



# 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 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 the mediating role, we find that the importance of satisfaction family explains more overall happiness in urban areas. On the contrary, satisfaction with health, friendships and environment gain more weight in rural areas.

## KEYWORDS

happiness function, multilevel models, regions, subjective well-being, urbanization

## JEL CLASSIFICATION

I31, R10

## 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

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consequences of urbanization, among both academics and urban planners. A rich stream of empirical contributions has investigated how the degree of urbanization affects subjective well-being.

Within this literature, an empirical regularity outlines a negative relationship between the level of urbanization and happiness.<sup>1</sup> 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 (Campbell et al., 1976). In fact, subjective well-being is a multidimensional concept, which encompasses happiness in the different aspects of life. 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.

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.

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 analysed using a proper specification of the happiness function (Blanchflower & Oswald, 2004). 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 consider 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 for the years 2010–2013. Ever since the 1980s, almost the 70% of the Italian population lived in cities, by which time the flow of migration from rural areas ceased (Malanima, 2005). For 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>2</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: 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 several 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.

<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.

<sup>2</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 (2002) distinguish three types of economic variables as possible determinants: individual, macroeconomic, and institutional variables. Originally, the main macroeconomic variables analysed were GDP (Brzezinski, 2019; Clark et al., 2008; Easterlin, 1974, 1995, 2009; Easterlin & Plagnol, 2008; Powdthavee et al., 2017, among others), unemployment and inflation (Di Tella et al., 2001) and inequality (Alesina et al., 2004). However, in 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. Over these lines, Dolan et al. (2008) survey the factors associated to happiness, among which urbanization.

In earlier 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 1991. They find that happiness decreases with urbanization. Peiró (2006) exploit data of 15 countries to analyse 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 and Seifert (2003) and Hayo (2007) analyse 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 Lelkes (2006) in Hungary, and Kalyuzhnova and Kambhampati (2008) in Kazakhstan, reporting not significance of urbanization. Other 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 Maslauskaite (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 analyses 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>3</sup> Finally, Lenzi and Perrucca (2021) investigate the effects of the proximity of rural areas to cities of different sizes. They find that proximity to large cities helps in explaining the well-being of residents in rural areas.<sup>4</sup> 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 on 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, and diseconomies 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.

<sup>3</sup>Easterlin et al. (2011), Berry and Okulicz-Kozaryn (2009, 2011) and Shucksmith et al. (2009) report similar findings.

<sup>4</sup>Another relevant contribution who analyses the link between urbanization and happiness is Glaeser (2020). Compared to this literature, though, this analysis focuses on how urbanization relates to objective measures of well-being, such as wage.



From a methodological point of view, we exploit a multilevel model to consider 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 & Corrado, 2012; Oswald & 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 analyse 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.

Finally, the paper is related to the literature that links happiness to geographical and environmental aspect. See, among others, Van Praag and Baarsma (2005), Rehdanz and Maddison (2008), Luechinger (2009), Ferreira and Moro (2010), Levinson (2012), Goetzke and Rave (2015), Glaeser et al. (2016), and Goetzke and Islam (2017).

### 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.<sup>5</sup> The survey provides information on citizens' habits and everyday aspects of life. In the questionnaires, the thematic areas dwell on different social aspects, allowing us 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). We add a measure of health based on a dummy that indicates whether the respondent is affected by a long-term disease. Unfortunately, the HADL does not provide any information about 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).

#### 3.1 | Measure of urbanization

The HADL considers information of the population size of the council of residence. It is categorized in five 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 centres of metropolitan areas. In the literature, there is not a general consensus for the definition of rural/urban.<sup>6</sup> Given the information available, the most natural choice seems to appoint as “urban” the metropolitan areas together with urban suburbs (values “5” and “6”). We will however consider the alternative measure of “city centres” (value “6”) as a cut-off.

<sup>5</sup>Since 2014, the measure of the council size was modified, preventing the extension of the period of analysis.

<sup>6</sup>See, among others, Shucksmith et al. (2009), Knight and Gunatilaka (2010), Kalyuzhnova and Kambhampati (2008), Kyttä et al. (2016), each of which exploit a different measure.



