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## The Mediating Role of Urbanization on the Composition of Happiness

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# The Mediating Role of Urbanization on the Composition of Happiness\*

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**Abstract:** This paper investigates whether urbanization plays a role in determining the importance of each happiness domain on overall happiness. The analysis focuses on Italy. We exploit a multilevel model to consider regional heterogeneity in happiness's determinants. We first verify whether a direct effect of urbanization exists on each specific components of happiness, as well as on overall happiness. Consistent with the findings in the literature, happiness decreases with urbanization. In the analysis of mediating role, we find that the importance of satisfaction with economic conditions and family explains more overall happiness in urban areas. On the contrary, satisfaction with health, friendships and environment gain more weight in rural areas.

**Keywords:** subjective well-being, happiness function, urbanization, regions, multilevel models.

**JEL codes:** I31, R10

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## 1. Introduction

The past decades have recorded a sharp increase in the levels of urbanization. In 1950, urban population accounted for the 30% of total population in the world, which increased to 54% in 2014 and it is expected to raise further to 66% in 2050. The increasing concentration of people in large cities has stimulated an intense debate about the consequences of urbanization, among both academics and urban planners. In particular, a rich stream of empirical contributions has investigated how the degree of urbanization affects subjective well-being.<sup>1</sup> Within this literature, an empirical regularity outlines a negative relationship between the level of urbanization and happiness.

This result, however, is based on frameworks that set aside the role played by the specific aspects of happiness, so that it says little about how the latter are affected by urbanization. In fact, subjective well-being is a multidimensional concept, which encompasses happiness in the different aspects of life. In happiness studies, it is standard to refer to the so-called “happiness function”, according to which overall subjective well-being is assumed to be influenced by satisfaction in the single aspects of life (Blanchflower and Oswald, 2004). So far, such feature has not been exploited in the literature that links the degree of urbanization and

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<sup>1</sup> In this paper, happiness is measured using overall satisfaction. This approach follows much of the happiness literature (van Praag et al., 2003, Kalmijn and Veenhoven, 2005, and Veenhoven 2012, *among others*). In particular, Veenhoven (2012) states: “[subjective well-being] ... is an umbrella term for all that is good. In this meaning, it is often used interchangeably with terms like 'well-being' or 'quality of life' and denotes both individual and social welfare”. In line with this view, we will use the terms ‘subjective well-being’, ‘happiness’ and ‘life satisfaction’ interchangeably.

happiness, since specific measures of satisfaction on various aspects of life are typically not included as regressors together with the level of urbanization.<sup>2</sup> Indeed, a main advantage of such approach is that it potentially allows to investigate how specific happiness spheres are affected by urbanization. Another, more subtle advantage in the use of happiness domains is that it allows to investigate whether urbanization plays a role at explaining the composition of happiness. We argue that urbanization has a “mediating role” if the importance of the happiness spheres at explaining overall satisfaction changes with the level of urbanization. Through this approach, we may be able to explain the role played by each domain to determine the empirical regularity of a negative relationship between urbanization and overall happiness.

An example might be handy to clarify the idea. Consider a setting with one city and the countryside. We may reasonably expect that, in the countryside, environmental features are better than in the city. In turn, we might expect that individuals who live here are more satisfied for the environment than those who live in the city. It follows that the happiness due to environment will have a stronger weight to explain overall happiness in the countryside than in the city. By contrast, the city likely offers more economic opportunities, either as jobs or investments. For this reason, we might expect that the happiness due to economic

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<sup>2</sup> In this definition of subjective well-being, another component is emotional aspects (“affects”), which are caught by the error term.

conditions will be more important to explain overall happiness in the city than in the countryside.

Given these premises, the aim of this paper is to verify the mediating role of urbanization to determine the interplay between urbanization and happiness domains. The first, preliminary question is how urbanization affects each happiness domain, as well as overall happiness. This exercise will help us to understand the direct effect of urbanization on each of them, and whether the negative relationship between urbanization and happiness is verified in our analysis. Once we ascertained the presence of a direct effect, we may take a step further and evaluate the mediating role of urbanization.

The impact of urbanization on overall well-being is analyzed using a proper specification of the happiness function. We include a comprehensive set of happiness domains such as: satisfaction with economic conditions, job, family, friends, spare time, health and environment. In doing so, we acknowledge that overall happiness is composed by well-being in different aspects of life.

From a methodological point of view, we employ a multilevel analysis model with random intercept and random slopes to take into account of regional level heterogeneity of happiness. Our multilevel framework enables us to assume that the coefficients of happiness domains depend on the degree of urbanization.

