Happiness and the multidimensional nature of well-being

Preliminary version

Antonella Ferrara, Rosetta Lombardo and Rosanna Nisticò

Dipartimento di Economia, Statistica e Finanza - Università della Calabria

87036 Arcavacata di Rende (CS)

[Abstract] *In recent years happiness measures have attracted much attention. The focus of this literature is largely on the dependence of happiness on income issues. There is a lively debate, however, about the relevance of non-income factors on individual satisfaction, as income is only one dimension of well-being. This paper aims to evaluate the dependence of happiness on well-being, considered as a multidimensional phenomenon beyond its economic feature. We construct a synthetic Regional Indicator of well-being (RWBI) based on ten domains - culture and free time; education; employment; environment; essential public services; health; material living conditions; personal security; research and innovation; and the strength of social relations - and calculated combining a set of 57 variables by means of the principal component analysis. With regard to the variable representing happiness, the data source is the Survey of Household Income and Wealth (SHIW). Our analysis is conducted for each Italian region over a two years interval period from 2004 to 2010, thus we use four waves of the SHIW survey. We assess the impact of well-being on individual happiness using a longitudinal ordered logistic regression.*

1. Introduction

Studies on happiness have risen to prominence in recent years among economists, especially since the seminal contribution of Easterlin (1974, 1995) on the happiness-income paradox: at a point in time happiness varies directly with income, but over time happiness does not increase when a country's income increases (Easterlin and Angelescu 2009). Moreover, scholars have widely agreed that considering exclusively economic growth issues may led to a too narrow-sighted perspective of human well-being changes (Decanq and Schokkaert 2015).

Actually, the circumstance that people care about a number of other aspects of life conditions, such as the environment in which they live, their health, the quality of essential public services, their employment, social relations and personal security, could have some implications on subjective life satisfaction.

Recently, the quest of measurement of well-being beyond its economic and productive features has gained an increasing interest both in academic research and in policy debate. A great impulse in this field has been provided by the publication of the Report of the "Commission on the Measurement of Economic Performance and Social Progress" chaired by J. Stiglitz, A. Sen, J. P. Fitoussi (Stiglitz et al. 2009), but also by a number of initiatives promoted by international organizations. The most popular example is the UNDP programme which, since the beginning of the Nineties, has been carrying out the pioneering work of calculating a Human Development Index (HDI). The OECD, starting from 2011, provides a bi-annual assessment of well-being in member countries and in selected emerging economies (OECD 2013). The European Union organized a number of international conferences with the aim of going "beyond GDP" in order to construct well-being indicators, on the assumption that environmental protection, biodiversity and social cohesion are essential factors for progress; since 2011 the European Statistical System Committee (ESSC) has been working towards developing a set of Quality of Life indicators for EU countries.

At the same time, many countries have intensified their efforts to produce statistics for measuring well-being[1]. In Italy, a recent project carried on by the Italian National Institute of Statistics (ISTAT) in conjunction with the National Council for Economy and Labour (CNEL) has given rise to a data base covering 12 dimensions of "Equitable and Sustainable Well-Being" (whose Italian acronym, used hereafter, is BES) consisting of a set of 134 outcome indicators[2]. ISTAT and CNEL also provide a report in which well-being in Italy is examined from a multi-dimensional perspective in the spirit of the recommendations of the "Stiglitz Commission", with each chapter focusing on one specific issue. The BES report, however, does not attempt the final step of aggregating the data into a synthetic measure of well-being, so far.

In the academic world, various approaches to the measurement of well-being exist. Fleurbaey (2009) proposes a critical review of the literature grouping works on the subject into four different approaches: works aimed at obtaining a "corrected GDP" in order to take into consideration sustainability and nonmarket factors which influence well-being; the "capability approach" proposed by Sen (1985, 2000) stating that progress does not coincide with the level of

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[1] The French government has commissioned the report of the "Stiglitz Commission"; in the United States, the 2010 Key National Indicators Act prescribes the creation of a system of indicators on well-being; in Canada, the *Canadian index of well-being* considers indicators of social and living conditions of the population; in Ireland the Central Statistics Office measures progress based on 109 indicators; in the Netherlands the Dutch Social and Cultural Planning Office provides the *Living Condition Index*; a task force on "Growth, well-being and quality of life" was launched by the German Parliament in 2010; the United Kingdom began in 2010 the "Measuring National Well-being Programme"; the National Statistical Office of Malta since 2005 carries out a Survey Income and Living Conditions. The European Statistical Systems is encouraging the construction of multidimensional indicators of quality of life in each member state (European Statistical System 2011).

[2] The Bes data-base is available at www.istat.it

opulence of a country, but rather with people's quality of life and freedom of choice (Nussbaum 2000; 2011); the strand of the construction of "synthetic indicators" which, following the path of the UNDP Human Development Index, are based on the weighted average of indicators of different aspects of human well-being[3]; studies on the measurement of happiness and subjective well-being.

Even if there is a strong relation between the multidimensional nature of well-being and the assessment of people's life satisfaction, studies on happiness are still mainly focused on income growth or on considering separately the impact of a single well-being dimension, such as employment, environment, social relations, health.

The most relevant conclusion of papers focused on the effect of income on life satisfaction is that a positive relationship exists between individual earnings and happiness; yet, happiness and economic growth are unrelated, as stated by the Easterlin paradox. In the last years empirical evidence on the happiness-income paradox has received mixed reviews: some research confirm it (Blanchflower and Oswald 2004, Clark, Frijters, and Shields 2008; DiTella and MacCulloch 2008); others do not (Stevenson and Wolfers 2008). Easterlin and Angelescu (2009) find evidence that over the short term, when fluctuations in macroeconomic conditions dominate the relationship, happiness and income are positively related, whereas over the long term, happiness and income are unrelated. Quite recurrent explanations of these relationships are based on the importance that individuals attach to their economic status in society and to their income relative to other people's income. Alongside with this explanation, it was observed that people's satisfaction depends on their capacity to reach the income levels to which they aspire, but as aspirations tend to rise along with current income, subjective well-being could be negatively affected by the level of one's income aspirations. Aspirations may depend either on the income of one's own reference group or on one's own past income. The first case is named positional treadmill, following the tradition that, in economics and sociology, emphasizes the role of social comparisons and social status (Veblen, 1899; Duesenberry, 1949). The second case is named hedonic treadmill, following the insights of adaptation theory (Frederick and Loewenstein, 1999). Adaptation theory assumes that changes in living conditions have a transitory effect on well-being. Neither rising prosperity nor increased difficulty fully affects happiness. As time goes by, people tend to revert to their baseline level of well-being (Blanchflower, 2008). Social comparison theory argues that what matters for an individual's satisfaction is his/her relative position with respect to a selected group of people he/she respects and to whom he/she wants to resemble, the "reference group" (Falk and Knell, 2004; Layard et al., 2010; Ferrer-I Carbonell, 2005; Diener et al., 1993). Therefore, the general

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[3] For a survey on the latter approach see Bandura (2008), Gadrey and Jany-Catrice (2006), Stiglitz *et al.* (2009); Annoni and Weziak-Bialowolska (2012); Costanza *et al.* (2009).

improvement in income levels brought about by economic growth can result in a negligible increase in average subjective life satisfaction because relative gains and losses compensate each other.

