

SUBJECTIVE WELL-BEING IN ITALIAN REGIONS: A PANEL DATA APPROACH

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Abstract: We use data from the new ISTAT-BES database to estimate the socio-economic determinants of subjective well-being in Italian regions between 2004 and 2016. Empirical findings show that subjective well-being is positively associated with education, income and social relations. Our findings imply that governments should improve subjective well-being increasing the level of investment in education, deepening economic growth, reducing income inequality and promoting social relations.

Keywords: well-being; education; inequality; happiness; quality of life; Italian regions; panel.

JEL codes: C33, D63, I31, I25.

1. Introduction

The study of happiness and individual well-being is at the centre of economic debate since the Easterlin's paradox (Easterlin, 1974). The discovery that marginal increasing in income, over a certain level, is not associated with improving in happiness opened a new field in economics. In the words of Easterlin:

"Is there evidence that economic growth is positively associated with [...] human happiness? [...] The increase in output itself makes for an escalation in human aspirations and thus negates the expected positive impact on welfare." (Easterlin, 1974)

Easterlin questioned about the positive relation between income and happiness. He concluded:

"[...] for the United States since 1946, higher income was not systematically accompanied by greater happiness." (Easterlin, 1974)

Further economic studies showed that Easterlin's paradox could be applied either to study on nations or to the analysis of individuals. Socioeconomic determinants and geopolitical and cultural factors can change the ultimate marginal income improvement associated to happiness maximization.

The question of Subjective Well-Being (SWB) has obtained more consideration in the public debate due to the increasing of social and psychological pathology associated with depression, anxiety, compulsive and impulsive behaviour together with the absence of self-evaluation. Citizens and employees in post-industrialized countries seem to be at the same time wealthier, at least in the sense of per capita income, and more dismal, in the sense of social and psychological disorders. Market economies have divided income from happiness transforming a connected association in separate worlds.

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The question of the missing positive relation between income and happiness has interested the public sphere and the economics of incentives. The level of national GDP,

the structure of workforce participation, the degree of education and instruction, the possibility of a generation of a resilient human and social capital are all variables affected by a decreasing human well-being in affluent economies. Economists have tried to take into account these complex psycho-economic relations promoting new methodologies to calculate GDP. Several researchers aimed to introduce either measures able to capture human emotions about the SWB, the subjective happiness, and the subjective perspective of future. In effect, the development of technologies, machine learning techniques and artificial intelligence can operate as an important ally in the attempt to create measures able to express citizenship moods in public sentiment analysis indexes. National statistical offices can estimate individual well-being mining data through algorithms on a sample of selected citizens (Guisan, 2009a).

Never the less, it is relevant to clarify the differences between the definition of happiness and well-being. The concept of well-being includes happiness. The idea of happiness lacks social, relational and psychological elements that are considered in well-being. Our study concerns the concept of well-being instead of happiness. We know that many empirical results (such as the Easterlin paradox), that are centred on happiness, can only partially be referred to well-being. In our view, well-being is a more complex concept in respect to happiness, even if it is only an approximation of the idea of *eudaimonia* in the sense of Aristotle. In effect, in the idea of *eudaimonia* there is harmony between individual and collective well-being based on the equilibrium of the private and public interests and actions.

The present study has, at least, three elements of originality: i. a new dataset (ISTAT-BES); ii. an interdisciplinary approach to the determinants of happiness, and iii. a model based on composite indexes able to shed light on non-strictly economic foundation of happiness. Our results show that SWB is positively associated with education, income and social relations. Implication for policy makers include the necessity to rethink the welfare state and recalibrate the GDP growth process to widespread happiness among population in democratic countries, especially in Western economies.

The remaining of this paper is organized as follows. Section 2 provides a review of the literature on the determinants of happiness in an interdisciplinary approach. Section 3 provides the empirical model with an explanation of the variables and the theoretical framework. Section 4 shows the results of the econometric analysis. Section 5 presents conclusions and policy implications.

2. Review of the literature and background

Happiness and wellbeing have many dimensions. The economic literature affords many questions considering happiness either as a dependent variable either as an independent variable to explain the complex nexus among growth, development and the well society. In the following part a little anthology of scientific articles from top economists is considered to introduce the topic and creating the cultural context to our econometric analysis.

Magazzino and Mantovani (2014) examined the counterfeiting process in Italy, at a subnational level. Empirical findings show that homogeneous clusters of regions could be derived, as a result of economic and geographical reasons. Moreover, household and

public administration expenditure, indirect taxation, foreigners/population ratio and the number of ports have a positive impact on the counterfeiting diffusion index. Magazzino (2011) investigated the nexus between health care households' expenditure and GSP for Italian regions during 1980-2009. Empirical results show the presence of a long-run relationship in fifteen regions. As regards the causality analysis, health-led growth hypothesis is supported in three regions, while the reverse causation appears in five cases. The neutrality hypothesis seems to be confirmed in ten regions. Finally, a bi-directional causality flow (feedback hypothesis) has been found for two regions. Magazzino and Mele (2011) studied the same sample applying panel data techniques. The analysis shows that, if the sample is divided into three more homogeneous macro-regions (North, Centre and South), a long-run relationship between health expenditure and aggregate income is found in two areas. Furthermore, the income elasticity is below the unity, implying that health expenditure is not a luxury good.

Happiness and good governance. Heliwell (2014) analyzed the relation between good governance and happiness suggesting that the policy maker can have a huge impact on the SWB of the population. In particular, the authors consider more than 150 countries in the period 2005-2012 and try to verify what is the impact of governance on happiness. The results show that good governance can improve SWB of the population suggesting that policy makers should also target their political actions to improve the level of SWB.

Obesity and happiness in marriage. Clark and Etilé (2011) illustrated the relation between obesity and happiness in married couple. The basic idea was that the obesity is an epidemic disease, and that in a certain sense can be diffused by social contagion. Clark and Etilé (2011) found that individuals in couple are happy to have partners with the same body shape as them. The result shows that reciprocity rather than absolute values is relevant to gain happiness in married couples.

Happiness and midlife low. Blanchflower and Oswald (2019) considered the existence of midlife low, that is a reduction in happiness that affect humans in their midlife. The existence of such a midlife low effect has been proved in the literature reported in Blanchflower and Oswald (2019) even if authors improve the existent knowledge with an econometric analysis of longitudinal data for people at different ages, until 90. They found that effectively a midlife low effect exists controlling data with econometric analysis, and this confirm the idea of the presence of a U-shape curve of happiness in which people is happier at the start and at the end of their life, while in the middle experiment a deeper sense of lack of purpose, sense of tragedy for existence, and report lower levels of happiness and well-being.