Our analysis focuses on Italy. Ever since the 1980s, almost the 70% percent of the Italian population lived in cities, by which time the flow of migration from rural

areas ceased (Malanima, 2005). For the purpose of our analysis, this implies that Italy represents a stable context which does not suffer from substantial migration shocks in the period covered by our data.<sup>3</sup>

Consistent with the findings of the literature, the analysis on the direct effect of urbanization on happiness shows a negative relationship. Next, we confirm a mediating role of urbanization at explaining the composition of happiness: economic conditions and family relationships matter more for those living in urban areas, while health conditions, friendships and the environment gain a larger weight for those living in rural areas. These results are robust to a number of checks.

The remainder of the paper is organized as follows. Section 2 surveys some of the related literature. Section 3 illustrates the dataset and the variables considered. Section 4 describes the research method: the preliminary analysis regards the evaluation of the direct effect of urbanization on each domain and overall happiness. Then we formalize the concept of the happiness function and how it is implemented to verify the mediating role of happiness. We finally outline the methodological issues and how we deal with them. Section 5 presents the results, while concluding remarks can be found in Section 6.

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<sup>3</sup> Unfortunately, our dataset lacks the information to further control for spatial sorting.

## 2. Literature

The present paper is related to two strands of the literature, namely, the literature on the analysis of happiness, and the literature that explores the relationship between urbanization and happiness.

In the literature on happiness, Frey and Stutzer's (2000) distinguish three types of variables as possible determinants: individual, macroeconomic and institutional variables. Originally, the main macroeconomic variables analyzed were GDP (Easterlin, 1974, Burchardt, 2005 and Clark et al., 2008, among others), unemployment and inflation (Di Tella et al. 2001, and Blanchflower, 2007) and inequality (Alesina et al., 2004, and Alesina and La Ferrara, 2005). However, in the recent years, there has been a growing interest towards the effects of urbanization on happiness, so that it may be listed as another of the most relevant macroeconomic variables.

In early studies, the degree of urbanization was included in the socio-economic variables. Gerdtham and Johannesson (2001) examine the effects of a host of socio-economic factors on happiness in Sweden during the 1991. They find that happiness decreases with urbanization. Peiró (2006) exploit data of 15 countries to analyze differences in the determinants of happiness. He does not find any significant evidence on effects on happiness based on differences in the level of urbanization. Hayo (2007) analyzes the effects of economic transition in Eastern Europe on happiness, showing a significant and positive effect of living in small communities in explaining subjective well-being. The effects of economic

transition on happiness have been evaluated also by Kalyuzhnova and Kambhampati (2008) in Kazakhstan, reporting not significance of urbanization. Others works that find no significant relationship between urbanization and well-being are Appleton and Song (2008) and Rehdanz and Maddison (2005). More recently, Rodriguez-Pose and Maslauskaitė (2012), in a work on the institutional factors as determinants of well-being, underline that living in big cities is related to a lower level of happiness.

Other contributions have focused on the indicator of urbanization as the key determinant of happiness. Brereton *et al.* (2011) report high levels of life satisfaction in rural Ireland. Knight and Gunatilaka (2010) investigate the effects of income disparity in China between urban and rural areas with respect to subjective well-being. They find that people living in rural areas report, by contrast, higher happiness than those living in urban areas. A similar result is found by Soresen (2014), who analyzes rural-urban differences in happiness across the European Union in the 2008. By contrast, Lenzi and Perrucca (2016) find that subjective well-being is higher in European regions with intermediate levels of urbanization. Requena (2016) compares 29 countries to determine how the degree of urbanization is linked to the level of the development of the country. He finds that rural areas of developed countries yield a higher level of happiness, but not in developing countries.<sup>4</sup> Finally, Lenzi and Perrucca (2016b)

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<sup>4</sup> Easterlin *et al.* (2011), Berry and Okulicz-Kozaryn (2011, 2009) and Shucksmith *et al.* (2009) report similar findings.



investigate the effects of the proximity of rural areas to cities of different sizes. They find that proximity to large cities helps explaining the well-being of residents in rural areas. These papers discussed so far adopted measures of urbanization based on population size of the region considered.

Like these contributions, this paper examines the effect of urbanization of overall happiness. In addition, to the best of our knowledge, this is the first paper that investigates the relationship between different happiness domains and the level of urbanization. Moreover, our question about the mediating role of urbanization is new. The general interpretation of these studies is that urbanization brings about both economies and diseconomies, where the latter have a stronger effect on life satisfaction above a certain population threshold (Okulicz-Kozaryn, 2015). The present paper may disentangle these effects by investigating how the weight of each satisfaction domains vary with urbanization to explain happiness. In this way, our strategy aims at understanding how different urbanization economies and diseconomies impact life satisfaction. This evidence is a step forward compared to the recognition of an overall negative effect of urbanization on life satisfaction.

