | 0.728*** |
| Generally speaking, the public administration of [city name] can be trusted (ref. = somewhat agree) | | | | | |
| Strongly agree | 1.195 | 1.192 | 1.191 | 1.191 | 1.194 |
| Somewhat disagree | 0.784*** | 0.784*** | 0.785*** | 0.785*** | 0.782*** |
| Strongly disagree | 0.638*** | 0.638*** | 0.638*** | 0.638*** | 0.633*** |
| <i>Citizen level variables: opinions about a neighbourhood</i> | | | | | |
| <i>Facilities and services</i> | | | | | |
| State of streets and buildings in your neighbourhood (ref. = fairly satisfied) | | | | | |
| Very satisfied | 0.883 | 0.883 | 0.883 | 0.884 | 0.884 |
| Not very satisfied | 0.886* | 0.885** | 0.885** | 0.885** | 0.886** |
| Not at all satisfied | 0.944 | 0.942 | 0.942 | 0.942 | 0.945 |
| <i>Social aspects</i> | | | | | |
| Generally speaking, most people in my neighbourhood can be trusted (ref. = somewhat agree) | | | | | |
| Strongly agree | 0.873 | 0.871 | 0.871 | 0.872 | 0.873 |
| Somewhat disagree | 0.973 | 0.972 | 0.972 | 0.972 | 0.973 |
| Strongly disagree | 0.788*** | 0.788*** | 0.787*** | 0.787*** | 0.788*** |
| I feel safe in my neighbourhood (ref. = somewhat agree) | | | | | |
| Strongly agree | 0.997 | 0.998 | 0.998 | 0.998 | 0.997 |
| Somewhat disagree | 0.881* | 0.882* | 0.881* | 0.882* | 0.879* |

Table 4 (continued)

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|----------|----------|----------|----------|----------|
| Strongly disagree | 0.865* | 0.864* | 0.864* | 0.864* | 0.863* |
| Citizen level variables: Personal characteristics of a citizen | | | | | |
| Satisfaction with a place a respondent lives (ref. = fairly satisfied) | | | | | |
| Very satisfied | 2.228*** | 2.232*** | 2.23*** | 2.23*** | 2.228*** |
| Not very satisfied | 0.345*** | 0.345*** | 0.345*** | 0.345*** | 0.345*** |
| Not at all satisfied | 0.273*** | 0.274*** | 0.273*** | 0.273*** | 0.273*** |
| Satisfaction with financial situation of the household (ref. = fairly satisfied) | | | | | |
| Very satisfied | 0.847** | 0.85** | 0.848** | 0.848** | 0.843** |
| Not very satisfied | 0.838*** | 0.837*** | 0.837*** | 0.837*** | 0.838*** |
| Not at all satisfied | 0.749*** | 0.749*** | 0.75*** | 0.75*** | 0.751*** |
| Age group (ref. = 65+) | | | | | |
| 15–24 | 0.67*** | 0.672*** | 0.672*** | 0.672*** | 0.67*** |
| 25–34 | 0.596*** | 0.598*** | 0.598*** | 0.598*** | 0.597*** |
| 35–44 | 0.627*** | 0.629*** | 0.629*** | 0.629*** | 0.627*** |
| 45–54 | 0.633*** | 0.635*** | 0.635*** | 0.635*** | 0.632*** |
| 55–64 | 0.787*** | 0.789*** | 0.788*** | 0.788*** | 0.786*** |
| Years living in [city name] (ref. = I have lived here <1 year) | | | | | |
| All my life, | 1.465 | 1.464 | 1.465 | 1.464 | 1.464 |
| >10 years, | 1.147 | 1.148 | 1.147 | 1.146 | 1.146 |
| Between 5 and 10 years, | 0.914 | 0.915 | 0.913 | 0.913 | 0.914 |
| Between 1 and 5 years | 0.831 | 0.831 | 0.83 | 0.829 | 0.83 |
| Household composition (ref. = married or cohabiting couple and children living at home) | | | | | |
| Single person household | 0.959 | 0.962 | 0.96 | 0.959 | 0.959 |
| Married or cohabiting couple, no children living at home | 0.869 | 0.873 | 0.87 | 0.87 | 0.873 |
| Single parent, one or more children living at home | 0.922 | 0.920 | 0.919 | 0.918 | 0.919 |
| other | 0.896 | 0.900 | 0.898 | 0.898 | 0.897 |
| Gender (ref. = male) | | | | | |
| Female | 1.208*** | 1.208*** | 1.209*** | 1.209*** | 1.204*** |
| Type of community (ref. = large town) | | | | | |
| Rural area or village | 0.766*** | 0.766*** | 0.766*** | 0.765*** | 0.766*** |
| Small or middle sized town | 0.883 | 0.882* | 0.882* | 0.882* | 0.882* |
| City level variables | | | | | |
| Unemployment rate | | | 0.980* | 0.977* | 0.982 |
| GDP per capita in PPS | | 0.999 | | 0.997 | 0.997 |
| Percentages of citizens who strongly agree or somewhat agree with a statement: | | | | | |
| I feel safe in [city name] | | | | | 3.093* |
| Generally speaking, most people in my city can be trusted | | | | | 1.078 |
| Administrative services of [city name] help people efficiently | | | | | 1.67 |
| Generally speaking, the public administration of [city name] can be trusted | | | | | 0.424 |
| Population size | | 0.797 | 0.814 | 0.927 | 1.044 |
| Localisation (1 – Southern Europe; 0 – other) | | 1.157 | 1.257* | 1.201 | 1.249 |
| City level variance (std. error) | 0.158*** | 0.149*** | 0.142*** | 0.139*** | 0.109*** |
| AIC | 19,566.6 | 19,568.8 | 19,565.3 | 19,566.0 | 19,559.6 |
| BIC | 20,231.6 | 20,259.7 | 20,256.2 | 20,265.6 | 20,293.8 |
| Sample Size Adjusted BIC | 19,986.9 | 20,005.4 | 20,002.0 | 20,008.2 | 20,023.7 |
| ICC | 0.046 | 0.043 | 0.041 | 0.041 | 0.032 |

* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.

satisfied" level, they were also more satisfied with life in a city in general. This emphasises imbalance in the orientation of the associations examined with the focus on deficiencies, which is a classic example of the hygiene factor in Herzberg's Two-Factor theory (Bassett-Jones & Lloyd, 2005; Herzberg, 2003). It should be implied that the specific aspects of life in a city, enumerated above, are factors for dissatisfaction rather than satisfaction with life in a city.

Secondly, it was found that if citizens felt safe in a city and were satisfied with the place they lived in, they were also likely to be satisfied with life in the city and vice versa, implying that these two factors – feeling safe in a city and being satisfied with the place of living – have a likely influence on satisfaction with life in a city.

Thirdly, of the variables reflecting citizen opinions about facilities and features offered by the city, the following individual-level variables were identified as insignificant in association with city satisfaction: satisfaction with health care services (A1.2), cultural (A1.3) and sport facilities (A1.4), public spaces (A1.6), noise level (A2.3) and cleanliness (A2.4). Interestingly, of three variables explicitly relating to neighbourhood, i.e., state of streets and buildings (A'1.1), trustworthiness of people (A'3.2) and safety (A'3.1), only the latter appeared

significant. As regards citizens' personal characteristics, the study showed that household composition and duration of residence in a city were not associated with satisfaction with life in a city. Otherwise, age, gender, household financial situation and type of community, were significantly correlated. Satisfaction with life in a city increased with age and size of community in particular and were also greater for women and at a lower level for the disadvantaged.

Including city-level variables (model 2) further reduced the ICC. It should be noted, however, that the individual effects identified as significant in model 1 also continued to play a significant role in subsequent models. Similar reasoning applies, as to citizens' personal characteristics. Of the economic variables first used in the model (models 2–4), only unemployment rate showed expected significant relationship with satisfaction with life in a city (model 3–4). This relationship implies that an increase in the unemployment rate translates into a decrease in the odds of satisfaction with life in a city. Then, compositional variables related to social and institutional characteristics of a city were added to the model (model 5). Of all the city-level variables examined, only one appeared significantly correlated with satisfaction. This was the city specific percentage of citizens who felt safe

there. This implies that the more safe a city was perceived (i.e., the higher the share of citizens satisfied with safety in a city), the more likely a citizen was to feel satisfied with life there.

It should be noted, however, that this result may be liable to being tainted by correlations between city level variables. Therefore, a robustness check was conducted. By application of the stepwise regression with backward elimination of non-significant city level variables, using two control variables (location and population size), it was confirmed that: (1) none of the compositional variables related to the social and institutional characteristics of a city, except for the safety-related one, proved significant; (2) unemployment rate, despite being significant while introduced independently, was not significant in combination with other variables. These findings show that perception of city safety is more likely to have greater explanatory power for satisfaction with life in a city than other contextual and compositional city-level variables.

5. Discussion

In this paper, an empirical attempt was made to investigate importance of specific citizen, neighbourhood and contextual city factors on urban quality of life. In answer to the second research question, findings identified specific citizen factors describing city features:

- 1) influencing satisfaction with life in a city – feelings of safety in the city, about the financial situation and the place of living;
- 2) influencing dissatisfaction with life in a city – issues related to public transport, cultural facilities, green spaces, availability of retail outlets, air quality, efficiency of public administration or trustworthiness of public administration, people living in a city and in the neighbourhood;
- 3) not influencing satisfaction with life in a city – issues related to health care services, sport facilities, public spaces, noisiness and cleanliness.

