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The Role of Social Capital in Explaining the Happiness-Income Relation

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To A.W.

My Individual Happiness

Contents

Summary

This dissertation analyses the role of social capital in explaining the happiness-income relation. It consist of three chapters:

1. Survey chapter explaining why *happiness* and *social capital* are actually a part of economic science;
2. Research chapter on eliminating the negative effects of income comparisons on well-being (the role of social capital);
3. Research chapter on the importance of income and social capital for well-being during economic shocks (the case of financial crisis in Europe).

Chapter 1. Since the Easterlin's 1974 article economists have been expressing more and more interest in defining the sources of happiness. Their main task for over 40 years now has been to identify economic and non-economic sources of well-being in order to define polices aimed at maximizing happiness in nations. However, they have not precisely explained why the so-called "happiness economics" is actually a part of economic science. This chapter surveys the latest findings of the well-being literature to show that happiness is an economic concept. Firstly, happiness is a determinant of economic outcomes: it increases productivity and one's future income, as well as the probability of finding re-employment. Secondly, happiness data has been used to: value the intangibles (non-market goods such as air and clean water), derive the marginal rates of substitution, and to understand habits and preference formation. The second part of this chapter reviews the literature on social capital, showing that it is not only a component of human happiness, but it also plays a significant role in explaining economic outcomes. Finally yet importantly, numerous national and international research initiatives demonstrate that happiness and social capital are important components of quality of life and they should be considered in the process of implementing the well-being policies.

Chapter 2. Are unhappiness, high concern for money and scarcity of social capital different faces of the same phenomenon? Economists tend to treat these variables as distinct correlates of well-being. On the contrary, positive psychologists argue that they all relate to materialism, a system of personal values ascribing great importance in life to extrinsic motivations and low priority to intrinsic motivations. Using data from two European cross-sectional surveys and the German Socio-Economic Panel, I test the hypothesis that material interests, proxied by the effects of individual and reference income on well-being, are associated with low levels of social capital. The results suggest that people with scarce social capital tend to have greater material interests, whereas the negative effect of income comparisons on well-being is eliminated for individuals exhibiting the highest levels of social capital. The implication of such finding is that promoting social capital reduces people's material concerns and has positive impact on their well-being. The results from a country-level analysis additionally show that, since social capital moderates the importance of income for well-being on individual level, the well-being gap between income groups is significantly smaller in countries with higher social capital.

Chapter 3. I compare the role of income and social capital for well-being in times of economic crisis in Europe. I use European Social Survey data from 2006 to 2012 to test the following hypothesis: i. social capital predicts well-being also in times of crisis; ii. the

importance of material concerns increases, but the importance of other determinants of well-being does not change. Regression analysis with interaction effects and the Blinder-Oaxaca decomposition confirm the role of social capital for people's well-being thus supporting the view that also in times of crisis, when material concerns are urgent, policies for recovery should mind their effects for social capital.

1 Why Should Economists Care About Happiness and Social Capital? Surveying the Literature

At Google we know that health, family and well-being are an important aspect of Googlers' lives. We have also noticed that employees who are happy demonstrate increased motivation. We work to ensure that Google is an emotionally healthy place to work.
– Lara Harding, People Programs Manager, Google

Abstract

Since the Easterlin's 1974 article economists have been expressing more and more interest in defining the sources of happiness. Their main task for over 40 years now has been to identify economic and non-economic sources of well-being in order to define polices aimed at maximizing happiness in nations. However, they have not precisely explained why the so-called "happiness economics" is actually a part of economic science. This chapter surveys the latest findings of the well-being literature to show that happiness is an economic concept. Firstly, happiness is a determinant of economic outcomes: it increases productivity and one's future income, as well as the probability of finding re-employment. Secondly, happiness data has been used to: value the intangibles (non-market goods such as air and clean water), derive the marginal rates of substitution, and to understand habits and preference formation. The second part of this chapter reviews the literature on social capital, showing that it is not only a component of human happiness, but it also plays a significant role in explaining economic outcomes. Finally yet importantly, numerous national and international research initiatives demonstrate that happiness and social capital are important components of quality of life and they should be considered in the process of implementing the well-being policies.

1.1 From Easterlin Paradox to Economics of Happiness

In 1974, an economist, Richard Easterlin posed the question: "Does economic growth improve the human lot?". Today we know that the answer is – as usual in economics – "it depends". Decades of progress in well-being studies confirmed something that social scientists have known for a long time: the level of average reported happiness is higher in richer countries. This is because a more prosperous economy can provide people with better jobs and better public goods. But why economic growth is not always *followed* by happiness growth? The answer originally proposed by Easterlin (1974, 1995) was twofold: i. because people compare their incomes with others (social comparisons); ii. because people get used to higher incomes (hedonic adaptation). That is why the happiness-income relationship is of a "static nature" – there is a positive correlation at a given time, but there is no correlation between changes in time. In other words, raising the incomes of all will not increase the happiness of all.

Both explanations proposed by Easterlin highlight the role of psychological factors in understanding the happiness-income relationship. More recent studies emphasize, instead, the importance of socio-economic approach to the explanation. Whether economic growth improves or not the human lot depends also on its social costs. If the economy continues to grow at a cost of other important things for well-being, such as human relationships or social cohesion, it may even lead to a drop in people's well-being. The best example of such scenario is the case of China, which, in the last two decades, exhibited a dynamically increasing economic prosperity, but at the same time a decreasing trend of happiness. The phenomenon is explained by Bartolini and Sarracino (2015), who claim that the drop in well-being was caused by declining social capital and an increasing orientation of Chinese people toward materialistic values.