An important aspect that is not included in our analysis is the remoteness of rural areas from metropolitan areas: the degree of proximity to a city might positively affect life satisfaction (Lenzi & Perrucca, 2016). Unfortunately, the information on urbanization available on the HADL prevents to control for it.

**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	
Higher education	152,184	0.124	0.330	0	1	Education: higher than high school
Long-term disease	147,774	0.272	0.445	0	1	
<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	
<b>Specific satisfaction (fully satisfied = 4, not at all = 1)</b>						
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	
<b>Urbanization (yes = 1, no = 0)</b>						
Metropolitan areas	152,184	0.196	0.397	0	1	Metropolitan city centres and suburbs
Metropolitan city centres	152,184	0.109	0.312	0	1	

### 3.2 | Measures of satisfaction

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, asking the same question for each life domain, but using a four-point Likert scale: satisfaction with economic conditions, health, relationship with family and friends, spare time, environment, and job.

### 3.3 | Descriptive analysis

Detailed information on variables and descriptive statistics are illustrated in Table 1. 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. Satisfaction for the economic condition obtain the lowest score of the satisfaction ranking.

**TABLE 2** Happiness across Italian regions

	Happiness	Percentage of councils by region in metropolitan areas
Abruzzo	7.02	0.0
Basilicata	6.96	0.
Bolzano/Trento	7.63	0.0%
Calabria	6.97	24.0
Campania	6.58	16.
Emilia-Romagna	7.06	16.8%
Friuli-Venezia Giulia	7.10	0.0
Lazio	6.83	32.0
Liguria	7.12	28.6
Lombardia	7.15	8.8
Marche	7.07	0.0
Molise	7.00	0.0
Piemonte	7.06	26.4
Puglia	6.82	16.0
Sardegna	6.95	4.5
Sicilia	6.79	63.6
Toscana	6.99	15.0
Umbria	6.99	0.0
Valle d'Aosta	7.17	0.0
Veneto	7.07	7.8
Total	6.97	16.0



### 3.4 | Urbanization and regional differences

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 of metropolitan areas. 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.

## 4 | RESEARCH METHOD

In this section we describe the methodology adopted for 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.

### 4.1 | 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:

$$O = f(\text{Urb}), \quad (1)$$

where  $O \in \{DS_a, H\}$  denotes the domains' satisfaction 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:

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

where  $\text{Urb}$  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:

$$\ln O = \gamma = \alpha_0 + \alpha_z Z + \alpha_u \text{Urb} + \nu, \quad (3)$$

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 us 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:

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



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 may suggest that urbanization has a mediating role in the composition of the happiness function.

## 4.2 | The happiness function

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

$$H = f(DS_1, \dots, DS_A). \quad (5)$$

Following Bernini and Tampieri (2019), 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  $\ln DS_a$  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:

$$\ln H = \gamma = \beta_0 + \beta_a \ln DS_a + \beta_z Z + \beta_u Urb. \quad (7)$$

In Equation 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.

## 4.3 | 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:

$$\begin{aligned} \gamma_{ij} &= \beta_{0j} + \beta_{1j} \ln DS_{ij} + \beta_{2j} Z_{ij} + \varepsilon_{ij}, & \varepsilon_{ij} &\sim N(0, \sigma_\varepsilon^2), & \text{Level 1} \\ \beta_{0j} &= \gamma_{00} + u_{0j}, & u_{0j} &\sim N(0, \sigma_{u0}^2), & \text{Level 2} \\ \beta_{1j} &= \gamma_{10} + \gamma_{11} Urb_{ij} + u_{1j}, & u_{1j} &\sim N(0, \sigma_{u1}^2). & \end{aligned} \quad (8)$$





Notice that equation  $\beta_{1j}$  states that the relationship, as expressed by the slope coefficient between the overall satisfaction and the domains satisfaction, depends on the individual-level urbanization. If  $\gamma_{11}$  is positive, the life domain effect on overall happiness is larger with urbanization; if  $\gamma_{11}$  is negative, the life domain has a lower impact on happiness with urbanization.