From a methodological point of view, we exploit a multilevel model to take into account of the variability of urbanization in Italian regions. Multilevel models are largely applied in spatial analysis when territorial features are considered as a higher-level effect on individual aspects of life (Aslam and Corrado, 2012; Oswald and Wu, 2010; Pittau et al., 2010; *among others*). In the literature of

urbanization and happiness, this approach has been adopted by Shucksmith *et al.* (2009), who analyze the effects of urbanization on happiness in Europe. They consider first an empty model with only the urbanization indicator (a binary measure “rural-urban”), and then add all the socio demographic covariates and other criteria representing quality of life (occupation, housing, income, and so on). They exploit random intercept and random slope over the urbanization indicator. They do not find any significant difference in happiness based on differences in the degree of urbanization.

### **3. Data**

Individuals’ happiness and socio-demographic characteristics are extracted from the ‘Multipurpose Survey on Households: Aspects of Daily Life’ (HADL), carried out by the Italian Office of Statistics (ISTAT). HADL is a large repeated cross-sectional sample survey that covers the resident population in private households, collecting annual information on individual and household daily life. The sample considers about 150,000 Italian residents over the period 2010 to 2013. The survey provides information on citizens’ habits and everyday aspects of life. In the questionnaires, the thematic areas dwell on different social aspects, allowing to determine the quality of individual life and the degree of satisfaction of their conditions. Moreover, the survey offers a wide set of socio-demographic characteristics of residents (gender, age, marital status, household composition),

educational level (if the respondent achieved a high school diploma), economic condition (job occupation, retirement, principal resource of income).

From a geographical perspective, Italy is administratively divided in 20 regions. Information about the region of residence is available in HADL, as well as the size of the town in terms of population where residents live. We include region of residence as the second level in the multilevel model (see the next section).

### **Measure of urbanization**

The HADL considers information of the population size of the council of residence. It is categorized in 5 size-dimensions, where the value “1” corresponds to councils with less than 2,000 inhabitants, “2” corresponds to councils with more than 2,000 inhabitants and less than 10,000 inhabitants, “3” corresponds to councils with more than 10,000 inhabitants and less than 50,000 inhabitants, “4” corresponds to councils with more than 50,000 inhabitants, “5” to suburbs of metropolitan areas and “6” to city centers of metropolitan areas. In literature, there is not a general consensus for the definition of rural/urban.<sup>5</sup> Following De Rubertis (2019), who shows a depopulation in rural areas of Italy, we define as “rural” those councils with less than 10,000 inhabitants and the rest as “urban”.

Insert Table 1

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<sup>5</sup> See, among others, Shucksmith *et al.* (2009), Knight and Gunatilaka (2010), Kalyuzhnova and Kambhupati (2008), Kytta *et al.* (2016), each of which exploit a different measure.

Detailed information on variables and descriptive statistics are presented in Table 1. Life satisfaction is measured with the question: 'At this moment, how much are you satisfied with your life overall?' on a Likert- scale (where 0 is the lowest and 10 the maximum level of satisfaction). The HADL also observes citizens' satisfaction with respect to the different domains of their life, by using a 4-point Likert scale: satisfaction with economic conditions, health, relationship with family and friends, spare time, environment, and job.

Overall, life satisfaction over the period 2010-2013 equals 7.01, evidencing a high happiness of Italian citizens even if it reduced over time in concomitance of the Financial Crisis. As for life domains, relationships with family and friends are the domains obtaining the highest scores of satisfactions, followed by health conditions; activities during leisure time, work and environment are in the subsequent positions of the ranking. Satisfactions for the economic condition obtain the lowest score of the satisfaction ranking.

Differences in happiness has been detected with respect to the region of residence (Table 2). Subjective well-being tends to decrease as we move to the southern regions, which are characterized by lower level of GDP and employment rate as well as by a different morphological and naturalistic aspect.

Table 2 also shows the share of councils with more than 10,000 inhabitants. This is not uniform across Italian regions, and motivates the adoption of a multilevel model with regions as second level. Moreover, the correlation between happiness

and share of urbanized councils is negative, consistent with what expected from the literature.

Insert Table 2

#### **4. Research method**

In this section we describe the methodology adopted over the analysis. The preliminary task is to show the direct effect of urbanization on the single happiness domains and overall happiness. Next, we introduce the happiness function as a tool to relate domains with overall happiness. The econometric strategy to investigate the mediating role of urbanization is then outlined. Finally, we discuss the methodological issues and how we dealt with them.