To the third group two of the three examined neighbourhood features – state of streets, buildings and trustworthiness of people in a neighbourhood – were also included. This finding, however, does not preclude the importance of quality of the neighbourhood from urban quality of life. In the entire survey there were only three questions related to the neighbourhood (out of 38), which, due to framing effects (Kahneman, 2011), likely influenced respondents to adopt more of a city-oriented, rather than a neighbourhood perspective to the survey and thus attach more importance to city specific issues. Indeed, when the same analysis was repeated using satisfaction with place of residence as the outcome variable,⁴ the results were the reverse.⁵ Namely, for all three neighbourhood related questions, results showed that neighbourhood-related issues were significantly associated with satisfaction with living in a place while insignificant in assessment of the city perspective. Consequently, our results confirm that positive social attitude towards other citizens correlates positively with satisfaction with a city (Insch, 2010; Zenker, Eggers, et al., 2013), and positive social attitude towards neighbours correlates positively with satisfaction with local area (Herting & Guest, 1985) and with neighbourhood (Parkes et al., 2002). This reasoning shows that both city and neighbourhood perspectives are important. However, the means of inquiry is of crucial importance for validity. This, in turn, implies that any answer to the third research question is not straightforward.

With respect to citizen characteristics, we found that duration of residence, city of birth and household composition were not significantly associated with satisfaction from life in a city. This was rather surprising. According to *Insch and Florek (2010)*, there are significant differences in

satisfaction with city life between newcomers and long-term residents; newcomers being especially critical or dissatisfied during their first year of residence. Regarding household composition, we were not able to confirm *Herting and Guest (1985)* or *Lee and Guest (1983)* who claimed that childrearing households differed from childless households in their perception of neighbourhood or local area satisfaction. However, our study mostly reflected city life and not life in the neighbourhood and this may explain the discrepancies. This study supports well-documented relationships between city satisfaction and age. With age, propensity for satisfaction with life in a city increased. This, however, did not extend to the youngest group of citizens aged 15–24, for whom the odds ratio for satisfaction was the second highest (following the group of 55–64 years). Nevertheless, these results were in line with *Insch and Florek (2010)* whose general finding was that age was positively associated with city satisfaction. Finally, this study demonstrated considerable variation in satisfaction with life in a city, not only within European city populations but also between cities. This confirms the arguments of *Morrison (2007)*, that satisfaction with life in a city is influenced not only by citizen opinions and citizen characteristics but is also moulded by the characteristics of the city itself. In this study the most influential city feature was the percentage of citizens satisfied with the safety in a city (i.e., a compositional variable), which also supplies an answer to the first research question.

The major limitation of this study is that it could not illuminate causality of relationships between aspects of city life and satisfaction associated with living in a city. The nature of the data and methodology only permitted correlation based conclusions. One approach to overcome this would be to apply instrumental variables (*Angrist & Krueger, 2001*). Only after this step were to be accomplished, could each identified relationship be established as – causative or purely associative – in nature. However, the implication for this study would have been to propose at least one instrumental variable that satisfies the necessary conditions for a valid instrument for each relationship. This was not attainable for this study.

Beyond the findings and limitations reported above, the study offered three novel insights. Firstly, drawing from the data on 83 European cities, the findings are more general than those drawn from one city or from cities in a single country, supplying a pan-European perspective. Secondly, a two-level modelling framework simultaneously examined associations between satisfaction with life in a city and aspects of city life, as perceived from the perspective of the citizen and the city context, which sheds a new light on factors associated with urban quality of life. Namely, the results indicate a ‘city effect’ associated mainly with average level of safety. Thirdly, lack of institutional aspects of city life, namely trustworthiness and efficiency of public administration, which were missing from recent studies, proved significantly associated with perceived dissatisfaction with life in the city.

Appendix

Table A1

Percentage of persons who ‘strongly agree’ or ‘somewhat agree’ with the statement ‘I am satisfied with life in [city name]’ in European cities (with standard errors).

| City | Country | Percentage of people who ‘strongly agree’ or ‘somewhat agree’ | Standard error |
|-----------|----------------|---|----------------|
| Graz | Austria | 0.96 | 0.009 |
| Wien | Austria | 0.95 | 0.010 |
| Antwerpen | Belgium | 0.90 | 0.013 |
| Brussel | Belgium | 0.83 | 0.017 |
| Liege | Belgium | 0.81 | 0.017 |
| Burgas | Bulgaria | 0.95 | 0.010 |
| Sofia | Bulgaria | 0.84 | 0.016 |
| Zagreb | Croatia | 0.92 | 0.012 |
| Lefkosia | Cyprus | 0.86 | 0.015 |
| Ostrava | Czech Republic | 0.79 | 0.018 |
| Praha | Czech Republic | 0.90 | 0.013 |

⁴ Question about satisfaction with life in a neighbourhood variable is not available in the survey.