Happiness, social mobility and political preferences. Clark and D'Angelo (2010) afforded the question of the presence of a relation among social mobility and political preferences in UK based on the analysis of the BHPS that is the British Households Private Survey. Authors wrote a very interesting article in which they find that the level of happiness increases for people that experiment social mobility. Yet, to measure social mobility they considered the level of social status of parents. In particular happiness increases when individuals are able to overcome the social status of their parents, and this ability seem to be related to preferences in political spectrum. In particular, the authors find that the people that are able to increase their social mobility in respect to their

parents are also oriented to vote for right wing parties. Even if the reverse is not true, i.e. not all the people that vote for Right wing parties are successful in the sense of social mobility.

Happiness and political affiliation. Dolan et al. (2008) explored the role of happiness in general election in UK. In particular, the authors questioned the impact of SWB on voting and the reverse relation of voting on SWB. They found that while SWB has an impact on voting, the act of voting per se has not any reflection on SWB. Right-wing voters are generally happier than Left-Wing voters, even if the fact of voting does not retroact on the perceived level of SWB. Anyway, no matter for political affiliation, the relation between happiness and political affiliation has a short duration, and it disappears in two months. Based on the analysis of the article it is possible to affirm that left wing government are elected by active voters with lower levels of happiness in respect of right wing government, and that this difference in the SWB of majorities can shape in some way the political economy performed by elected representatives.

Happiness and terrorism. Metcalfe et al. (2011) analyze the relationship between terrorism and the level of happiness in UK. The authors considered the terroristic attack of 11/9 at the Twin Tower and verify the impact of this event on the moods and perception of British households using BHPS. The results show a reduction in the level of SWB for British people in the aftermath of the terroristic attack, with an impact on the life of private households that has been valuated equal to a divorce and estimated as 1/3 of the happiness reduction experimented for unemployment. These effects are massive and are also considered in sterling in an amount comprehensive between 170 and 380 million sterling. Terrorism has the ability to destroy happiness and to generate economic losses at a global level, due to the fact that using media, the attack is not considered by public opinion as relegated to a foreign country, but it is interiorized as a tragedy of neighborhood tragedy. In reality the article contains an important idea, that is the interconnection of the public opinion in the globalization, that can generate large phenomena of empathy either at thousands of miles from the place in which the event is consumed.

Happiness, income and unemployment. Stutzer and Frey (2004) investigated the relationship among happiness, income and unemployment. In particular, the authors consider happiness as a measure of the utility, and are enthusiast of the possibility offered by psychometry to verify the presence of quantitative methods for evaluating happiness and well-being. Authors recall the dispute between cardinal and nominal utility showing the possibility of a solution of the dilemma using data able to evaluate subjective happiness with self-report either with all the limitation of the case. In particular authors are skeptical about the possibility of positive relation between income and happiness due to the fact that asymptotically the increasing in income does not generate an increase in happiness. The motivation for this lack of positive relation in the long run is due to the fact that generating marginal extra income is expensive for the worker in terms of hours and reduction of social life and human relationships. And it is also the case, that workers evaluate only relative incomes, so when they consider their income be at the same level with the income of their peer group, they are more willing to spend time and energy maximizing non-productive and non-monetary goods, such as friendship, relational goods, and even social and political activities. In contrary, on the other hand, unemployment has a negative impact on happiness even if the social security system is generous

in monetary transfer in respect to unemployed people. This means that being unemployed is a form not only of relational starvation and social exclusion that can negatively affect the level of perceived happiness.

Against the political economy of happiness. Frey (2011) analyzed the development of happiness economic in social sciences and either in institutional politics. In particular, the author considers the fact that the happiness approach has solved the question of the measurement of utility that was a problem in the economic science. Happiness, well-being and life satisfaction are considered as interchangeable concepts. A certain enthusiasm is shown for the fact that many countries have promoted institutions devoted to improve the level of happiness in the political economy. But at the same time, the author is skeptical about the possibility of the realization of a political economy of happiness i.e. a series of acts that governments apply to increase the level of well-being of citizenships, due to the fact that this policy can be considered paternalistic and related to the idea of a “benevolent dictator”. So if on one hand the development of happiness is considered positively for the fact that it is a measure of utility that can inspire institutional politics, on the other hand the author manifests perplexity the risk of an authoritarian determination of the set of choices than can exogenously be applied to citizens to cultivate happiness. Happiness should be a choice of individuals, and the government can only facilitate the individual pursuit of happiness.

In the same mood Frey (2017) explain the limitation of a political economy based on the National Happiness Index considered as a tool able to substitute the complex set of indexes used to measure the economic development. In effect the author says that policy makers can easily distort the meaning of the National Happiness Index reducing the ability of the government to promote the economic development in a global sense. Happiness is not a concept that can be a pure substitute of other measures such as income, wealth, level of instruction, social capital, employment, inflations, but it is at the contrary, an indicator that should be added to other indexed trying to explain the complexity and the heterogeneity of the economic phenomena.

Frey and Stutzer (2017) analyzed the relationship between public choice theory and the empirical research on happiness. In particular, the authors suggest the importance of happiness as an input in the public choice methodology to determine the mechanism of vote, to analyze rents and creating incentives and disincentives for active policies. But, at the same time, the authors considered the limitation of the usage of the National Happiness Index as a tool that aggregate the individual happiness utility maximized by the government without considering the heterogeneity of the manifestation of well-being. The authors consider happiness as a measure of individual utility and at the same time it seems to be contrary to the idea of the existence of a collective utility that can be the objective of a public policy. The idea of happiness related to this approach is market friendly, libertarian in a certain sense, and minimalist in the sense of government, for the opposition of the author to any political economy explicitly oriented to maximize national happiness.

Errors in happiness prediction. Odermatt and Stutzer (2019) explored the ability of individuals to predict their level of happiness and well-being after certain events such as

unemployment, marriage, divorce. They found that people tend to commit structural errors in the prediction of happiness after relevant event in their life, for example people are excessively pessimistic in case of unemployment and divorce, while demonstrate optimism in the case of marriage. The results are coherent with the critique to the rational choice theory that affirm the incapacity of *homo oeconomicus* to strictly apply maximization processes in the decision making processes. This cognitive bias has a huge impact either in the level of happiness of individuals either in the process of choice maximization. These errors can be due to lack of information, or absence of maps of meaning able to give sense to facts that are highly destabilizing for the economic agent.