##### **The direct effect of urbanization**

In this section we outline the strategy to verify if there exist a direct effect between urbanization and each happiness domain/ overall happiness. This exercise is necessary to motivate our question about the mediating role: if urbanization does not play any role at explaining happiness, then the analysis of mediating would make no sense. In addition, this analysis is helpful to compare our results with those in the literature, who mainly focus on the direct effect. Thus, our hypothesis is the existence of a relationship between happiness and urbanization:

$$O = f(Urb) \tag{1}$$

where  $O \in \{DS_a, H\}$  denotes the domains' satisfactions for the different life aspects ( $DS_a, a=1, \dots, A$ ) and overall happiness ( $H$ ). To take into account the marginal effect of urbanization, we assume:

$$O = Urb^{\alpha_u}. \quad (2)$$

where  $Urb$  is the variable related to urbanization. If  $\ln O$  is the logarithm of satisfaction, the importance of Urbanization (in their logarithm) can be obtained from the estimated coefficients of the following function:

$$\ln O = \alpha_0 + \alpha_z Z + \alpha_u Urb + v \quad (3)$$

where  $Z$  is a set of socio-demographic variables. We estimate equation (3) through a multilevel model (MLM) framework. In the present analysis, the use of MLM allows to account for the variability of urbanization among Italian regions. In the next model, we refer the subscript  $i$  to the first level (individuals) and  $j=1, \dots, 20$ , to the second level in the hierarchy, given by the 20 Italian regions:

$$\begin{aligned} y_{ij} &= \alpha_{0j} + \alpha_z Z + \alpha_u Urb + v_{ij}, \quad v_{ij} \sim N(0, \sigma_v^2) && \text{Level 1} \\ \alpha_{0j} &= \alpha_{00} + \epsilon_{0j}, \quad \epsilon_{0j} \sim N(0, \sigma_\epsilon^2) && \text{Level 2} \end{aligned} \quad (4)$$

where the error term  $v_{ij}$  captures idiosyncratic individual factors that may influence individual satisfaction. Equation (4) is specified to include a second

level, where the spatial level intercept is modelled as the sum of an overall mean and a series of random deviations from the mean.

With the model in (4), we are able to determine the effects of urbanization on overall happiness, in a similar way as in the literature, so that our results can be compared with it. We are also able to detect if the marginal effect of urbanization on happiness changes among the different life domains. If this is the case, we can suggest that urbanization may have a mediating role in the composition of the happiness function.

### **The happiness function**

One of the most accepted method to analyze happiness assumes that subjective well-being is a combination of various spheres of satisfactions (Diener 1984; Diener et al. 1999; Sirgy 2002; van Praag et al. 2003; van Praag 2007, 2011). Based on this approach, happiness may be expressed as a function of different domains of satisfaction (van Praag, 2007, 2011, and van Praag *et al.*, 2003), such as:

$$H = f(DS_1, \dots, DS_A) \tag{5}$$

The happiness function explicitly recognizes the role of different aspects of life in explaining subjective well-being. This is particularly relevant in the present analysis, where we are interested in understanding not only the role of urbanization in explaining happiness, but also which aspects are ultimately affected by it.

Following Bernini and Tampieri (2019), in our analysis, we assume a Cobb-Douglas specification:

$$H = \prod_{a=1}^A DS_a^{\beta_a}. \quad (6)$$

Equation (6) takes into account the levels of substitutability among the happiness domains, where  $\beta_a$  is the elasticity of domain  $a$ .

We adopt the “hedonic weights approach” (Schokkaert, 2007), according to which, if  $\ln H$  and  $\ln DS_\alpha$  are the logarithm of the overall satisfaction and life domain respectively, the role of each satisfaction aspect may be obtained from the estimated coefficients of the following happiness function:

$$\ln H = y = \beta_0 + \beta_\alpha \ln DS_\alpha + \beta_z Z + \beta_u Urb \quad (7)$$

In Eq. (7), we enlarge the usual happiness function by considering explicitly the role that urbanization has on the citizens’ happiness, together with the set of socio-demographic variables.