#### 4.4 | Methodological issues

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-centred Level-1 covariates as instrumental variables (Hox, 2010; Snijders & Berkhof, 2008). Second, the use of repeated cross-sectional data at different levels of aggregation may cause problems of endogeneity (Aslam & 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:

$$\begin{aligned} y_{ij} &= \beta_{0j} + \beta_{1j}(DS_{ij} - \overline{DS_j}) + \beta_2 Z_{ij} + \varepsilon_{ij}, \quad \varepsilon_{ij} \sim N(0, \sigma_\varepsilon^2), & \text{Level 1} \\ \beta_{0j} &= \gamma_{00} + \beta_{10j}\overline{DS_j} + u_{0j}, \quad u_{0j} \sim N(0, \sigma_{u0}^2), & \text{Level 2} \\ \beta_{1j} &= \gamma_{10} + \gamma_{11}Urb_{ij} + u_{1j}, \quad u_{1j} \sim N(0, \sigma_{u1}^2), & \end{aligned} \quad (9)$$

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 analyse 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 endogeneity problems. At Level 1, we employ Van Praag et al.'s (2003) methodology within a linear model approach, and we extend it to the MLM framework (Bernini & Tampieri, 2019).<sup>7</sup> 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.

## 5 | 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.

<sup>7</sup>We briefly describe the main steps. First, we employ the estimation of the direct effects for each satisfaction domain of a set of socio-economic covariates. 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.



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
Demographics (yes = 1, no = 0)								
Male	0.007*** 0.001	-0.002 0.002	0.022*** 0.001	0.020*** 0.001	0.000 0.002	0.002 0.001	0.021*** 0.001	0.023*** 0.002
Age, 25-34	-0.057*** 0.003	-0.084*** 0.005	-0.056*** 0.003	0.001 0.003	-0.007** 0.004	-0.017*** 0.003	-0.051*** 0.003	-0.075*** 0.004
Age, 35-44	-0.082*** 0.004	-0.079*** 0.005	-0.089*** 0.003	0.005 0.003	-0.016*** 0.004	-0.043*** 0.003	-0.081*** 0.003	-0.111*** 0.004
Age, 45-54	-0.091*** 0.004	-0.081*** 0.005	-0.108*** 0.003	0.000 0.003	-0.027*** 0.004	-0.066*** 0.003	-0.100*** 0.004	-0.116*** 0.004
Age, 55+	-0.096*** 0.004	-0.068*** 0.005	-0.146*** 0.004	-0.001 0.003	-0.014*** 0.004	-0.065*** 0.003	-0.124*** 0.004	-0.099*** 0.005
Children: 0-17y	0.012*** 0.002	-0.017*** 0.003	0.015*** 0.002	-0.002 0.002	-0.009*** 0.002	0.005*** 0.002	-0.007*** 0.002	-0.040*** 0.002
Children: 18 + y	-0.009*** 0.002	-0.030*** 0.002	0.003*** 0.001	-0.008*** 0.001	-0.018*** 0.002	0.001 0.001	-0.003** 0.002	-0.017*** 0.002
Separated/divorced	-0.042*** 0.002	-0.023*** 0.004	-0.003 0.002	0.000 0.002	-0.007*** 0.003	-0.052*** 0.002	-0.002 0.002	0.019*** 0.003
Widowed	-0.057*** 0.003	-0.080*** 0.004	0.001 0.003	-0.005*** 0.002	-0.012*** 0.003	-0.102*** 0.002	-0.019*** 0.003	-0.020*** 0.003
Higher education	0.051*** 0.002	0.134*** 0.003	0.048*** 0.002	0.049*** 0.002	0.003 0.002	0.025*** 0.002	0.034*** 0.002	0.028 0.003
Long term disease	-0.088*** 0.002	-0.077*** 0.002	-0.258*** 0.002	-0.021*** 0.002	-0.031*** 0.002	-0.021*** 0.001	-0.058*** 0.002	-0.074*** 0.002