Among studies focusing on different well-being dimensions, those regarding the impact of employment status on happiness are numerous. In general is proved that unemployment is a source of unhappiness and dissatisfaction (Clark and Oswald 1994; Di Tella et al., 2001, 2003; Gerlach and Stephan, 1996; Winkelmann and Winkelmann, 1998).

Finally, a large number of studies have focused on the effects of microeconomic conditions on happiness, while controlling for socio-demographic characteristics and factors related to personality. In this strand of empirical studies, it was found that married, healthy and highly educated people are, in general, happier. Happiness tends to increase when people are in the retirement age, even if, the relation between happiness seems to be U-shaped.

 There are few studies into the determinants of happiness with regards to Italy and to the best of our knowledge, this is the first carried out at the regional level and for a period longer than one year. Using the SHIW of the Bank of Italy conducted in the years 2004 and 2006, Scoppa and Ponzo (2008) find results consistent with the other studies on advanced countries: income and wealth are positively related to happiness, while unemployment is negatively related. On the other hand, they find that people living in the South of Italy are less happy than people living in the North, while people living in the big cities are less happy than people living in villages or small towns; moreover, education has a positive influence on happiness, whereas the number of children exerts no significant effect. Ferrante (2009), by using data drawn from the SHIW conducted by the Bank of Italy in 2004, connects people's life satisfaction to a (positive) difference between expected and achieved outcomes and provides an interesting explanation for the negative relationship between life satisfaction and education. According to the author, education could cause regret and hence a decline in life satisfaction, given that education increases an individual's set of aspirations and opportunities. By introducing the concepts of social capital and relational goods and by making use of the 2010 SHIW, Righi (2014) demonstrates the importance of trust, social values and volunteering with regard to happiness and concludes that these variables should always be taken into consideration in this kind of study, together with other factors (income, gender, age, marital status) which are more traditionally related to happiness. Carrieri (2011) explores the effects of general health conditions of a wide social comparison group on happiness by using the Italian Health Conditions survey 2004–2005. He finds that a high incidence of chronic and disability conditions in the reference group negatively affects happiness.

This paper aims to assess whether the regional well-being conditions might affect the individual perceptions of happiness, investigated until now only in terms of GDP impacts and,

moreover, to analyze how happiness levels are related to the individual characteristics. The contributions of the paper to this strand of empirical research can be summed up into two main points. First, we refer to a composite multidimensional well-being indicator proposed by Ferrara and Nisticò (forthcoming), which combines ten different dimension of well-being by means of a two-steps Principal Component Analysis. The composite indicator stem from 57 original variables extracted by the BES database A composite index for each well-being domain is first computed by means of PCA and then these synthetic measures are used as the new variables for the second step of the PCA in order to obtain a well-being indicator for the Italian NUTS 2 regions. The contribution of this paper is both empirical and methodological; on one hand, in fact, this is the first paper which assess the effect of a composite regional well-being measure on individual happiness; on the other hand, to the best of our knowledge, this is the first study applying the longitudinal ordered logistic regression on a panel sample, exploiting the advantage of the panel subsample (259 households) of the SHIW dataset.

We consider four waves of the *SHIW* (2004, 2006, 2008 and 2010) in the analysis of the impact of the RWBI on happiness and three waves (2006, 2008 and 2010) in the analysis of the impact on happiness of individual characteristics.

This paper is structured as follows. Section 2 discusses the data and methodology used. In section 3 the results concerning the synthetic index of well-being, the estimated model specifications and the econometric findings are discussed. Section 4 concludes.

3. Data and methods

In order to assess the effect of multidimensional well-being on individual happiness we construct a composite indicator which combines ten domains of well-being: Culture and free time, Education, Employment, Environment, Essential public services, Health, Material living conditions, Personal Security, Research and innovation, Social relations (table 1).

In selecting these dimensions, we try to reduce arbitrariness to a minimum by taking on board the various insights which stem from the BES project carried out by the Italian Central Statistical Office (ISTAT). This programme has involved in Italy a rich process of consultation of experts, scholars, policy makers, citizens on the essential aspects of progress affecting the quality of life. Compared with the BES report (CNEL-ISTAT 2013) our construction of the composite indicator does not address the dimensions of "subjective well-being"; "politics and institutions", "landscape and cultural heritage" because not enough variables are available at regional level or because, in relation to these areas, data are accessible only for a too short period for the purpose of our analysis. However, in addition to the issues discussed in the BES report, we consider the "culture and free-time" dimension, another key aspect of well-being, on account of the intrinsic effects that culture

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and sport can have in terms of physical and psychological health, individual enjoyment and leisure, but also for the externalities they determine: cultural consumption has been shown to foster civic participation, social capital and social cohesion (Carlisle and Hanlon 2007; Diener 2009; Grossi *et al.* 2012; Peterson 2012)[4].

We then calculate both a synthetic indicator for each well-being dimension and an overall well-being index (RWBI) by means of the Principal Component Analysis in two steps. PCA enables us to eliminate exogenous arbitrariness in weighting variables for building composite indicators. We can also evaluate the internal consistency of the indicators for each well-being dimension by analyzing the structure of correlations between variables and other specific related tests, such as the Measures of Sampling Adequacy and Bartlett test.

As our aim is to obtain a synthetic indicator for each dimension of well-being, we concentrate our attention just on the first principal component, after applying the Kaiser criterion and verifying the share of total variance explained by each component. The principal components are extracted by the variance-covariance matrix, after dividing the original variables by their mean value, in order to eliminate differences in the unit of measurement yet preserving differences in the variability present in each variable.

As a proxy of individual happiness we use the variable "happy" extracted from the SHIW dataset. The SHIW survey is conducted every two years by the Bank of Italy, since 1965, to collect information on the economic behavior of Italian households and to measure income and wealth components. The basic statistical unit is the household, defined as a group of individuals linked by ties of blood, marriage or affection, sharing the same dwelling and pooling all or part of their incomes[5].

In this study we refer to the panel of households available for all the four waves considered. The question about the evaluation of happiness is part of a special section of the SHIW survey and it is only asked to a sub-sample of individuals, i.e. the heads of households. The variable happy refers to the answer of the respondents to the question "Considering every aspect of your life, how happy do you feel?" and ranges from 1 (extremely unhappy) to 10 (extremely happy). Table 2 shows the frequencies of the variable happy for each of its ten possible categories. The modal value of the distribution is 8, whereas the lowest frequency is registered for the category 2 (table 2).