### **The mediating role of urbanization**

Like for the analysis of the direct effect, we adopt a MLM framework. However together with the inclusion of the second level mean-effects, we also verify the random variations in the slopes of satisfaction domains. Finally, to verify the mediating role of urbanization, we include urbanization in the random slopes of each domain. In this way, we may tell how the weight of each domain is influenced by the level of urbanization to explain happiness. To highlight the role



played by urbanization at explaining each happiness domain, the measure of urbanization is, in this case, included in the second level:

$$\begin{aligned}
 y_{ij} &= \beta_{0j} + \beta_{1j} \ln DS_{ij} + \beta_z Z_{ij} + \varepsilon_{ij}, \quad \varepsilon_{ij} \sim N(0, \sigma_\varepsilon^2) && \text{Level 1} \\
 \beta_{0j} &= \gamma_{00} + u_{0j}, \quad u_{0j} \sim N(0, \sigma_{u_0}^2) && \text{Level 2} \\
 \beta_{1j} &= \gamma_{10} + \gamma_{11} Urb_{ij} + u_{1j}, \quad u_{1j} \sim N(0, \sigma_{u_1}^2) && (8)
 \end{aligned}$$

### **Methodological issues**

In the analysis of the previous section, two estimation problems may arise. First, the Level-1 explanatory variables could be correlated with the cluster means. This issue may be solved with the adoption of the mean-centered Level-1 covariates as instrumental variables (Snijders and Berkhof, 2008; Hox, 2010). Second, the use of repeated cross-sectional data at different levels of aggregation may cause problems of endogeneity (Aslam and Corrado, 2012). However, if the unobserved heterogeneity at the group-level is correlated with the covariates, the residual correlation may be erased by adding the group means of the regressors (Mundlak, 1978).

Thus, the Level 1 equation in the model (8) is specified to control for both the mean level of the domains' happiness at regional level, and the individual deviation from the mean:

$$\begin{aligned}
y_{ij} &= \beta_{0j} + \beta_{1j}(DS_{ij} - \overline{DS}_j) + \beta_z Z_{ij} + \varepsilon_{ij}, \quad \varepsilon_{ij} \sim N(0, \sigma_\varepsilon^2) && \text{Level 1} \\
\beta_{0j} &= \gamma_{00} + \beta_{10j} \overline{DS}_j + u_{0j}, \quad u_{0j} \sim N(0, \sigma_{u0}^2) && \text{Level 2} \\
\beta_{1j} &= \gamma_{10} + \gamma_{11} Urb_{ij} + u_{1j}, \quad u_{1j} \sim N(0, \sigma_{u1}^2) && (9)
\end{aligned}$$

where  $\overline{DS}_j$  is the group  $j$  mean of each satisfaction domain, while  $(DS_{ij} - \overline{DS}_j)$  is the individual centered satisfaction domain, for every  $i$ . This model specification also allows us to analyze whether satisfactions at the regional level exert a different impact on citizen well-being with respect to the centered individual-level factors. Indeed, comparing the two parameters for each happiness sphere may help explain how an individual's relative position affect his happiness with respect to regional mean. In the results section, the analysis is carried out by estimating model (9).

Several statistics are used for the model evaluation. The first is the Likelihood Ratio (LR<sub>1</sub>), which compares the estimated model to the linear model. The second statistic is the Intraclass Correlation Coefficient (ICC), which returns the amount of total variance accounted for by the variance between classes. We also check for possible endogeneity problems. At the Level- 1, we employ Van Praag et al. (2003)'s methodology within a linear model approach, and we extend it to the MLM framework (Bernini and Tampieri, 2019). We briefly describe the main steps. First, we employ the estimation of the direct effects for each satisfaction

domain (see models in Eq(4)). Second, we perform a factor analysis on the residuals of the 7 domains. In this way, we estimate the part that is common to all residuals and employ it as an instrument for checking the role of endogeneity. Third, we implement the first principal factor of the error residuals as an additional variable in the estimation of the happiness function. If this instrument is not significant, then the error is no longer correlated with the domain and the estimators do not suffer from endogeneity bias at level 1. Finally, once we have estimated the model, we may use the Hausman test to verify endogeneity bias at Level-2. If the null hypothesis that the random effects are not correlated with any covariates holds, the estimates of the coefficients are both consistent and efficient.

## **Results**

Table 3 shows the direct effect of urbanization on single domains and overall happiness. Consistent with the existing literature, the relationship between overall happiness and urbanization is negative and significant. The positive externalities of urbanization in terms of job opportunities and services are not so relevant to balance the negative externalities generated by largest cities.

In addition, our results show that urbanization is negatively related with each happiness domain, with the exception of "spare time". Note that the intensity of the marginal effect of urbanization on satisfaction is different across life domains. Urbanization highly affects satisfaction for the environment, while it is negligible

in respect to health; economic conditions and social relationships show a negative marginal effect higher than that observed for the overall life.

These preliminary results thus confirm the presence of a direct effect of happiness on life domains, which is heterogeneous in respect to life aspects. We now verify, with the help of the happiness function, if urbanization also plays a mediating role to explain the composition of happiness.