Bruna et al. (2019) explored the economic and social contextual determinants of individual life satisfaction and happiness across Europe. The results of a random effects spatial lag hierarchical model confirm the role of regional contextual factors, as well as the significance of their spatial lags, probably indicating the presence of clustered latent variables.

Unfairness and happiness. d'Ambrosio et al. (2018) afforded the question of the relationship between unfairness and happiness in the job environment. The authors showed that if workers perceive an unfair income their level of happiness and well-being either in the sense of life satisfaction and in the sense of job satisfaction decreases significantly. The consequence of a protracted unfair income is the fact that the worker choice to quit the job in the next year. But in the main-while the worker can suffer for a series of disease such as for example the increasing in stress and anger. A fair income is able to solve the question increasing the ability of the worker to operate in the interest of the firm without reduction in individual happiness. The authors show that happiness is related to a social sense of fairness that is related to income.

Predictors of happiness during life. Clark and Lee (2017) analyzed the elements that are able to generate well-being and happiness during life. There are some essential determinants that are IQ scores, parental income and parental education. But family and income in early stage of life are not the only predictors of happiness, in effect the authors find that also mental health, years of schooling and social participation increase the probability of a happy life especially in the long run. The identification of these elements can be used to set a series of policies that can be implemented to improve the happiness in life. For example, extroverted and optimistic individuals have deeper social relations and by this means they are oriented to experiment a deeper sense of happiness during life. The authors don't exclude the necessity to control for types of personality in the process of detection of predictors of happiness. Somarriba and Pena (2008) combined the subjective perceptions and the objective conditions, to develop a satisfaction model. Guisan and Aguayo (2010) analyzed the important role of education in economic development and social wellbeing of 22 American countries. Empirical findings show that the main difference is the educational level of population and the level of spending on education. Guisan and Exposito (2010) analyzed the relationships between health expenditure, education and several indicators of human well-being in Africa and Asia. Although direct transfers to health services from international cooperation may help to alleviate their situation, generally the most important help comes through the increase of the educa-

tional level of population. Guisan (2009) showed an econometric analysis of the relationship between several indicators of economic development and wellbeing in Europe, the United States (US) and Canada, calculating a compound index.

Media and happiness. Benesch et al. (2010) analyzed the relationship between TV viewers and happiness. The authors ask if TV viewers can increase their happiness in relation to an improvement in the number of channels they can watch, or in other words they try to verify the hypothesis of non-satiety for TV viewers in respect to happiness. Even TV channels can be considered as a normal good, in effect authors find that the level of happiness for heavy TV viewers decreases with the increasing in the number of TV channels. This fact contrast with the idea that happiness can be achieved easily with a maximization of goods based on the model “much make more”. Even if initially there is a positive and more than proportional relation between increasing in the offer of good and the pursuing of happiness, at a certain point this relation turns negative, or at least less than proportional. This example can be useful, due to the fact that also the relation between income and happiness have the same behavior.

Happiness and young in Western Countries. Blanchflower and Oswald (2000) considered the relationship between young and happiness in Western Countries in the period 1972-2000. They found that contrary to the tragic common vision, the young have increased their level of happiness either in USA and in Europe. The authors sustain that there are 3 reason for this improvement in the level of happiness for young in western countries: 1) the end of cold war, 2) declining discrimination against women and black people, 3) the production of more consumer good dedicated to the young. In particular, the level of happiness for young people tends to increase for those who are unmarried.

Gender pay gap and happiness. Lalive and Stutzer (2010) analyzed the relationship between gender pay gap and happiness. Women are happier than man, even in the presence of relevant income discrimination. Women seem not to suffer for gender pay gap, at least in the sense of happiness. Paradoxically, computing an econometrics analysis the authors find that women that work in more egalitarian working environment characterized by lower gender pay gap show a lower level of life satisfaction. This counterfactual result show that the question of non-discriminatory behavior between man and woman is deeper than the trivial question of gender pay gap and is more related to the social role that woman and man have in a certain society. Guisan (2009c) presented an analysis of several socioeconomic indicators related with quality of life, economic development, human capital, social capital and women participation in politics, management, labor and income for 132 countries. The overall conclusion is that international cooperation to foster education is of uppermost importance for world development and human wellbeing.

The gene of happiness. De Neve et al. (2012) investigated the question if there exist a genetic predisposition for happiness, or in other words, if there exist a “gene of happiness”. They effectively showed that this gene exists and that it is responsible for the 33% of the happiness. It could seem as an excess in eugenics the reference to a “gene of happiness” but, contrary to trivial motivation, the question has some scientific relevance in explaining why some people show a deeper resilience in the sense of happiness either in adverse event. But at the same time the fact that this gene is responsible only for the

33% of the happiness let more chance open to a sort of pedagogy of happiness, i.e. the possibility to create mental and physical status, either with the usage of technology, that can restore happiness either after tragic events, increasing well-being.

Proto and Oswald (2017) analyzed the top nations in the ranking of mental well-being founding that some countries such as for example Denmark, UK and USA, are always at the top, while others stay at the bottom. Then authors try to explain the phenomena using unconventional analysis and suggesting the existence of a genetic motivation. The results are consistent also after having controlled for GDP of the country; the level of the Human Development Index; the geographical distance of the country from Denmark; a range of cultural and religious variables; separate dummy variables for each continent; longitude and latitude variables; indices of nations' institutions and the generosity of their welfare states. The presence of a gene of happiness seems to be confirmed by the authors, and localized in the area of Denmark.

Happiness and unemployment. Guisan and Aguayo (2020) analyzed the evolution of female employment by sector in Spain for the period 1970-2020. A gender gap in social visibility emerges. Guisan (2019) focused on the positive impact that industry usually has on the development of services and the real wage. Those impacts seem to be relevant in order to increase total and female employment. Clark et al. (2010) afforded the question of the impact of regional massive unemployment on SWB of employed. In general, the aggregate unemployment has a negative impact on the level of SWB of employed, but at the same time has a lower effect on the unemployed. The authors suggest that what is relevant in respect to the reaction to mass unemployment is the general labor market security or in other words the expectation of labor status. People that have significant job expectations suffer more for mass unemployment, even if they are unemployed. On the contrary workers, either employed or unemployed, with poor job expectations are less affected by mass unemployment and at the limit they can gain from it. This suggest the role of individual expectations in interpreting adverse events.