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[4] As a matter of facts, some institutions, such as the Scottish Executive, have proposed to construct a specific index for measuring the benefit of culture and sport on quality of life and well-being (Scottish Executive 2005).

[5] Until 1987 the survey was conducted with time-independent samples (cross sections) of households. Since 1989 part of the sample has comprised households interviewed in previous surveys (panel households) in order to facilitate the analysis of changes in the phenomena being investigated.

In the empirical model we continue to consider happiness in a categorical scale. Our aim is to assess the impact of the above mentioned multidimensional well-being indicator on the subjective individual perception of happiness. Our happiness regression equation has the form:

$$happy_{i,t} = \alpha + \beta_1 RWBI_{i,t} + \varepsilon_{i,t}$$

where i are the panel families of the SHIW survey, t is the year, RWBI is the value of the composite indicator of well-being computed for the region of residence of family i in year t. We consider three waves of the SHIW survey (years 2006, 2008 and 2010) and we estimate equation applying a longitudinal ordered logistic regression, which allows to consider the actual values taken on by the dependent variable as irrelevant, although larger values are assumed to correspond to "higher" outcomes. Furthermore, we use Ordinary Least Square estimation for robustness. Moreover, we investigate the impact of a one-period-lagged well-being indicator, considering that well-being improvements require structural adaptations and might influence the perception of individuals with a delayed effect. *RWBI* index is scaled by min-max standardization:

$$sY_i^t = \frac{(Y^t - Y_{min})}{(Y_{max} - Y_{min})},$$

Where Y^t is the value of the indicator for region i in year t; Y_{min} and Y_{max} are the minimum and the maximum value in the period under consideration, respectively. $sY_{1,}^t$ assumes values between 0 and 1.

In order to investigate the contribution of individual characteristics in determining happiness perception, we regress the variable happy on a vector of individual characteristics and regional dummies. In this case, the happiness regression model is:

$$happy_{i,t} = \alpha + \delta_i X_{i,t} + \varepsilon_{i,t}$$

where $X_{i,t}$ is a vector of individual and contextual characteristics (e.g.: age, gender, family size, marital status, health status, whether employed or unemployed, education, regional dummies and municipality demographical size).

The impact on individual happiness is again assessed using a longitudinal ordered logistic regression and Ordinary Least Square.

4. Results and robustness

We derive the synthetic regional well-being indicator (RWBI) using as variables the values of the indexes obtained by means of the Principal Component Analysis for each individual dimension of well-being considered for the years 2004, 2006, 2008 and 2010. Results show (table 3) that there is a sharp demarcation between the North and the South of the country: every year the first ten

positions are all occupied by Centre-North regions and the last ten by the eight Mezzogiorno regions along with Liguria and Lazio.

The most evident feature of the dynamics of the well-being index over time is the absence of changes at the five top and bottom positions of the rankings. At the beginning of the period 2004-2010, the first five positions are occupied by Valle d'Aosta, Trentino-Alto Adige, Friuli-Venezia Giulia, Emilia Romagna and Veneto and these remains unchanged throughout the whole period. Similarly, the same five regions occupy the bottom five positions at the beginning and at the end of the period. The region that suffers the lack of well-being the most is Campania, which occupies the bottom rank in five years out of seven, whereas the best performance in terms of well-being is observed throughout the whole period in Valle d'Aosta. The final column of table 3 gives, for each region, the absolute variation of the rank between 2004 and 2010. By looking at the position determined according to the changes in the rank of the Italian regions, at the beginning and at the end of the period, we can definitively confirm the relatively marked level of inertia of well-being in Italy, as shown by the long list of regions whose variation in rank is equal to zero. Notwithstanding this prevailing trend, five regions improve their relative position in the ranking, and six regions are worse off. Umbria, which initially occupied the tenth position in the overall well-being ranking, records the highest improvement (of three positions), followed by Basilicata and Marche with two positions onwards and Liguria and Sardegna who move ahead by just one place. Toscana, which was in sixth position in 2004, shows the worst change in terms of its well-being ranking, slipping down by three positions.

Table 4 reports the summary statistics for the variables considered in the happiness regressions. The age of the respondent (head of the household) is expressed in age-classes in years (less than 30, 31-40, 41-50, 51-65, over 65), whereas ncomp is the number of components of the family. The following variables are dummies representing individual characteristics regarding: gender (male and female), marital status (married, unmarried, separated and widowed), education (compulsory education[6], degree, post degree), municipality size (20000, 20000-40000, 40000-500000 and more than 500000 inhabitants), job position (worker, employee, entrepreneur, manager, other self-employed, retired, unemployed), self-reported health status (very good, good, in average, bad, very bad), regional area (North, Centre, South and Islands) and insurance status (yes or no).

The results obtained using a longitudinal ordered logistic estimation with random effects and variance computed by Jackknife (following Bank of Italy suggestion for SHIW data)[7] are

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[6] Compulsory education is equal to 1 for those who get at least the secondary school license, 0 otherwise.

[7] A flexible strategy to estimate sampling variance is required. Among the random group methods, usually adopted to estimate variance within complex surveys, the Jackknife Repeated Replications uses a dropout procedure. In each replication it drops a cluster from a given stratum, appropriately re-weighting the remaining clusters in the same stratum. The check of sensitivity for quadrature approximation is also performed.

reported in table 5. Column 1 shows the effect on happiness due only to our measure of well-being (RWBI) at time t: the coefficient is positive and statistically significant at 1 percent, meaning that an increase in the RWBI is associated with an increase in the probability to be more likely in a higher level of happiness. In column 2 we consider the well-being indicator lagged of one period (year t_{-1}), the impact on happiness is still positive and statistically significant. As a robustness check, we estimate the same models with Ordinary Least Squares and robust standard errors. In these case, we are considering the outcome variable with a cardinal meaning (4 is the double of 2, 2 is the double of 1 and so on), the results obtained with the longitudinal ordered logit are here confirmed: the effect is positive and statistically significant at 1 percent both for RWBI and for the lagged RWBI. From the OLS estimations another feature of the results arises, the magnitude of the impact of a composite well-being indicator on individual happiness perception increases of 1.702 percentage points when considering the indicator lagged of one period. This result confirms that people perception on happiness and well-being are not immediately influenced by well-being conditions but require a "time interval of adaptation".

However, following the literature in this strand of research (Clark and Oswald, 1994, Ferrer-i-Carbonell and Frijters, 2004, Gerdtham and Johannesson, 2001, Rodriguez-Pose and Maslauskaite ,2012, Scoppa and Ponzo 2008, among others), in the second part of the analysis we aim to assess the effect on the level of happiness due to some individual characteristics, on the panel sub-sample selected.