Insert Table 3

Table 4 shows the estimation of the happiness function. The model satisfies both  $LR_1$ ,  $LR_2$  and ICC, implying the robustness of our estimates. We accept the null of not endogeneity bias at level 1; at level 2, the Hausmann test also confirms the lack of endogeneity.

The role played by socio-demographic and economic variables appear to be important to explain life satisfaction, and all look significant. The results seem intuitive: life satisfaction increases with education, having a partner, having kids and a job, while it decreases with age, being separated, divorced or widowed, and when children turn older than 25.

Satisfaction domains are positive and significant, suggesting that the happiness function is a good identification strategy for overall subjective well-being. The most relevant aspect is health conditions, followed by economic conditions and job satisfaction at very similar levels. Satisfaction with family has a slightly lower impact on overall satisfaction. Finally, the responses of happiness to the leisure

time and friendships have is lower; satisfaction with respect to environment exhibit the lowest influence on individual well-being.

These results are partly consistent with Aslam and Corrado (2012), who underlined that non-economic factors have a larger effect on citizens' well-being.

In our analysis, the most important domain is health, but it is immediately followed by economic and job conditions (Easterlin and Sawangfa, 2007).

Next, we evaluate the presence of the mediating role of urbanization. Interestingly, we find that urbanization has contrasting effects on overall happiness when combined with the different life domains, confirming the existence of a mediating role of urbanization.

First, the role played by the satisfaction for the economics condition on happiness increases with urbanization. This result seems natural, given that urbanization brings job opportunities, through industrialization, improvements in services and access to amenities such as healthcare and education. The weight of job satisfaction on overall satisfaction is not affected by urbanization, its effect could be captured in the relationship with economic conditions.

A less intuitive result is that the importance of family relations appears to be positively related to urbanization. It is widely accepted that the traditional family has suffered the increase of urbanization, although new forms of family emerged. Urbanization brings about fertility and family size reduction (Unchs, 1994). A

possible interpretation is that frenetic urban life makes individuals evaluate more the time spent with family members.

Health and environment are negatively related to overall happiness when associated to an increase in urbanization. Both results are intuitive: large populations help the spread of pathologies (Fitzpatrick and La Gory, 2013),<sup>6</sup> while urbanization has well-known negative effects on environment (Newman 2006, *among others*). Similarly, satisfaction with friends plays a less important role to explain happiness in urbanized areas. The negative coefficient of friendship satisfaction may be interpreted that strong urbanization does not help at build up friendships. Finally, urbanization does not mediate the impact of spare time satisfaction on citizen well-being.

Insert Table 4

The adoption of a MLM allows to check for regional differences (Variances by region). After controlling for individual characteristics, domains' satisfaction and urbanization effects across regions, the variability of the intercept is still. Then, unexplained regional-level variability of the estimated life satisfaction is still present, indicating that other local economic and social aspect as well as amenities may influence happiness. In addition, the variability of the slopes of domains is significant, which indicates a considerable variability in the

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<sup>6</sup> See also Choldin (1978) for an overview of the literature.

composition of happiness across Italian regions. These findings reflect the natural, social and economic varieties of the Italian territory.

### **Concluding remarks**

In this paper we have explored the role played by urbanization at determining the composition of happiness. First, we have verified that urbanization has a direct effect on happiness. Consistent with many results in the literature, a negative and significant relationship emerged, not only between urbanization and overall happiness, but also between urbanization and each of the happiness domains available.

In our main analysis, we have employed the happiness function to determine whether the weights of different domains on overall happiness is indeed influenced by the level of urbanization. Our results confirmed our hypothesis. In particular, the importance of satisfaction with economic conditions and family explains more overall happiness in urban areas. On the contrary, satisfaction with health, friendships and environment gain more weight in rural areas.

From a policy perspective, our results suggest that urban planners should pay attention to the effects of urban development on different aspects of well-being. Indeed, our results show that a different level of urbanization impact citizens' happiness differently, suggesting that policy plans will differ according to these

differences. Being aware of these trade-offs may help designing better urban policies.