Poverty and happiness. Clark et al. (2015) analyzed the relation between poverty and happiness. The authors realized an empirical study questioning if the experience of poverty in life has a negative impact on life satisfaction. Clearly life satisfaction is considered as an approximation of happiness. The authors find a negative relation between happiness and poverty: people who have experienced poverty show lower life satisfaction even when they change their social and economic conditions. At the same time also the manifestation of the poverty has an impact on life satisfaction: people who has been poor continuously for a certain period show lower level of life satisfaction in respect to people that have been poor for the same period but not continuously.

Corruption and happiness. Arvin and Lew (2012) showed evidence on the relationship between happiness and aid given different levels of corruption. They found that accounting for corruption, aid has a negative marginal effect on happiness – but only in countries where corruption is most rampant.

3. The model

The empirical analysis aims at shed light on the determinants of SWB in Italy. By developing the framework above, and following Blundell and Bond (2000) and Bond *et al.*

(2001), we derive the standard equation for regional SWB specified in levels with a lagged dependent variable:

$$SWB_{i,t} = \beta_0 + \beta_1 SWB_{i,t-1} + \beta_2 ET_{i,t} + \beta_3 II_{i,t} + \beta_4 SR_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $i=1,2,\dots,21$ denotes regions, and $t=2004,2005,\dots,2016$ denotes time. The variable $SWB_{i,t}$ indicates the Subjective Well-Being index; $SWB_{i,t-1}$ represents the time lag of $SWB_{i,t}$; $ET_{i,t}$ denotes education and training index in region i at time t ; $II_{i,t}$ indicates the income and inequality index; $SR_{i,t}$ is the social relations index; and ε is an idiosyncratic error.

In greater detail, the variables included in the model are as follows¹.

3.1 Subjective Well-Being

The SWB is the dependent variable and is used as a proxy for happiness in Italian regions. In particular, SWB is considered as the variable “Satisfaction For Your Life” that is computed by ISTAT-BES as the percentage of people aged 14 who have expressed a life satisfaction score between 8 and 10 out of the total of people aged 14 and over. This variable can be considered as a proxy for SWB a perspective in the treatise of happiness. SWB is a global concept able to capture the economic and financial definition of happiness as well as to identify the limits of that complex social environment in which happiness prospers.

3.2 Education and training

Education and training is a composite index in ISTAT-BES database. It consists of five different variables: “Participation In Kindergarten”, “People With At Least A Diploma”, “Graduates And Other Tertiary Degrees” and “Participation In Continuous Training” minus the value of “Early Exit from the Educational And Training System”. The variable is relevant for the fact that education and training can be considered as a proxy for income that should be associated to happiness and individual well-being.

3.3 Income and inequality

Income and inequality is a composite index based on six independent variables built by ISTAT. In particular, the variable is based on the level of “Average Income Available Per Capita” minus “Inequality of Dispensable Income” minus “Serious Material Deprivation” minus “Low Quality Home” minus “Great Economic Difficulty” minus “Very Low Work Intensity”.

3.4 Social relations

Social relations is a composite index based on eight independent variables built by ISTAT. The composite index is built summing “Satisfaction With Family Relationship”, “Satisfaction With Friends”, “People You Can Count On”, “Social Participation”, “Civic and Political Participation”, “Voluntary Activities”, “Financing Association”, and “General Trust”. All data are collected through interview. Social relations are able to increase

¹ <https://www4.istat.it/it/benessere-e-sostenibilit%C3%A0/misure-del-benessere/le-12-dimensioni-del-benessere/benessere-soggettivo#link4>

the level of human capital, social capital and civic capital boosting respectively economic growth, social resilience and institutional development. Social relations are important also in the development of links among people able to generate knowledge, competence and attitude either implicitly. For example, some communities are more devoted to produce immaterial goods such as technological innovations, and their ability to generate value added is not only based on professional skills, but also on social relations among groups of people with particular productive capabilities. Social relations have the ability to increase happiness and individual well-being through a very large spectrum of variables interconnected shaping the environment, the culture and the moods of a population towards the same idea of psychological state such as joy and enthusiasm.

4. Results of the analysis

4.1 Estimation issues, data availability, and units of analysis

The model is estimated by means of Pooled Ordinary Least Squares (POLLS), Two-Ways Fixed Effects (TWFE), Difference GMM (GMM-Diff), and System GMM (GMM-Sys) panel data regressions (Anderson and Hsiao, 1982; Arellano and Bond, 1991; Blundell and Bond, 1998). The relatively short time span covered in the analysis implies a ‘large N /small T ’ panel, that is a larger cross-sectional (N) than time dimension in the panel (T). In fact, as remarked above, here we have $N=21$ and $T=13$. This *a priori* prevents non-stationarity from affecting our estimates through spurious correlation (Wooldridge, 2002). However, we present the results of several Panel Unit Root Tests (PURT) in Table C in the Appendix.

Because of the limited size of the dataset and the high number of potentially endogenous explanatory variables, GMM-Sys estimator is affected by the problem of instruments’ proliferation and its consequences (overfitting of endogenous variables, bias of estimates, weakening of Sargan-Hansen test), making the corresponding results unreliable (Roodman, 2007).

Another concern is endogeneity, which we aim to minimize by means of GMM estimators that use appropriate lags of the explanatory variables as instruments of their own current values. In addition, in order to resolve the problem of different accounting units, all explanatory regional variables are expressed as logarithm of a composite index.

We analysed the data with STATA version 15.1. The descriptive and correlation statistics for the study variables are shown in Tables A and B in the Appendix. SWB is positively correlated with education and training ($r=0.44$, $p<0.01$), income and inequality ($r=0.69$, $p<0.01$), and social relations ($r=0.80$, $p<0.01$). Additionally, there is a strong positive correlation between II and SR ($r=0.88$, $p<0.01$). Figure A in the Appendix provides a graphical indication of all these positive associations among selected variables.

The model is run for 2004–2016 for the 19 Italian regions and two autonomous provinces (Trent and Bolzano) in line with data availability.