The regression equations are again estimated by applying both the longitudinal ordered logistic estimation and the Ordinary Least Square for robustness (table 6)[8]. First (model 1) we assess the impact of personal not manipulable characteristics on happiness perception (age and gender), then (model 2) we introduce other personal characteristics (number of family components, marital and health status), in model 3 we add a control for the education level of the respondent, whereas the geographical and environmental aspects (area, municipality size and insurance) are included in model 4; model 5 considers in addition the variables relying the job position. In model 1, age has a positive and statistical significant impact on happiness: people older than 30 have a higher probability to be more likely in a higher level of happiness. Traditional surveys of the field, such as Argyle (2001), Diener et al. (1999) and Myers (1992), argue that happiness is either flat or slightly increasing in age. New work, conversely, has shown that there is some evidence of a U-shape through the life cycle. Blanchflower & Oswald (2004) and Ferrer-i-Carbonell, and Gowdy (2007) find a negative relationship between age and subjective well-being and a positive relationship between age squared subjective well-being. In cross-sections, even after correcting for

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[8] We control for multicollinearity using the VIF of the estimations and correlation matrix (reported in Appendix).

potentially confounding influences, a convex link emerges between reported well-being and age. This finding appears in Clark and Oswald (1994), Di Tella, MacCulloch, and Oswald (2001, 2003) and Frey and Stutzer (2002) among others.

We find that females have a lower probability of being in a higher level of happiness. A few studies report no gender differences (e.g. Louis & Zhao, 2002) even using the same datasets. According to Alesina et al. (2004), instead, women tend to report higher happiness. This suggests that other control variables may also be more important than gender per se. Indeed, when subsets are examined, such as those who provide informal care for others (van den Berg & Ferrer-i-Carbonell, 2007), the gender effect often disappears.

Larger families and being separated or widowed are associated with lower probability of being happier, even though only for the first variable the result is statistically significant (model 2 A negative effect of being widowed or separated is reported by Blanchflower and Oswald (2011). Family size, (measured as the number of components) in Cunãdo and Pérez Gracia (2013) is instead found having a positive effect.

Health plays a key role in qualifying happiness[9].A similar result is found in Veenhoven (1991), Hartog and Oosterbeeck (1998) and Alesina et al. (2004).

Model 3 highlights that education has a positive and statistically significant impact on the probability to be in a higher level of happiness only for post-degree titles. Similar result is obtained in Righi (2014). Although some empirical studies find a positive effect of education on happiness (Di Tella et al., 2001; Albert and Davia, 2005), the empirical evidence on the link between these two variables is not conclusive. Some studies find, in fact, a positive relationship between each additional level of education and subjective wellbeing (e.g. Blanchflower and Oswald, 2004), while others find that middle level education is related to the highest life satisfaction (e.g. Stutzer, 2004). Some studies find opposite results after controlling for income: Clark and Oswald (1996) find that more educated individuals register a lower level of satisfaction, while Blanchard and Oswald(2011) find that there are no statistically significant effects from the education variables[10].

Once again the disadvantage due to regional disparities comes out: people living in the South and Islands have a higher probability to be in a lower happy level respect to those living in

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[9] However, as underlined by Rodriguez-pose et al. (2012) the impact of self-reported health status on happiness could suffer of an endogeneity problem

[10] Education qualifications may be related to unobservable traits at the individual level, such as intelligence, family background or motivation and therefore one should control for unobserved heterogeneity. However, fixed effects models can only catch the effect of individuals completing their education or returning to education at a later date and most adult survey respondents are unlikely to change their education level during their time in a panel survey. Therefore fixed effects models are unlikely to find any significant effect for education (e.g. Meier & Stutzer, 2006).

the North (a similar result is found in Scoppa and Ponzo, 2008), whilst the municipality size and the insurance safeguards do not seem to have a significant impact. The inclusion of the job position dummies do not influence individual happiness (model 5)[11], even though, when accounting for jobs, people leaving in medium sized municipality (20000-40000) show a higher probability to be happier than those who live in very big municipalities. The results obtained with longitudinal logistic estimations are consistent with those obtained with OLS. However, in this case all the variables regarding civil status are statistically significant (with a negative impact on happiness for separated and widowed) and positive and statistically significant are the dummies representing the municipality sizes

In Table 8 and in Table 9 we present the results of other estimations conduced to support our hypothesis that in order to assess the determinant of happiness it is important to go beyond GPD.

As it can be seen, the effect of the lagged RWBI is positive and significant both in the longitudinal logit and OLS estimations. Happiness is positively and significantly affected by ages, tertiary education and health but it is not affected by gender.

The effect of GDP on happiness is positive and significant but just when it is considered as the only independent variable. When individual characteristics are added to the model, in fact, the effect of GPD becomes not significant and the sign is inverted. The effect of individual characteristics is confirmed.

4. Concluding remarks

Although the results should be regarded as provisional, the relevance of the present study lies in at least three features. First, it contributes to the scarce empirical literature on the relationship between happiness and well-being in Italy. Second, it differs from other studies, as it considers well-being as a multidimensional phenomenon beyond its economic features and, therefore, it proposes a new multidimensional well-being indicator. The synthetic indicator is built by following a two-step approach of the Principal Component Analysis, i.e., a multivariate technique - to the best of our knowledge - not yet applied to the construction of an overall synthetic indicator of well-being. In the first step, the original variables for all Italian regions, grouped in ten sets, are reduced by PCA to ten synthetic indicators, one for each well-being domain. In the second step, the PCA is applied again in order to extract from the ten synthetic indexes, an overall indicator of well-being (RWBI). Third, the effect of the above mentioned well-being indicator on the self-reported level of happiness is investigated by means of a

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[11] In the literature the evidence to draw clear conclusions about the impact of type of work on happiness is not sufficient.

longitudinal ordered logistic regression. This methodology, diversely from the classical ordered logit, allows us to observe a panel of households over time.

It is, obviously, difficult to compare the results across studies[12], however, when assessing the effects of individual characteristics on subjective well-being, some of the main findings of the literature are confirmed also in this panel scenario. Males over 30 are happier than younger males and happier than females, happiness is reduced in larger families, for less healthy people and in highly populated cities. Scoppa and Ponzo (2008) find a similar result as to regard the size of the town; they find that Italian women and men do not present statistically significant levels of happiness. In other countries, women tend to report higher happiness (Alesina et al., 2004). In our sample lower education does not seem to have a significant impact, whereas it is still confirmed the positive effect on happiness related to tertiary education. Scoppa an Ponzo (2008) find that happiness strongly increase with years of education[13].