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Table 1. Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	Max	
Life satisfaction	148,926	7.014	1.724	0	10	Currently, how do you feel satisfied of your life overall?
Year	152,184	2011.479	1.119	2010	2013	
<b>Demographics (yes=1, no=0)</b>						
Male	152,184	0.483	0.500	0	1	
Age, 25-34	152,184	0.139	0.346	0	1	
Age, 35-44	152,184	0.187	0.390	0	1	
Age, 45-54	152,184	0.190	0.392	0	1	
Age, 55+	152,184	0.395	0.489	0	1	
Children: 0-17y	152,184	0.271	0.444	0	1	
Children: 18+y	152,184	0.441	0.496	0	1	
Separated/divorced	152,184	0.073	0.260	0	1	
Widowed	152,184	0.080	0.271	0	1	Widowed
Higher education	152,184	0.124	0.330	0	1	Education: higher than high school
<b>Economic (yes=1, no=0, number of holidays: 0-30)</b>						
Employed	152,184	0.444	0.497	0	1	
Retired	152,184	0.213	0.409	0	1	
Job satisfaction respondents	152,184	0.442	0.497	0	1	

(continued)

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**Specific satisfaction (Fully satisfied=4, not at all=1)**

Satisfaction with economic conditions	149,422	2.326	0.763	1	4
Satisfaction with health status	149,318	2.953	0.681	1	4
Satisfaction with family	149,158	3.270	0.629	1	4
Satisfaction with friends	149,161	3.073	0.691	1	4
Satisfaction with spare time	149,059	2.729	0.781	1	4
Satisfaction with environment	149,611	2.807	0.726	1	4
Satisfaction with job	84,861	2.850	0.715	1	4

**Urbanization**

Urbanization	152,184	0.641	0.479	0	1	Based on council size: 0=Rural ( $\leq 10,000$ ), 1=Urban ( $>10000$ );
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Table 2. Happiness across Italian regions

	Happiness	% of councils by region with more than 10,000 in habitants
Piemonte	7.06	6.3%
Valle d'Aosta	7.17	1.4%
Lombardia	7.15	12.2%
Bolzano/Trento	7.63	6.7%
Veneto	7.07	23.1%
Friuli-Venezia Giulia	7.10	11.4%
Liguria	7.12	9.4%
Emilia-Romagna	7.06	28.7%
Toscana	6.99	30.7%
Umbria	6.99	20.7%
Marche	7.07	14.2%
Lazio	6.83	20.1%
Abruzzo	7.02	8.9%
Molise	7.00	2.9%
Campania	6.58	23.2%
Puglia	6.82	42.6%
Basilicata	6.96	9.2%
Calabria	6.97	8.1%
Sicilia	6.79	28.7%
Sardegna	6.95	7.9%
Total	6.97	15.4%

Table 3. Direct effect of urbanization on overall happiness and domains



	Overall	Economic conditions	Health	Job satisfaction	Environ.	Family relations	Friends	Spare time
Year	-0.024 0.001	*** -0.026 0.001	** -0.001 0.001	* -0.003 0.001	*** 0.000 0.001	-0.001 0.001	* -0.002 0.001	*** -0.003 0.001
<b>Demographics (yes=1, no=0)</b>								
Male	0.010 0.001	*** 0.000 0.002	0.031 0.001	*** 0.020 0.001	*** 0.000 0.002	0.002 0.001	** 0.023 0.001	*** 0.026 0.002
Age, 25-34	-0.062 0.003	*** -0.089 0.005	*** -0.072 0.003	*** -0.002 0.003	-0.010 0.004	*** -0.018 0.003	*** -0.054 0.003	*** -0.079 0.004
Age, 35-44	-0.092 0.004	*** -0.088 0.005	*** -0.120 0.003	*** 0.001 0.003	-0.020 0.004	*** -0.045 0.003	*** -0.089 0.003	*** -0.121 0.004
Age, 45-54	-0.109 0.004	*** -0.097 0.005	*** -0.163 0.004	*** -0.005 0.003	* -0.034 0.004	*** -0.071 0.003	*** -0.114 0.004	*** -0.132 0.004
Age, 55+	-0.127 0.004	*** -0.097 0.005	*** -0.239 0.004	*** -0.010 0.003	*** -0.026 0.004	*** -0.073 0.003	*** -0.146 0.004	*** -0.126 0.005
Children: 0-17y	0.015 0.002	*** -0.014 0.003	*** 0.024 0.002	*** 0.000 0.002	-0.007 0.002	*** 0.006 0.002	*** -0.005 0.002	*** -0.037 0.002
Children: 18+y	-0.007 0.002	*** -0.028 0.002	*** 0.009 0.002	*** -0.007 0.001	*** -0.018 0.002	*** 0.001 0.001	*** -0.002 0.002	*** -0.015 0.002
Separated/divorced	-0.042 0.002	*** -0.022 0.003	*** 0.000 0.002	0.001 0.001	-0.008 0.003	*** -0.052 0.002	*** -0.002 0.002	*** 0.020 0.003
Widowed	-0.053 0.003	*** -0.078 0.004	*** 0.009 0.003	*** -0.004 0.002	* -0.009 0.003	*** -0.101 0.002	*** -0.017 0.003	*** -0.018 0.003
Higher education	0.054 0.002	*** 0.135 0.003	*** 0.053 0.002	*** 0.050 0.002	*** 0.004 0.002	0.026 0.002	*** 0.036 0.002	*** 0.027 0.003
<b>Economic (yes=1, no=0)</b>								
Unemployed	-0.071 0.003	*** -0.215 0.004	*** 0.058 0.003	*** -0.009 0.002	*** -0.013 0.003	*** -0.012 0.003	*** 0.005 0.003	*** 0.014 0.004
Retired	0.054 0.003	*** 0.079 0.004	*** 0.045 0.003	*** -0.010 0.002	*** 0.021 0.003	*** 0.018 0.002	*** 0.034 0.003	*** 0.076 0.004
JobSatRespondents	-0.052 0.002	*** -0.056 0.003	*** -0.102 0.002	*** -0.992 0.002	*** -0.010 0.003	*** -0.012 0.002	*** -0.034 0.002	*** 0.018 0.003
<b>Intercept</b>								
Constant	50.348 1.286	*** 52.945 1.730	*** 3.316 1.258	*** 6.365 1.052	*** 1.661 1.430	*** 3.060 1.045	*** 5.339 1.256	*** 7.630 1.561
Urbanization	-0.019 0.002	*** -0.021 0.002	*** -0.004 0.002	** -0.017 0.001	*** -0.108 0.002	*** -0.014 0.001	*** -0.023 0.002	*** -0.001 0.002
<b>Var</b>								
Var(residual)	0.0746 0.0003	*** 0.1366 0.0005	*** 0.0721 0.0003	*** 0.0515 0.0002	*** 0.0934 0.0003	*** 0.0498 0.0002	*** 0.0718 0.0003	*** 0.1109 0.0004
Var(constant)	0.0006 0.0002	*** 0.0029 0.0009	*** 0.0009 0.0003	*** 0.0005 0.0002	*** 0.0037 0.0012	*** 0.0004 0.0001	*** 0.0006 0.0002	*** 0.0014 0.0005