4.2 Happiness and socio-economic indicators in the Italian regions: some stylized facts

Table A in the Appendix shows the key descriptive statistics for the Italian regional SWB indicator and its evolution over time. The SWB index shows a generalized decline in 2012, due to the sovereign debt crisis that hit Italy. However, the most marked reductions

are observed for the Southern regions, which also have the lowest index values (especially for Basilicata, Campania and Sicily, where in 2016 the index is below 90). The maximum value is observed in 2009 for Bolzano (129.3), while the minimum value in 2015 for Campania (69.3). A similar dynamic is shown by education and training index. However, in this case, an overall reduction is found in 2009, as consequence of the global economic and financial crisis. Here, the highest value is observed in 2016 for Trent (129.3), and the minimum in 2008 for Sicily (84.0). The performance of the index on income and inequality has been particularly varied. In fact, it increased everywhere until 2008, and then contracted in the Southern regions, stopping in the Central ones and increasing very little in the North. The maximum value is 122.0 (Bolzano in 2015), while the minimum 67.6 (Campania in 2012). As regards the social relations index, it emerges a drop in 2013. The maximum value is observed in 2014 for Bolzano (128.1), while the minimum value in 2013 for Campania (79.5).

As shown in Table 1, the variable *SWB* ranges from a minimum of 77.4 for Campania to a maximum of 125.2 for Bolzano.

Table 1. Average for the period 2004-2016 (Italian regions).

Region	SWB	ET	II	SR
Abruzzi	94.5333	111.6833	98.4500	94.0500
Basilicata	88.8667	100.7000	87.4667	89.6333
Bolzano	125.1500	111.5667	120.9167	126.0000
Calabria	92.2667	99.9667	82.7333	87.3167
Campania	77.4333	92.0167	78.3000	80.7167
Emilia Romagna	97.6667	107.6333	113.3000	106.2500
Friuli Venezia Giulia	101.2500	112.7833	111.7000	109.6000
Latium	88.2000	109.7000	100.2667	96.9000
Liguria	96.9667	14.2000	107.6167	102.3667
Lombardy	99.9833	105.5833	112.5000	106.7500
Marches	95.0167	110.0000	104.8000	99.7167
Molise	92.6833	103.2833	92.6333	89.5000
Piedmont	97.8500	106.2500	108.8667	104.0000
Puglia	88.1667	92.9000	88.7000	85.5333
Sardinia	94.1500	93.8500	92.3667	102.2000
Sicily	86.9167	87.6000	77.0500	84.6333
Trent	111.9333	121.2333	114.1667	121.3500
Tuscany	92.9667	106.2667	109.2000	105.4500
Umbria	94.8667	116.0500	104.5167	100.5833
Vallée d'Aoste	107.5000	100.4333	113.4667	106.1500
Veneto	98.7333	105.9500	110.0000	108.2500

Sources: our calculations on ISTAT-BES database.

Furthermore, it can be noted that the special statute regions of northern Italy are the only ones to exhibit a value greater than 100.

The value of Latium (88.2), third from bottom in the ranking, is quite surprising; probably this is due to the rapid deterioration, in recent years, of the quality of life in the city of Rome. Latium also records a low value on the variable *SR*. As far as the variable *ET*, excellent performances (>110) are recorded by the central regions (Umbria, Abruzzi, and Marches). Variable *II* has a clear geographical connotation: in fact, the northern regions record higher values, whilst those of the south the lower ones. The positive effect of income on happiness seems to clearly emerge: some of the unhappy regions are those with low levels of income per capita. Notwithstanding, some singularities might be detected.

In general, it is noted that the northern regions exhibit higher indicator values while those of the south are lagging behind. This is due to a multiplicity of factors, including obsolete infrastructure networks and communication systems in the South (Ciccarelli et al., 2020), together with a less efficient health system (Magazzino and Mele, 2012).

4.3 Empirical results

The estimation results based on model (1) are presented in Table 2, which show results of different estimators. Column [1] contains POLS estimation; in column [2], TWFE estimations are shown, followed by GMM-Diff results due to Anderson and Hsiao (1981) estimator in column [3], and to Arellano and Bond (1991) estimator, in column [4]; finally, in column [5] the results of GMM-Sys (Blundell and Bond, 1998) estimator are listed.

Table 2. Regression results.

	[1] POLS	[2] TWFE	[3] AH	[4] AB	[5] BB
SWB _{t-1}	0.2933*** (0.0790)	0.8746** (0.1188)	0.1415* (0.0728)	0.2665*** (0.0583)	0.0303 (0.0897)
ET	0.0220 (0.0675)	0.3323* (0.1890)	0.9082*** (0.2135)	0.6373*** (0.2135)	0.9061*** (0.2625)
II	0.0524 (0.0796)	0.0394 (0.1864)	0.5744*** (0.2154)	0.6185*** (0.2421)	0.6030** (0.2533)
SR	0.2508** (0.1000)	0.1456 (0.2034)	0.4014* (0.2258)	0.4828** (0.2463)	0.6974** (0.3502)
Dummies/ Trends	Included	Implicit	Included	Included	Included
Obs.	105	105	84	84	105
Regions	21	21	21	21	21
F/Wald	25.02 (0.0000)	118.03 (0.0000)	85.67 (0.0000)	60.84 (0.0000)	35.83 (0.0004)
RMSE	3.8970	3.2504			
R ²	0.7355	0.8112			
CS Dep. test	(0.261)	(1.779)	(0.000)	(0.000)	(0.000)
AB test for AR(1)			(0.063)	(0.002)	(0.747)
AB test for AR(2)			(0.123)	(0.847)	(0.485)
SH test			(0.307)	(0.087)	(0.759)
Residuals	I(0)	I(1)	I(1)	I(0)	I(0)
JB test	(0.8363)	(0.0001)	(0.0909)	(0.0518)	(0.0955)
F/ $\chi^2_{II,SR}$	5.59***	8.33**	12.16***	13.46***	33.37***

Notes: Robust Standard Errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

In Table 2, we first control for the autoregressive term – that is, the lagged level of regional SWB – whose significantly positive (albeit small) coefficient suggests a weak trend towards regional divergence, which implies that first the economic-financial crisis and then that of sovereign debts amplified the inter-regional differences.