An interesting feature arises when considering the geographical dummies: people living in the South have a lower probability to be associated with high happiness levels. This confirms the well-known story about the Italian regional disparities even when the attention moves to the individuals subjective sphere. People living in Southern regions experienced, as it is well-known ,lower productive levels, worse life conditions and, as we find, they feel less happy than individuals living in the North. This results leave still open the challenge of equality among Italian citizens, despite their geographical location[14].

Moving beyond the highly investigated impact of individual determinants on happiness, we tried to assess how individual happiness might be affected by quality of life conditions. Results highlight that an increase in the RWBI is associated with an increase in the probability to be more likely in a higher level of happiness, i.e. the objective well-being conditions positively affect the probability to be happier, both in the longitudinal logit and OLS estimations. However, we argue that well-being improvements are not immediately perceived by the individuals and might require structural changes and longer time intervals to be effective. For this reason, we test the effect on happiness due to a lagged RWBI. The effect is still positive, statistically significant and even more marked.

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[12] Important sources of apparent discrepancy between results arises from the use of different categorization of variables and from the choice of a different reference category. Different findings may also arise due to the inclusion of different control variables (Dolan, 2008).

[13] Some findings of our paper differ from the ones in Scoppa and Ponzo (2008) probably because, while referring to the same country and even using the same data source, we use a panel sample in addition to include different control variables.

[14] Recent studies show, however, important differences, regarding socio-economic conditions not only among Italian regions but within Italian regions and even provinces. Therefore, future research, by descending in the geographical level could make an interesting contribution to this literature.

The results obtained are robust both to the specification of the variables and the methodology applied. Indeed, we estimated the same models both considering the happiness variable with ordinal meaning (longitudinal ordered logistic estimation) and with cardinal meaning (OLS).

There are a number of difficulties in making terse conclusions about the determinants of happiness. It is not possible, in fact, to exclude the influence of omitted variables. Furthermore, results might be tainted by reporting bias. Personality, indeed, may affect the subjective wellbeing perception. However, there is also some agreement on which things are associated with happiness, which have been confirmed referring to different countries, using different data sets and different methods of estimation, therefore happiness studies might help to evaluate the subjective welfare effects of different factors such as health, education, etc.. and might help inferring implications of different public policies.

Table 1 – *Well-being dimensions: indicators, definitions and sources (database subsections in parenthesis)*

	Indicators	Definitions	Source
	Culture and free time		
C1	Newspaper reading	Persons aged 6 and over who read newspapers at least once a week per 100 people with the same characteristics.	i.stat (Culture, leisure and time use)
C2	Theatrical performances	Percentage of persons aged 6 and over who have been to theatrical performances at least once in the last year.	i.stat (Culture, leisure and time use)
C3	Live classical music concerts	Percentage of persons aged 6 and over who have attended classical live music concerts at least once in the last year.	i.stat (Culture, leisure and time use)
C4	Sport events	Percentage of persons aged 6 and over who have attended sport events at least once in the last year.	i.stat (Culture, leisure and time use)
C5	Books reading	Persons aged 6 and over who read books in the previous 12 months per 100 people with the same characteristics.	i.stat (Culture, leisure and time use)
C6	Museums visits	Percentage of persons aged 6 and over who have visited museums at least once in the last year.	i.stat (Culture, leisure and time use)
C7	Sport	Percentage of persons aged 3 and over who practise sports.	i.stat (Culture, leisure and time use)
	Education		
E1	People with tertiary education	Percentage of people aged 30-34 with tertiary education (ISCED 5 or 6).	BES (Education)
E2	Rate of early leavers from education and training	Percentage of people aged 18-24 with only lower secondary school diploma (ISCED 2) and are not enrolled in a training programme.	BES (Education)
E3	Rate of upper secondary school leavers	Total school leavers within the first two years of upper secondary school as a percentage of the students enrolled in the second year of higher secondary school.	ISTAT- DPS (Education)
E4	Participation in life-long learning	Percentage of people aged 25-64 participating in formal or non-formal educational programmes.	BES (Education)
E5	People with at least upper secondary education	Percentage of people aged 25-64 having completed secondary education (ISCED level not below 3a, 3b or 3c).	BES (Education)
	Employment		
L1	Employment rate	Percentage of employed persons aged 20-64.	BES (Work and life balance)
L2	Non-participation rate	Unemployed and potential labour force aged 15-74 (people not searching for a job during the previous 4 weeks but available for work) as percentage of labour force aged 15-74 and potential labour force aged 15-74.	BES (Work and life balance)
L3	Share of employed persons with temporary jobs for at least 5 years	Share of currently employed persons with temporary jobs for at least 5 years.	BES (Work and life balance)
L4	Share of workers in an irregular occupation	Percentage of workers not in compliance with labour, fiscal and pension laws.	BES (Work and life balance)
L5	Ratio between the employment rate of women aged 25-49 with at least one child of compulsory school age (6-13), and the employment rate of women aged 25-49 without children	Employment rate of women aged 25-49 with at least one child under compulsory school age (6-13) divided by the employment rate of women aged 25-49 without children.	BES (Work and life balance)
L6	Ratio of female employment rate to male employment rate	Ratio of female to male employment rate (%).	ISTAT-DPS (Labour)

	Indicators	Definitions	Source
L7	Incidence of long term unemployment	People looking for employment for more than 12 months as percentage of the total of people looking for employment.	ISTAT-DPS (Labour)
L8	Youth unemployment rate	People aged 15-24 looking for employment as percentage of the labour force aged 15-24.	ISTAT-DPS (Labour)
	Environment		
A1	Fertilizers used in agriculture	Simple fertilizers (Nitrogen, Phosphorus, Potassium) used per hectare of Utilized Agriculture Area (in quintals).	ISTAT-DPS (Environment)
A2	Monitoring of air quality	Number of air monitoring stations, per 100.000 inhabitants.	ISTAT-DPS (Cities)
A3	Air pollution	Number of days during which the level of PM10 was higher than the limit of 50 μg/m3 in regional capital cities [(days/365)*100].	BES (Environment)
A4	Energy consumption provided by renewable sources	Electricity produced by renewable sources (GWh) as percentage of electricity internal gross consumption.	BES (Environment)
A5	Special Protection Areas	Percentage of regional land (ha) designed as Special Protection Areas.	ISTAT-DPS (Environment)
A6	Population density	Population per square kilometre of land area.	I.Stat (Population)
	Essential public services		
Q1	Waiting lists for treatments	Individuals who give up the chance to see a specialist or undergo therapeutic treatment (not dental) because of the length of waiting lists as percentage of residents.	BES (Quality of services)
Q2	Differentiated urban waste collection	Percentage of differentiated (recyclable vs non recyclable) urban waste collection out of total urban waste.	BES (Quality of services)
Q3	Child care services	Percentage of children up to age 3 using child-care services - day-care centres, mini day-care facilities or supplementary and innovative services - of which 70% in day-care centres, out of the total population aged up to 3 years.	BES (Quality of services)
Q4	Elderly assisted at home	Percentage of elderly people who benefited from integrated home assistance service (Adi) out of the total elderly population (aged 65 and over).	BES (Quality of services)
Q5	Irregularities in electric power provision	Frequency of accidental long lasting power cuts (cuts without notice longer than 3 minutes), average number per consumer.	BES (Quality of services)
Q6	Irregularities in water supply	Percentage of households who report irregularities in water supply.	BES (Quality of services)
	Gross domestic product		
GDP	Per-capita GDP	Gross domestic product (GDP) at current market prices by NUTS 2 regions, euro per inhabitants.	Eurostat (Regional economic statistics)
	Health		
H1	Life expectancy	Average number of years that a child born in a given calendar year can expect to live if exposed throughout life to the risks of death observed in the same year at different ages.	BES (Health)
H2	Infant mortality rate	Deaths in the first year of life per 10.000 live births.	BES (Health)
H3	Overweight or obesity	Standardized percentage of people aged 18 years and over who are overweight or obese (the indicator refers to the Body Mass Index - BMI).	BES (Health)