Table 4. The Happiness function estimates

Year	-0.019	***	<b>Satisfaction domains (regional mean variables)</b>		<b>Variances (by region)</b>		
	0.001		Sateconomic	-0.092	Residual	0.0577 ***	
<b>Demographics (yes=1, no=0)</b>				0.210		0.0002	
Male	-0.002	***	Sathealth	0.501	**	Constant	0.0000 ***
	0.001			0.219			0.0000
Age, 25-34	-0.024	***	Satfamily	-0.848	**	Sateconomic	0.0001 **
	0.003			0.365			0.0001
Age, 35-44	-0.038	***	Satfriends	1.001	**	Sathealth	0.0005 ***
	0.003			0.456			0.0002
Age, 45-54	-0.038	***	Satspare	0.329		Satfamily	0.0007 ***
	0.003			0.280			0.0003
Age, 55+	-0.040	***	Satenv	0.102		Satfriends	0.0009 ***
	0.003			0.073			0.0003
Children: 0-17y	0.016	***	Satjob	-0.128		Satspare	0.0003 ***
	0.002			0.540			0.0001
Children: 18+y	-0.002	*	<b>Mediating role of urbanization</b>			Satenv	0.0002 ***
	0.001		Sateconomic	0.015	***		0.0001
Separated/divorced	-0.032	***		0.004		Satjob	0.0003 **
	0.002		Sathealth	-0.016	***		0.0002
Widowed	-0.027	***		0.005		<b>Statistics and test</b>	
	0.003		Satfamily	0.020	***	LL	953.9923
Higher education	0.010	***		0.006		LR1	465.58 ***
	0.002		Satfriends	-0.014	**	LR2	1907.985 ***
<b>Economic (yes=1, no=0)</b>				0.006		ICC	0.001
Unemployed	-0.047	***	Satspare	-0.003		Endogeneity test: level 1	0.22
	0.003			0.005		Endogeneity test: level 2	-99.91
Retired	0.026	***	Satenv	-0.009	**		
	0.003			0.005			
JobSatRespondents	-0.032	***	Satjob	0.001			
	0.003			0.002			
<b>Satisfaction domains (centered variables)</b>			<b>Intercept</b>				
Sateconomic	0.137	***	Constant	39.545	***		
	0.004			1.163			
Sathealth	0.204	***					
	0.007						
Satfamily	0.135	***					
	0.008						
Satfriends	0.073	***					
	0.008						
Satspare	0.088	***					
	0.005						
Satenv	0.035	***					
	0.005						
Satjob	0.138	***					
	0.005						