Concerning the impact of our selected independent variables on regional SWB (the dependent variable), our initial results (Table 1, regressions 1-2) show a lack of statistical significance for two out of three regressors. Specifically, in the POLS estimations only social relations are statistically significant (at the 5 percent significance level), while in the TWFE estimates education and training represents the unique variable that significantly affects the regressand (at the 10 percent significance level). However, one of the downsides of these estimations is that they are prone to endogeneity. We therefore re-estimate the same basic model by means of GMM, which accounts more effectively for potential endogeneity problems, and uncover a non-negligible positive effect of all our three regressors (Table 1, regressions 3-5). As expected, the GMM-Diff estimations correct the downward bias in the TWFE estimation, confirming the correct specification of the model in line with the Hansen test.

The test statistics for all specifications are presented in the lower section of each table and confirm the robustness of the results discussed below. In particular, the Arellano-Bond test for serial correlation in the first differences of the residual does not reject the hypothesis of no first-order serial correlation at higher orders, as desired. This allows us to exclude the presence of residual serial correlation in the original error term.

In addition, the Hansen statistic is used to test for over-identifying restrictions: the Hansen coincides with the Sargan test for ‘non-robust’ GMM but, if non-sphericity is suspected as in the case of our robust GMM estimations, the Sargan test would be inconsistent and the Hansen test is to be preferred (Roodman, 2006). The Hansen test confirms the validity of selected instruments in all specifications. Moreover, unit root and stationarity tests on the model’s residuals reveal that AB and BB estimators produce residuals that are integrated at order 0 (or $I(0)$), which implies stationary residuals.

The Jarque-Bera test results – a skewness and kurtosis test for normality – indicate that we cannot reject the null hypothesis that GMM models’ residuals are normally distributed, at least at the 5% level. Finally, a Wald test on jointly statistical significance of II and SR clearly rejects H_0 hypothesis, suggesting that at least one of these two independent variables exerts an effect on SWB.

In our results, we found a positive relation between happiness and education. These results are consistent with Cuñado and de Gracia (2012), Gerdtham and Johannesson (2001), partially with Michalos (2017), but in contrast with Hartog and Oosterbeek (1998). Moreover, a positive relation between happiness and income emerges in our estimates, in line with Boyce *et al.* (2010), Caporale *et al.* (2009), Dunn *et al.* (2008), Dynan and Ravina (2007), Hagerty and Veenhoven (2003), while Stutzer (2004), Easterlin (2001; 1995), and Diener and Oishi (2000) provided opposite findings. Finally, our applied findings show a positive relation between happiness and social relations, as in Delle Fave *et al.* (2011), Giu and Stanca (2010), Haller and Hadler (2006), Caprara and

Steca (2005), Uchida *et al.* (2004), Kitayama and Markus (2000), Argyle and Lu (1990), and Hotard *et al.* (1989).

5. Concluding remarks and policy implications

This study investigates the relationship among Subjective Well-Being, education, income and social relations in a panel of 19 Italian regions and two independent provinces, with data ranging from 2004 to 2016. The empirical strategy used several panel data estimators (POLS, TWFE, GMM-Diff, and GMM-Sys).

Our empirical findings show that happiness is positively related to income, education and social relations. Policymakers can increase happiness among population increasing per capita GDP, reducing Gini Index, strengthening the educational systems, and developing social cohesion. Our results seem to be in contradiction with two main economic ideas: the Easterlin (1974) paradox about happiness-income relation and the Hirschman (2002) proposition of the existence of a zero-sum game between individual interests and public actions.

The positive relation between well-being and income is coherent with the critique to Easterlin paradox as indicated in Stevenson and Wolfers (2013) and Sacks *et al* (2012). Policymakers can increment the level of well-being increasing GDP per capita in absolute value. Wealthier people are happier in respect to poorer people. Wealthier countries have higher level of well-being in respect to poorer countries. The presence of a satiation point in which the positive relation between income and well-being turns negative is rejected.

In addition, also the idea of a juxtaposition of private interests and public action does not apply for our data, since happiness increases both with per capita GDP and with social relations. Therefore, it seems that the Hirschman effect does not hold. Policymakers can improve well-being through policies able to promote a more sustainable balance between public and private life. Citizens can be happier if they might increase their individual wealth taking care of their private interests and, at the same time, participate in the social life of the community. There is no contradiction between private and public interest in the pursuit of well-being. However, policymakers can remove some obstacles in the pursuit of well-being, for example reducing working hours for employee that require deeper social commitment, and promoting a more harmonious balance between private and public life.

Further studies may be use disaggregated data, in order to better clarify the effect of each component to the overall well-being.

Finally, we can say that the Italian path to well-being puts together income, education and social relations in a sort of public happiness resembling the idea of Verri (1763) and the *eudaimonia* in the sense of Aristotle. Our results show that policy makers can increase the well-being in the population promoting GDP growth, developing social cohesion and strengthening the educational system.

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Appendix

Table A. Descriptive statistics, 2004-2016.

Variable	Mean	Median	SD	Skewness	Kurtosis	IQR	CV
SWB	97.3409	95.9500	12.4046	0.4234	3.1199	14.7000	0.1274
ET	105.6098	106.1500	9.1034	-0.1793	2.5398	11.5000	0.0862
II	102.0848	106.1500	12.9277	-0.6399	2.3751	21.5500	0.1266
SR	101.3948	101.9000	12.3541	0.2851	2.4865	16.3000	0.1218
Region	Variable	Mean	Median	SD	Skewness	Kurtosis	IQR
Abruzzi	SWB	94.5333	93.2500	5.2815	0.8944	2.5815	6.6000
	ET	111.6833	113.0500	2.9451	-0.9111	2.2282	4.2000
	II	98.4500	98.5000	1.4516	-0.0825	1.8709	2.1000
	SR	94.0500	94.1000	2.3373	0.0563	2.4344	1.9000
Basilicata	SWB	88.8667	84.9500	12.0199	0.6309	1.8749	19.7000
	ET	100.7000	100.8000	1.8931	-0.3633	1.8784	2.8000
	II	87.4667	87.9000	2.8717	-0.2605	1.4449	4.9000
	SR	89.6333	89.9500	3.3488	-0.0015	1.8389	4.5000
Bolzano	SWB	125.1500	125.4500	3.7591	-0.8375	2.7688	3.4000
	ET	111.5667	111.1000	8.0346	-0.0338	1.5336	14.8000
	II	120.9167	120.9500	0.8060	-0.3889	2.5290	0.8000
	SR	126.0000	125.8500	1.3755	0.3728	1.9495	2.2000
Calabria	SWB	92.2667	88.3000	8.4859	0.7865	1.9487	13.1000
	ET	99.9667	99.2000	2.3712	0.5370	1.7843	3.6000
	II	82.7333	83.9500	3.5753	-1.6135	3.8865	1.7000
	SR	87.3167	87.3500	1.9446	-0.0993	2.5674	1.7000
Campania	SWB	77.4333	73.2000	9.8242	0.8190	2.0721	15.1000
	ET	92.0167	93.2500	2.6686	-0.7634	1.8708	4.4000
	II	78.3000	79.3000	6.0561	-0.8551	2.7382	6.3000
	SR	80.7167	80.7000	0.8035	-0.3009	1.8556	1.2000
Emilia Romagna	SWB	97.6667	95.1500	6.7459	0.4351	1.6814	10.6000
	ET	107.6333	107.7500	2.0245	-0.3623	1.9991	3.0000
	II	113.3000	112.8500	0.9716	0.9760	2.5015	1.1000
	SR	106.2500	106.6500	2.4874	-0.3355	2.1545	3.1000
	SWB	101.2500	100.2000	3.8558	0.5018	1.8057	6.1000
	ET	112.7833	111.9500	4.9572	0.2205	1.6248	8.7000