	Indicators	Definitions	Source
H4	Sedentary lifestyle	Standardized percentage of people aged 14 years and over who do not practice any physical activity.	BES (Health)
H5	Nutrition	Standardized percentage of people aged 3 years and over who consume at least 4 portions of fruit and vegetables a day.	BES (Health)
Material living conditions			
M1	Disposable household income per inhabitant	Disposable household income on the total number of inhabitants.	ISTAT (Regional economic accounts)
M2	Disposable income inequality	Ratio of total equivalised income received by 20% of the population with the highest income to that received by 20% of the population with the lowest income.	BES (Economic Well-Being)
M3	People at risk of relative poverty	Percentage of persons at risk of poverty, with an equivalised income less than or equal to 60% of the median equivalised income.	BES (Economic Well-Being)
M4	People living in jobless households	Percentage of individuals living in households with at least one component aged 18-59 years (with the exception of households where all members are full time students under 25 years) where nobody works or receives an occupational pension.	BES (Economic Well-Being)
M5	People suffering poor housing conditions	Percentage of people in overcrowded dwellings without basic facilities or with structural defects.	BES (Economic Well-Being)
Personal Security			
T1	Burglary rate	Number of burglaries per 1.000 households.	BES (Security)
T2	Pick-pocketing rate	Number of pick-pocketing per 1.000 people.	BES (security)
T3	Robbery rate	Number of robberies per 1.000 people.	BES (Security)
T4	Homicide rate	Number of homicide per 100.000 people.	BES (Security)
T5	Perception of crime risk	Percentage of households who are very much worried by the crime risk in the area where they live.	ISTAT DPS (Legality and safety)
Research and Innovation			
R1	R&D expenditure	R&D expenditure by Public Administration, Universities and public and private companies as percentage of GDP.	BES (Research and Innovation)
R2	Capacity to export	Percentage of the value of the goods' exports on GDP.	ISTAT-DPS (Internationalization)
R3	Patents	Number of patents registered by the European Patent Office per million inhabitants.	BES-ISTAT - DPS (Research and Innovation)
R4	R&D workers	Researchers, technicians and other personnel involved in R&D in the Public Administrations, University, public and private companies, per 1.000 inhabitants.	ISTAT - DPS (Research and Innovation)
R5	Graduates in Science and Technology	People aged 20-29 with degree in scientific and technological disciplines, per 1.000 inhabitants.	ISTAT - DPS (Research and Innovation)
Social Relations			
S1	Satisfaction with family relations	Share of population aged 14 and over who are very satisfied with their family relationships.	BES (Social relationships)
S2	Satisfaction with friendship relations	Share of population aged 14 and over who are very satisfied with the relationships with friends.	BES (Social relationships)

	Indicators	Definitions	Source
S3	Synthetic indicator of social participation	Based on the aggregation of the following indicators: People aged 14 and over who during the past 12 months have participated in meetings of associations, trade unions or professional associations or in activities, organized or promoted by religious or spiritual groups; have attended meetings of political parties.	BES (Social relationships)
S4	Volunteer work	Percentage of the population aged 14 and over who, in the past 12 months performed, non-paid volunteer work for associations or volunteer groups.	BES (Social relationships)
S5	Share of population who financed associations	Share of population aged 14 and over who in the past 12 months have financed associations.	BES (Social relationships)

Table 2 – Frequencies of happy

HAPPY	Freq.	Percent	Cum.
1	11	1.42	1.42
2	6	0.77	2.19
3	10	1.29	3.47
4	18	2.32	5.79
5	51	6.56	12.36
6	121	15.57	27.93
7	176	22.65	50.58
8	235	30.24	80.82
9	83	10.68	91.51
10	66	8.49	100.00
Total	777	100.00	

Source: Our elaborations on SHIW data

Table 3 – Regional Well-Being Index (RWBI) by region and year

	2004		2006		2008		2010		Δ (2010-2004)	
Position	Regions	Index value	Regions	Index value	Regions	Index value	Regions	Index value	Regions	ks
1	Valle d'Aosta	7,30	Valle d'Aosta	7,27	Valle d'Aosta	5,85	Valle d'Aosta	3,44	Toscana	3
2	Trentino-A.A.	4,43	Trentino-A.A.	3,80	Trentino-A.A.	4,03	Trentino-A.A.	3,30	Molise	2
3	Friuli-V.G.	1,54	Friuli-V.G.	1,76	Friuli-V.G.	1,77	Friuli-V.G.	2,16	Lombardia	1
4	Emilia-Romagna	1,26	Emilia-Romagna	0,81	Emilia-Romagna	0,96	Emilia-Romagna	1,62	Piemonte	1
5	Veneto	1,05	Umbria	0,57	Veneto	0,78	Veneto	1,14	Abruzzo	1
6	Toscana	0,99	Veneto	0,56	Umbria	0,48	Marche	0,86	Lazio	1
7	Lombardia	0,71	Abruzzo	0,47	Lombardia	0,28	Umbria	0,82	Valle d'Aosta	0
8	Marche	0,69	Toscana	0,33	Marche	0,18	Lombardia	0,82	Trentino-A.A.	0
9	Piemonte	0,61	Lombardia	0,28	Toscana	0,17	Toscana	0,59	Friuli-V.G.	0
10	Umbria	0,56	Marche	0,23	Abruzzo	0,14	Piemonte	0,31	Emilia-Romagna	0
11	Abruzzo	0,53	Piemonte	0,14	Piemonte	0,10	Liguria	0,25	Veneto	0
12	Liguria	0,14	Liguria	-0,15	Liguria	-0,30	Abruzzo	0,07	Puglia	0
13	Lazio	-0,72	Basilicata	-0,41	Molise	-0,45	Basilicata	-0,67	Calabria	0
14	Molise	-0,78	Molise	-0,72	Basilicata	-0,54	Lazio	-0,75	Sicilia	0
15	Basilicata	-0,93	Lazio	-1,16	Lazio	-1,18	Sardegna	-1,21	Campania	0
16	Sardegna	-1,26	Sardegna	-1,26	Sardegna	-1,38	Molise	-1,22	Liguria	-1
17	Puglia	-2,34	Puglia	-2,58	Puglia	-2,94	Puglia	-2,95	Sardegna	-1
18	Calabria	-2,53	Calabria	-2,70	Sicilia	-3,43	Calabria	-3,25	Marche	-2
19	Sicilia	-2,97	Sicilia	-2,92	Campania	-3,94	Sicilia	-3,46	Basilicata	-2
20	Campania	-3,09	Campania	-3,67	Calabria	-4,00	Campania	-3,60	Umbria	-3