TABLE 3 (Continued)

	Overall	Economic conditions	Health	Job satisfaction	Environ.	Family relations	Friends	Spare time
<b>Economic (yes = 1, no = 0)</b>								
Unemployed	-0.078*** 0.003	-0.222*** 0.004	0.035*** 0.003	-0.012*** 0.003	-0.016*** 0.003	-0.014*** 0.003	-0.001 0.003	0.008*** 0.004
Retired	0.055*** 0.003	0.080*** 0.004	0.047*** 0.003	-0.010*** 0.002	0.022*** 0.003	0.019*** 0.002	0.034*** 0.003	0.076*** 0.004
JobSatRespondents	-0.043*** 0.002	-0.048*** 0.003	-0.072*** 0.002	-0.987*** 0.002	-0.007*** 0.003	-0.009*** 0.002	-0.027*** 0.002	0.027*** 0.003
<b>Urbanization</b>								
Urbanization	-0.025*** 0.002	-0.033*** 0.003	-0.004*** 0.002	-0.021*** 0.002	-0.121*** 0.002	-0.007*** 0.001	-0.031*** 0.002	-0.027*** 0.002
<b>Intercept</b>								
Constant	50.273*** 1.2850	53.265*** 1.7370	2.964*** 1.1655	6.848*** 1.0730	1.733 1.4450	3.376*** 1.0530	5.417*** 1.2590	7.481*** 1.5660
<b>Var</b>								
Var (residual)	0.0731*** 0.0003	0.1353*** 0.0005	0.0609*** 0.0002	0.0520*** 0.0002	0.0937*** 0.0003	0.0497*** 0.0002	0.0711*** 0.0003	0.1097*** 0.0004
Var (constant)	0.0006*** 0.0002	0.0029*** 0.0009	0.0009*** 0.0003	0.0005*** 0.0002	0.0035*** 0.0011	0.0004*** 0.0001	0.0006*** 0.0002	0.0014*** 0.0004

**TABLE 4** The mediating role of urbanization

Year	−0.019***
	0.001
<b>Demographics (yes = 1, no = 0)</b>	
Male	−0.002***
	0.001
Age, 25–34	−0.024***
	0.003
Age, 35–44	−0.037***
	0.003
Age, 45–54	−0.037***
	0.003
Age, 55+	−0.036***
	0.003
Children: 0–17y	0.016***
	0.002
Children: 18 + y	−0.003*
	0.001
Separated/divorced	−0.032***
	0.002
Widowed	−0.028***
	0.003
Higher education	0.010***
	0.002
Health	−0.015***
	0.002
<b>Economic (yes = 1, no = 0)</b>	
Unemployed	−0.047***
	0.003
Retired	0.027***
	0.003
JobSatRespondents	−0.032***
	0.002
<b>Satisfaction domains (centered variables)</b>	
Sateconomic	0.148***
	0.003
Sathealth	0.188***
	0.006
Satfamily	0.143***
	0.006
Satfriends	0.067***
	0.007



TABLE 4 (Continued)

Satspare	0.087*** 0.004
Satenv	0.032*** 0.004
Satjob	0.138*** 0.005
Satisfaction domains (regional mean variables)	
Sateconomic	−0.028 0.218
Sathealth	0.461*** 0.228
Satfamily	−0.884*** 0.380
Satfriends	1.100*** 0.475
Satspare	0.330 0.292
Satenv	0.081 0.076
Satjob	−0.211 0.562
Mediating role of urbanization	
Sateconomic	−0.002 0.005
Sathealth	−0.019*** 0.006
Satfamily	0.036*** 0.007
Satfriends	−0.016*** 0.007
Satspare	−0.005 0.006
Satenv	−0.013*** 0.005
Satjob	0.003 0.003
Intercept	
Constant	39.447*** 1.172
Variances (by region)	

(Continues)

**TABLE 4** (Continued)

Residual	0.0576*** 0.0002
Constant	0.0001*** 0.0000
Sateconomic	0.0001** 0.0000
Sathealth	0.0005*** 0.0002
Satfamily	0.0006*** 0.0002
Satfriends	0.0009*** 0.0003
Satspare	0.0002*** 0.0001
Satenv	0.0002*** 0.0001
Satjob	0.0003** 0.0002
<b>Statistics and test</b>	
LL	1120.7179
LR1	433.510***
LR2	46.778***
ICC	0.001
Endogeneity test: level 1	0.01
Endogeneity test: level 2	−118.35

In addition, our results show that urbanization is negatively related with each happiness domain. 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 and family relationships; economic conditions, spare time 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.