Friuli Venezia Giulia	II	111.7000	111.7000	0.6603	-0.0000	2.5455	0.6000
	SR	109.6000	108.0000	2.8768	0.6864	1.5043	5.6000
Latium	SWB	88.2000	87.5000	4.2558	0.4075	1.7885	7.0000
	ET	109.7000	109.9500	2.6130	-0.1701	1.3907	5.0000
	II	100.2667	98.9500	3.2235	0.5064	1.5186	5.9000
	SR	96.9000	96.1500	1.6273	1.0360	2.6528	1.7000
Liguria	SWB	96.9667	93.5000	9.4159	0.8242	2.1842	14.2000
	ET	14.2000	111.0500	1.5289	1.3013	3.3630	1.2000
	II	107.6167	107.1500	2.4653	0.7292	2.3482	2.7000
	SR	102.3667	102.8000	1.8790	-0.3973	1.8196	3.0000
Lombardy	SWB	99.9833	96.9500	5.3537	0.7032	1.5530	9.7000
	ET	105.5833	106.0000	2.4310	-0.2255	1.5613	4.9000
	II	112.5000	113.0000	2.0919	-0.1809	1.8059	3.2000
	SR	106.7500	106.7500	1.9191	0.0156	1.4594	3.8000
Marches	SWB	95.0167	93.0000	5.2803	1.2085	3.1645	4.0000
	ET	110.0000	109.4500	3.6617	0.1967	1.5497	7.2000
	II	104.8000	105.1500	1.0080	-1.2708	3.1907	1.0000
	SR	99.7167	99.4500	2.0904	0.4035	1.7982	3.2000
Molise	SWB	92.6833	90.7000	10.5717	-0.1176	1.9847	15.0000
	ET	103.2833	103.1500	2.1075	0.2942	1.7751	3.6000
	II	92.6333	93.4000	2.2006	-0.6951	1.9795	3.4000
	SR	89.5000	89.7000	2.7085	-0.2358	1.7372	4.5000
Piedmont	SWB	97.8500	96.4000	5.9641	0.3828	1.8915	8.9000
	ET	106.2500	105.8500	2.7581	0.2055	1.5431	5.6000
	II	108.8667	108.9500	1.3967	-0.4732	2.8656	0.8000
	SR	104.0000	104.3000	1.8547	-0.6373	2.3470	2.2000
Puglia	SWB	88.1667	84.6500	7.6977	0.7851	1.9390	12.1000
	ET	92.9000	93.4500	2.9100	-0.6126	2.5286	3.0000
	II	88.7000	88.5500	1.2361	0.1573	1.7528	2.0000
	SR	85.5333	85.5500	1.2941	-0.2391	1.9116	2.0000
Sardinia	SWB	94.1500	92.1500	5.6797	0.5974	1.7035	10.2000
	ET	93.8500	93.1000	1.8393	0.7526	1.9493	3.0000
	II	92.3667	92.2000	2.4744	0.6231	2.3163	3.4000
	SR	102.2000	101.9000	2.1175	-0.1553	2.0374	3.0000
Sicily	SWB	86.9167	81.3000	10.4206	0.7757	1.7697	17.2000
	ET	87.6000	88.0500	1.5773	-0.9191	2.7451	1.6000
	II	77.0500	76.1500	4.4158	0.7706	2.4421	5.9000
	SR	84.6333	84.7000	0.9606	0.9606	1.6896	1.7000
Trent	SWB	111.9333	113.3000	7.9989	-0.1032	1.5180	13.7000

	ET	121.2333	120.3500	3.6773	0.0572	1.7990	5.8000
	II	114.1667	114.0500	1.9623	-0.0738	2.0167	2.8000
	SR	121.3500	120.5500	3.0468	0.6068	2.1295	3.9000
Tuscany	SWB	92.9667	89.8000	7.3478	0.5621	1.5731	13.0000
	ET	106.2667	105.4000	3.6941	0.6582	2.1375	5.6000
	II	109.2000	109.1000	0.7849	0.9244	2.7397	0.9000
	SR	105.4500	105.6000	2.5743	0.2580	2.6161	2.1000
Umbria	SWB	94.8667	92.3500	5.2576	0.6522	1.6335	9.4000
	ET	116.0500	116.2000	2.4081	-0.1444	1.7686	4.1000
	II	104.5167	104.4000	2.8442	0.1027	1.2484	5.0000
	SR	100.5833	100.5500	2.9949	0.5102	2.3024	3.6000
Vallée d'Aoste	SWB	107.5000	105.5500	6.0893	0.4577	1.7775	9.5000
	ET	100.4333	100.7000	5.9507	-0.0603	1.5854	11.6000
	II	113.4667	113.9000	1.3589	-0.9132	2.4868	1.8000
	SR	106.1500	105.6000	4.3588	0.7414	2.4192	5.3000
Veneto	SWB	98.7333	96.5500	4.2730	0.6617	0.6617	8.1000
	ET	105.9500	105.3000	3.8250	0.2734	1.5186	7.9000
	II	110.0000	109.8500	0.6782	0.8216	2.8367	0.5000
	SR	108.2500	108.6000	2.0147	-0.2723	1.5337	4.1000

Notes: SD: Standard Deviation; IQR: Inter-Quartile Range; CV: Coefficient of Variation.