Source: Our elaborations on BES data

Table 4 Summary Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
happy	777	7.239	1.725	1	10
ncomp	777	2.529	1.198	1	7
less_30y	777	0.00386	0.0621	0	1
31_40y	777	0.0849	0.279	0	1
41_50y	777	0.183	0.387	0	1
51_65y	777	0.355	0.479	0	1
over65y	777	0.373	0.484	0	1
male	777	0.637	0.481	0	1
female	777	0.363	0.481	0	1
married	777	0.696	0.460	0	1
unmarried	777	0.0965	0.296	0	1
separated	777	0.0618	0.241	0	1
widowed	777	0.145	0.353	0	1
compulsory_ed	777	0.698	0.460	0	1
degree	777	0.0721	0.259	0	1
post degree	777	0.00386	0.0621	0	1
inhab20000	777	0.318	0.466	0	1
inhab20000_40000	777	0.241	0.428	0	1
inhab40000_500000	777	0.345	0.476	0	1
inhab over 500000	777	0.0965	0.296	0	1
worker	777	0.161	0.368	0	1
employee	777	0.144	0.351	0	1
manager	777	0.0270	0.162	0	1
entrepreneur	777	0.0412	0.199	0	1
Other self-employed	777	0.0579	0.234	0	1
retired	777	0.499	0.500	0	1
unemployed	777	0.0695	0.254	0	1
heverygood	777	0.178	0.382	0	1
hegood	777	0.535	0.499	0	1
heinaverage	777	0.224	0.417	0	1
hebad	777	0.0502	0.218	0	1
heverybad	777	0.0129	0.113	0	1
areaNorth	777	0.411	0.492	0	1
areaCentre	777	0.420	0.494	0	1
areaSouth	777	0.170	0.376	0	1
insured	777	0.395	0.489	0	1
not_insured	777	0.605	0.489	0	1

Source: Our elaborations on SHIW and BES data

Table 5 The impacts of well-being on happiness

VARIABLES	xtologit happy	xtologit happy	ols happy	ols happy
rwbi	0.223***		0.132***	
	(0.0822)		(0.0382)	
lag_rwbi		4.157***		1.834***
		(0.861)		(0.404)
Constant			7.246***	6.613***
			(0.0615)	(0.154)
Observations	777	777	777	777
R-squared			0.014	0.023
Number of nquest	259	259		

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Our elaborations on SHIW and BES data

Table 6 Determinants of Happiness Level. Longitudinal Ordered Logit Estimations

VARIABLES	(1) happy	(2) happy	(3) happy	(4) happy	(5) happy
31_40y	2.147***	2.792***	2.774***	2.947***	2.709***
	(0.488)	(0.475)	(0.476)	(0.507)	(0.551)
51_65y	1.145***	2.106***	2.154***	2.264***	1.994***
	(0.213)	(0.302)	(0.314)	(0.400)	(0.463)
41_50y	2.042***	2.712***	2.714***	2.883***	2.651***
	(0.235)	(0.288)	(0.286)	(0.392)	(0.437)
over65y	0.940***	2.320***	2.560***	2.662***	2.357***
	(0.225)	(0.346)	(0.392)	(0.456)	(0.541)
female	-0.890***	-0.200	-0.176	-0.181	-0.136
	(0.283)	(0.289)	(0.287)	(0.291)	(0.316)
ncomp		-0.299**	-0.286**	-0.262**	-0.260*
		(0.128)	(0.128)	(0.126)	(0.132)
married		0.930*	0.965**	0.959**	1.072**
		(0.480)	(0.478)	(0.478)	(0.508)
separated		-0.899	-0.904	-0.826	-0.739
		(0.634)	(0.637)	(0.607)	(0.622)
widowed		-0.845	-0.775	-0.740	-0.692
		(0.557)	(0.547)	(0.549)	(0.555)
heverygood		2.005***	1.945***	1.853***	1.862***
		(0.346)	(0.346)	(0.353)	(0.357)
hegood		1.421***	1.364***	1.342***	1.346***
		(0.264)	(0.264)	(0.263)	(0.265)
compulsory_ed			0.457	0.414	0.434
			(0.325)	(0.330)	(0.328)
degree			0.0404	0.215	0.0866
			(0.556)	(0.570)	(0.582)
Post degree			1.477***	1.596***	1.839***
			(0.374)	(0.393)	(0.694)
areaCentre				-0.302	-0.279
				(0.260)	(0.262)
areaSouth				-0.728**	-0.752**
				(0.368)	(0.376)
inhab20000				0.532	0.690
				(0.459)	(0.463)
inhab 20000_40000				0.654	0.857*
				(0.492)	(0.505)
inhab 40000_500000				0.526	0.663
				(0.450)	(0.453)
Insured				0.136	0.0718
				(0.210)	(0.219)
worker					-0.120
					(0.483)
employee					0.548
					(0.522)
manager					0.866
					(0.603)
entrepreneur					0.174
					(0.687)
other self-employed					-0.183
					(0.617)
retired					0.255
					(0.515)
Observations	777	777	777	777	777
Number of nquest	259	259	259	259	259

Standard errors (Jackknife) in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Our elaborations on SHIW and BES data