⁵ Results are not presented here but are available upon request.

Table A1 (continued)

| City | Country | Percentage of people who 'strongly agree' or 'somewhat agree' | Standard error |
|-------------------------|----------------|---|----------------|
| Aalborg | Denmark | 0.99 | 0.004 |
| Kobenhavn | Denmark | 0.97 | 0.008 |
| Tallinn | Estonia | 0.89 | 0.014 |
| Helsinki | Finland | 0.92 | 0.012 |
| Oulu | Finland | 0.96 | 0.009 |
| Bordeaux | France | 0.93 | 0.011 |
| Lille | France | 0.87 | 0.015 |
| Marseille | France | 0.75 | 0.019 |
| Paris | France | 0.83 | 0.012 |
| Paris Surroundings | France | 0.81 | 0.000 |
| Rennes | France | 0.94 | 0.011 |
| Strasbourg | France | 0.91 | 0.013 |
| Berlin | Germany | 0.93 | 0.011 |
| Dortmund | Germany | 0.93 | 0.011 |
| Essen | Germany | 0.93 | 0.011 |
| Hamburg | Germany | 0.98 | 0.006 |
| Leipzig | Germany | 0.96 | 0.009 |
| Munich | Germany | 0.96 | 0.009 |
| Rostock | Germany | 0.96 | 0.009 |
| Athina surroundings | Greece | 0.59 | 0.000 |
| Athina | Greece | 0.57 | 0.016 |
| Irakleio | Greece | 0.88 | 0.015 |
| Budapest | Hungary | 0.84 | 0.016 |
| Miskolc | Hungary | 0.73 | 0.020 |
| Reykjavik | Iceland | 0.96 | 0.009 |
| Dublin | Ireland | 0.90 | 0.013 |
| Bologna | Italy | 0.90 | 0.013 |
| Napoli | Italy | 0.65 | 0.021 |
| Palermo | Italy | 0.71 | 0.020 |
| Roma | Italy | 0.80 | 0.018 |
| Torino | Italy | 0.84 | 0.016 |
| Verona | Italy | 0.95 | 0.010 |
| Riga | Latvia | 0.84 | 0.016 |
| Vilnius | Lithuania | 0.93 | 0.011 |
| Luxembourg | Luxembourg | 0.95 | 0.010 |
| Valletta | Malta | 0.88 | 0.014 |
| Amsterdam | Netherlands | 0.96 | 0.009 |
| Groningen | Netherlands | 0.97 | 0.008 |
| Rotterdam | Netherlands | 0.91 | 0.013 |
| Oslo | Norway | 0.97 | 0.008 |
| Białystok | Poland | 0.95 | 0.010 |
| Gdansk | Poland | 0.94 | 0.011 |
| Krakow | Poland | 0.95 | 0.010 |
| Warszawa | Poland | 0.90 | 0.013 |
| Braga | Portugal | 0.95 | 0.010 |
| Lisboa | Portugal | 0.91 | 0.009 |
| Lisboa surroundings | Portugal | 0.91 | 0.000 |
| Bucuresti | Romania | 0.82 | 0.017 |
| Cluj Napoc | Romania | 0.96 | 0.009 |
| Piatra Nea | Romania | 0.95 | 0.010 |
| Bratislava | Slovakia | 0.86 | 0.016 |
| Kosice | Slovakia | 0.92 | 0.012 |
| Ljubljana | Slovenia | 0.90 | 0.013 |
| Barcelona | Spain | 0.90 | 0.013 |
| Madrid | Spain | 0.86 | 0.016 |
| Malaga | Spain | 0.96 | 0.009 |
| Oviedo | Spain | 0.94 | 0.011 |
| Malmo | Sweden | 0.93 | 0.011 |
| Stockholm | Sweden | 0.96 | 0.009 |
| Geneva | Switzerland | 0.89 | 0.014 |
| Zurich | Switzerland | 0.97 | 0.008 |
| Ankara | Turkey | 0.91 | 0.013 |
| Antalya | Turkey | 0.90 | 0.013 |
| Diyarbakir | Turkey | 0.82 | 0.017 |
| Istanbul | Turkey | 0.79 | 0.018 |
| Belfast | United Kingdom | 0.93 | 0.011 |
| Cardiff | United Kingdom | 0.95 | 0.010 |
| Glasgow | United Kingdom | 0.92 | 0.012 |
| London | United Kingdom | 0.87 | 0.015 |
| Manchester | United Kingdom | 0.90 | 0.009 |
| Manchester surroundings | United Kingdom | 0.90 | 0.000 |
| Tyneside conurbation | United Kingdom | 0.94 | 0.011 |

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