Table B. Correlation matrix.

Variable	SWB	ET	II	SR
SWB	1.0000			
ET	0.4390* (0.0000)	1.0000 (0.0000)		
II	0.6936* (0.0000)	0.6372* (0.0000)	1.0000	
SR	0.7962* (0.0000)	0.6605* (0.0000)	0.8811* (0.0000)	1.0000

Notes: Bonferroni's correction applied, P-Values in parentheses. * $p < 0.05$.

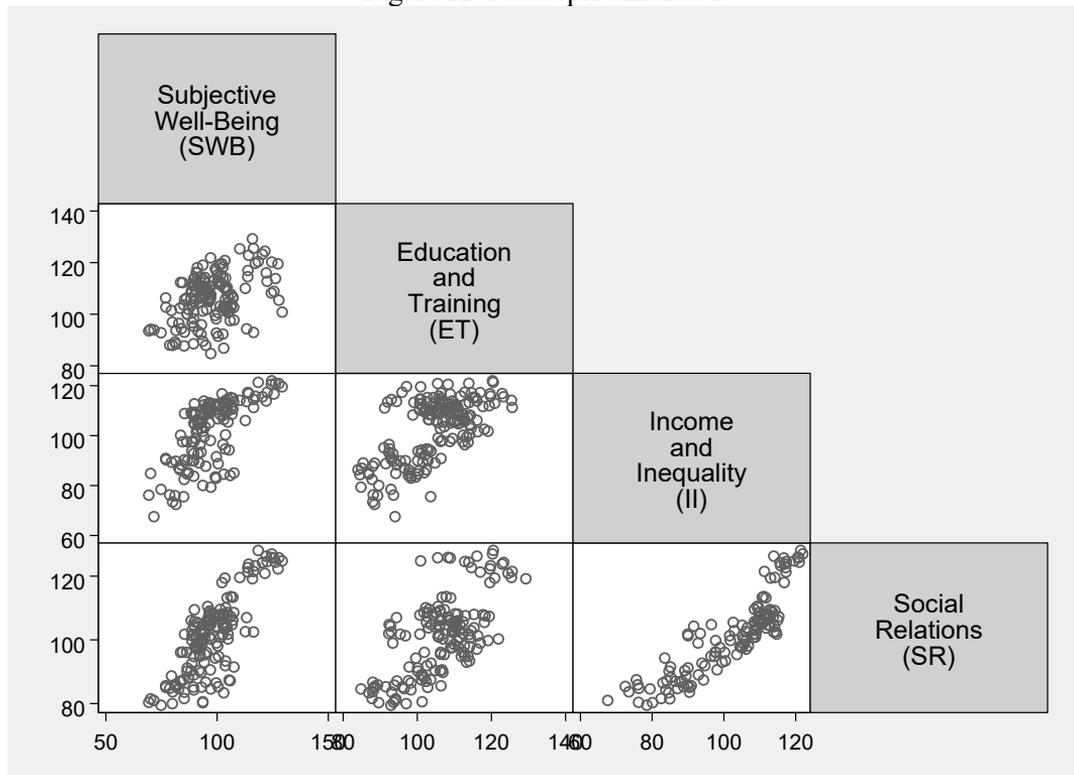
Table C. Panel unit root tests.

SWB	
Test	Results
1. Levin-Lin-Chu (2002)	-10.2493*** (0.0000)
2. Harris-Tzavalis (1999)	-5.6503*** (0.0000)
3. Breitung (2000)	-3.5652*** (0.0002)
4. Im-Pesaran-Shin (2003)	-2.2713** (0.0116)
5. Choi (2001)	5.4804*** (0.0000)
6. Hadri (2000)	3.4036*** (0.0003)
7. Nyblom-Harvey (2000)	1.4286*** (0.0000)
8. Hadri (2000) LM	14.639*** (0.0000)
9. Maddala-Wu (1999)	260.6900*** (0.0000)
10. Herwartz-Maxand-Walle (2017)	-1.2332 (0.1087)
ET	
Test	Results
1. Levin-Lin-Chu (2002)	-5.4294*** (0.0000)
2. Harris-Tzavalis (1999)	0.7201 (0.7643)
3. Breitung (2000)	0.1907 (0.5756)
4. Im-Pesaran-Shin (2003)	1.1243 (0.8695)
5. Choi (2001)	5.1657*** (0.0000)
6. Hadri (2000)	14.2303*** (0.0000)
7. Nyblom-Harvey (2000)	1.7778*** (0.0000)
8. Hadri (2000) LM	10.247*** (0.0000)
9. Maddala-Wu (1999)	22.4606 (0.9942)
10. Herwartz-Maxand-Walle (2017)	0.0770 (0.5307)
II	
Test	Results
1. Levin-Lin-Chu (2002)	-1.8218*** (0.0000)
2. Harris-Tzavalis (1999)	-5.9211*** (0.0000)
3. Breitung (2000)	-3.9359*** (0.0000)
4. Im-Pesaran-Shin (2003)	-1.8037** (0.0356)
5. Choi (2001)	1.3696* (0.0854)
6. Hadri (2000)	8.9633*** (0.0000)
7. Nyblom-Harvey (2000)	2.3056*** (0.0000)
8. Hadri (2000) LM	6.223*** (0.0000)
9. Maddala-Wu (1999)	71.4644*** (0.0031)
10. Herwartz-Maxand-Walle (2017)	0.6708 (0.7488)
SR	

Test	Results
1. Levin-Lin-Chu (2002)	-12.2537*** (0.0000)
2. Harris-Tzavalis (1999)	-6.4810*** (0.0000)
3. Breitung (2000)	-4.6208*** (0.0000)
4. Im-Pesaran-Shin (2003)	-2.9045*** (0.0000)
5. Choi (2001)	6.5739*** (0.0000)
6. Hadri (2000)	15.3906*** (0.0000)
7. Nyblom-Harvey (2000)	3.0973*** (0.0000)
8. Hadri (2000) LM	14.639*** (0.0000)
9. Maddala-Wu (1999)	304.7047*** (0.0000)
10. Herwartz-Maxand-Walle (2017)	-1.2774 (0.1012)

Notes: P-Values in parentheses. Tests include the intercept. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Figure A. Scatterplot matrices.



Sources: authors' elaborations on ISTAT-BES database.