Table 7 Determinants of Happiness Level. Ordinary Least Square Estimations

VARIABLES	(1) happy	(2) happy	(3) happy	(4) happy	(5) happy
31_40y	1.464*	1.856***	1.845**	1.931***	1.726
	(0.753)	(0.717)	(0.720)	(0.731)	(1.065)
51_65y	0.715	1.411**	1.452**	1.506**	1.248
	(0.730)	(0.702)	(0.708)	(0.721)	(1.058)
41_50y	1.449**	1.860***	1.871***	1.964***	1.776*
	(0.731)	(0.702)	(0.705)	(0.721)	(1.056)
over 65y	0.544	1.638**	1.803**	1.842**	1.487
	(0.731)	(0.709)	(0.717)	(0.729)	(1.072)
female	-0.753***	-0.232*	-0.226*	-0.236*	-0.181
	(0.137)	(0.132)	(0.131)	(0.133)	(0.150)
ncomp		-0.189***	-0.178***	-0.166**	-0.153**
		(0.0670)	(0.0662)	(0.0662)	(0.0683)
married		0.589***	0.595***	0.587***	0.646***
		(0.203)	(0.206)	(0.205)	(0.222)
separated		-0.604*	-0.595*	-0.553*	-0.501
		(0.308)	(0.312)	(0.304)	(0.320)
widowed		-0.536**	-0.546**	-0.532*	-0.514*
		(0.272)	(0.275)	(0.278)	(0.288)
heverygood		1.618***	1.577***	1.494***	1.499***
		(0.187)	(0.186)	(0.192)	(0.194)
hegood		1.206***	1.148***	1.133***	1.121***
		(0.153)	(0.149)	(0.152)	(0.154)
compulsory_ed			0.248	0.236	0.274*
			(0.156)	(0.162)	(0.166)
degree			-0.127	-0.0268	-0.128
			(0.224)	(0.227)	(0.240)
post degree			1.795***	1.731***	1.726***
			(0.366)	(0.390)	(0.471)
areaCentre				-0.158	-0.151
				(0.127)	(0.128)
areaSouth				-0.390**	-0.390**
				(0.168)	(0.175)
inhab20000				0.340*	0.431**
				(0.203)	(0.214)
inhab 20000_40000				0.404*	0.522**
				(0.218)	(0.236)
inhab 40000_500000				0.370*	0.440**
				(0.199)	(0.210)
Insured				0.0219	-0.0210
				(0.120)	(0.123)
worker					-0.0704
					(0.286)
employee					0.424
					(0.280)
manager					0.552
					(0.381)
entrepreneur					0.281
					(0.370)
other self-employed					-0.0508
					(0.361)
retired					0.356
					(0.293)
Constant	6.667***	4.964***	4.720***	4.454***	4.296***
	(0.723)	(0.738)	(0.755)	(0.798)	(1.165)
Observations	777	777	777	777	777
R-squared	0.084	0.239	0.246	0.255	0.265

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Our elaborations on SHIW and BES data

Table 8 The effects of lagged RWBI and Individual Characteristics on Happiness

VARIABLES	(1) xtologit happy	(2) ols happy
lag_RWBI	6.456***	2.166**
	(1.574)	(0.932)
31_40y	2.677***	1.700**
	(0.570)	(0.798)
51_65y	1.967***	1.260
	(0.473)	(0.789)
41_50y	2.597***	1.761**
	(0.449)	(0.786)
over65y	2.290***	1.485*
	(0.550)	(0.808)
female	-0.254	-0.219
	(0.332)	(0.147)
ncomp	-0.236*	-0.142**
	(0.134)	(0.0664)
married	0.902*	0.573***
	(0.538)	(0.219)
separated	-0.867	-0.534*
	(0.661)	(0.309)
widowed	-0.862	-0.554*
	(0.603)	(0.285)
heverygood	1.916***	1.517***
	(0.366)	(0.189)
hegood	1.348***	1.120***
	(0.270)	(0.151)
compulsory_ed	0.365	0.245
	(0.332)	(0.161)
degree	0.0970	-0.135
	(0.653)	(0.237)
post degree	1.591*	1.764***
	(0.840)	(0.450)
areaCentre	0.126	-0.0154
	(0.287)	(0.135)
areaSouth	1.566**	0.390
	(0.689)	(0.390)
ihab20000	0.0866	0.218
	(0.497)	(0.229)
inhab20000_40000	0.192	0.285
	(0.564)	(0.262)
inhab40000_500000	0.235	0.288
	(0.491)	(0.223)
insured	0.0185	-0.0432
	(0.222)	(0.121)
worker	-0.143	-0.0770
	(0.488)	(0.278)
employee	0.437	0.379
	(0.532)	(0.273)
manager	0.851	0.537
	(0.612)	(0.364)
entrepreneur	0.0954	0.246
	(0.696)	(0.355)
other self-employed	-0.281	-0.0586
	(0.636)	(0.350)
retired	0.137	0.317
	(0.523)	(0.283)
Constant	yes	yes
R-squared		0.270
Number of nquest	259	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9 The effect of GDP and Individual Characteristics on Happiness

VARIABLES	(1) xtologit happy	(2) ols happy	(3) xtologit happy	(4) ols happy
standardised_pc_GDP	0.769*	0.677***	-1.374	-0.119
	(0.465)	(0.206)	(1.112)	(0.537)
31_40y			2.801***	1.733**
			(0.566)	(0.749)
51_65y			2.092***	1.259*
			(0.468)	(0.738)
41_50y			2.737***	1.783**
			(0.448)	(0.736)
over65y			2.450***	1.498**
			(0.544)	(0.758)
female			-0.191	-0.186
			(0.328)	(0.148)
ncomp			-0.276**	-0.155**
			(0.132)	(0.0665)
married			1.029**	0.641***
			(0.517)	(0.217)
separated			-0.748	-0.501
			(0.628)	(0.309)
widowed			-0.717	-0.516*
			(0.567)	(0.282)
heverygood			1.892***	1.504***
			(0.359)	(0.191)
hegood			1.347***	1.122***
			(0.266)	(0.152)
compulsory_ed			0.462	0.276*
			(0.336)	(0.165)
degree			0.0993	-0.128
			(0.593)	(0.232)
post degree			1.848***	1.735***
			(0.572)	(0.356)
areaCentre			-0.621*	-0.180
			(0.344)	(0.171)
areaSouth			-1.821*	-0.482
			(0.955)	(0.436)
inhab20000			0.555	0.418**
			(0.451)	(0.204)
inhab20000_40000			0.697	0.507**
			(0.502)	(0.228)
inhab40000_500000			0.597	0.434**
			(0.446)	(0.202)
insured			0.0845	-0.0193
			(0.219)	(0.122)
worker			-0.0800	-0.0665
			(0.489)	(0.282)
employee			0.540	0.421
			(0.524)	(0.271)
manager			0.926	0.558
			(0.616)	(0.372)
entrepreneur			0.165	0.279
			(0.695)	(0.357)
other self-employed			-0.211	-0.0532
			(0.623)	(0.349)
retired			0.244	0.354
			(0.517)	(0.284)
Constant	no	yes	yes	yes
R-squared		0.014		0.265
Number of nquest	259		259	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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