Table 4 shows the estimation of the happiness function. The model satisfies both LR<sub>1</sub>, LR<sub>2</sub> and ICC, implying the robustness of our estimates. We accept the null of non-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 a job, while it decreases with age, being separated, divorced or widowed, and having children.



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. Also, satisfaction with family has a high impact on overall satisfaction. Finally, the responses of happiness to leisure time and friendships is lower; satisfaction with respect to the 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 & Sawangfa, 2007).

Next, we evaluate the presence of the mediating role of urbanization. The estimated coefficient of urbanization appears to be significant for many domains, namely, health, family, friendship and environment. For all these domains, the coefficient is negatively related to urbanization: different domains contribute differently to overall satisfaction in urban areas compared with rural ones. In other words, urbanization has contrasting effects on overall happiness when combined with the different life domains, confirming the existence of a mediating role of urbanization.

This result must be interpreted as follows. People living in rural areas give a higher relative importance to satisfaction spheres related to health, friendship, and environment than those living in urban areas. By contrast, people living in metropolitan areas give a relatively higher weight to family to determine their overall happiness.

Our analysis does not tell us, though, the origin of these differences. It might be due to different mentalities, cultural attitudes, or habits.

It follows that the different weights of happiness domains in rural and urban areas are not necessarily associated with different opportunities available in these environments. Thus, for instance, urbanization has well-known negative effects on environment (Newman, 2006, among others) and, at the same time, individuals living outside cities give a higher weight to environment to explain their overall satisfaction. But, while one should expect that larger and better equipped hospitals are available in cities, still satisfaction with health exhibits a higher importance to explain overall satisfaction for those living outside of metropolitan areas. Moreover, while it is widely accepted that the traditional family has suffered the increase of urbanization, family relations gain importance at explaining happiness with urbanization.

**TABLE 5** Mediating role of urbanization by metropolitan levels

	Metropolitan city centres	Metropolitan areas
Sateconomic	−0.003	−0.002
	0.006	0.005
Sathealth	−0.020***	−0.019***
	0.008	0.006
Satfamily	0.065***	0.036***
	0.008	0.007
Satfriends	−0.014**	−0.016***
	0.009	0.007
Satspare	−0.021***	−0.005
	0.007	0.006
Satenv	−0.030***	−0.013***
	0.006	0.005
Satjob	0.001	0.003
	0.004	0.003



To conclude, the adoption of a MLM allows us 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 significant. Then, unexplained regional-level variability of the estimated life satisfaction is still present, indicating that other local economic and social aspects, 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 composition of happiness across Italian regions. These findings reflect the natural, social and economic varieties of the Italian territory.

As a robustness check, we also estimate the model by using the alternative measure of urbanization, "metropolitan city centres." For the sake of brevity, Table 5 shows only the estimations related to the mediating role of urbanization and compares them with those obtained with the baseline analysis (metropolitan areas). Results are similar in terms of parameter signs, with the exception of the satisfaction with friends, which becomes significant. Notice that the impact of the environment on individual well-being strongly decreases by considering a more stringent measure of urbanization, while the family relations becomes more relevant.

## 6 | 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. A negative and significant relationship emerged, not only between urbanization and overall happiness, but also between urbanization and each of the happiness domains available. This is consistent with many results in the literature in different countries and time periods.

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. The evidence of the mediating role of urbanization is thus the main novelty of this paper compared to the existing literature.

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 impacts citizens' happiness differently, suggesting that policy plans will differ according to these differences. Being aware of these trade-offs may help redesigning better urban policies.

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