Mikucka and Sarracino (2014) go one step forward by indicating the conditions for making economic growth compatible with happiness growth. Using multilevel regression analysis and the integrated World Values Survey - European Values Study data-set (covering 47 countries in a 30-year timespan), they show that economic growth has a positive effect on subjective well-being in presence of increasing social trust and decreasing income inequality.

Another interesting result linking the happiness-income realtionship with its social aspects is provided by Oishi et al. (2011). Applying the American General Social Survey data from years 1972-2008, the authors arrive at a conclusion that the inverse relation between income inequality and happiness is explained by perceived fairness and general trust.

Still, the original as well as the alternative explanations of the Easterlin Paradox treat happiness as a dependent variable, explained with various economic (e.g. income, unemployment) and non-economic (e.g. human relationships) factors. This has been the standard approach for at least four decades of progress in the well-being research. But the question is: why studying happiness should actually be a part of economic science? Why should economist care about subjective well-being? What does it have to do with the key concepts of economics, such as efficient use of resources, productivity, or decision making?

Instead of regarding happiness as an outcome variable, an innovative stream in the happiness literature proposed to treat it as an input, in other words, as a determinant of things that are naturally more important to economists. This introductory chapter reviews the happiness

literature from an economic perspective and explains why research on subjective well-being is no longer simply *econometrics* of happiness (i.e. defining the determinants of well-being), but it has become also an actual *economics* of happiness (i.e. implementing well-being into economic models and using it as a predictor of economic behaviour).

In the first part of the remainder of this chapter I summarize recent results showing that happiness, originally used by economists as a proxy of utility, may increase productivity and one's future income, as well as the probability of finding re-employment. What is more, "happiness data"[1] has been applied to value the non-market goods (e.g. clean air), to derive the marginal rates of substitution, and to understand habits and preference formation. The second part of the chapter reviews the literature on social capital, emphasizing that it should be considered not only as a determinant of well-being, but also as a significant ingredient of economic growth. Additionally, I outline papers proposing possible policies for increasing people's social capital. The last section is dedicated to the latest development in the so-called quality of life studies which recommend the inclusion of both, social capital and subjective well-being among the standard components of quality of life indicators.

1.2 Happiness in Economics

1.2.1 Happiness and Utility

In their textbook *Economics*, Krugman and Wells (2013, p. 14) state:

> *You might imagine that the efficient use of resources has something to do with money, maybe that it is measured in dollars-and-cents terms. But in economics, as in life, money is only a means to other ends. The measure that economists really care about is not money but people's happiness or welfare.*

Indeed, the argument that initially encouraged economists to apply happiness data in their studies was that reported levels of well-being could serve as a measure of welfare, or, of what we know under the term *utility*. By this manner, estimating happiness regressions became a way to identify various economic and non-economic components of human well-being (see the latest reviews by Becchetti and Pelloni, 2013; Ferrer-i-Carbonell, 2013; Frey et al., 2014; MacKerron, 2012).

Rayo and Becker (2007, p. 487) proposed to consider happiness as a part of economic science by relating it directly to the process of decision making and maximizing utility:

[1] By "happiness data" I mean "surveys of the reported well-being of hundreds of thousands of individuals across countries and continents" (Graham, 2005a, p. 41). For example, the European Union Study on Income and Living Conditions (EU-SILC, Well-being Module 2013) asks: *Overall, how satisfied are you with your life these days? Please answer on a scale of 0 to 10, where 0 means 'Not at all satisfied' and 10 means 'Completely satisfied.* Blanchflower and Oswald (2004, p. 1361) explain why happiness scores obtained from such surveys are a reliable source of information: "Self-reported measures are recognized to be a reflection of at least four factors: circumstances, aspirations, comparisons with others, and a person's baseline happiness or dispositional outlook". The authors note that reported happiness correlates with: objective characteristics such as unemployment; the person's recall of positive versus negative life-events; assessments of the person's happiness by friends and family members as well as by his or her spouse; heart rate and blood-pressure measures responses to stress; skin-resistance measures of response to stress; psychosomatic illnesses such as digestive disorders and headaches; duration of authentic or so-called Duchenne smiles (a Duchenne smile occurs when both the zygomatic major and obicularus orus facial muscles fire, and human beings identify these as "genuine" smiles); electroencephelogram measures of prefrontal brain activity.

> *We presume that maximizing happiness is the fundamental goal of the individual when making decisions. We believe that happiness evolved precisely as a decision-making device. In this sense, we consider that maximizing happiness is closely linked, if not identical, to maximizing utility in the standard economic way.*

The use of happiness data for estimating utility function created an opportunity for empirical tests of certain microeconomic concepts.

According to the principle of *diminishing marginal utility*, "the more of a good or service you consume, the closer you are to being satiated – reaching a point at which an additional unit of the good adds nothing to your satisfaction" (Krugman and Wells, 2013, p. 272). Analysing data for more than 450,000 respondents surveyed in the Gallup-Healthways Well-Being Index study, Kahneman and Deaton (2010) showed that emotional well-being rises with the level of earnings, but there is no further progress beyond an annual income of $75,000.

Two other microeconomic concepts well-verified with happiness data are *habit formation* and *interdependence of preferences*. As explained by Kapteyn (1985, p. 8): "Habit formation is the phenomenon by which my behaviour in the past (or results of that behaviour) influences my present preferences. Preference interdependence denotes the phenomenon by which behaviour of others influences my preferences". Numerous studies on the happiness-income relation showed that individual well-being depends not only by one's current level of earnings, but also on: i. the past earnings (Bartolini et al., 2013b; Di Tella et al., 2010) ii. the aspiration level of earnings (McBride, 2010; Stutzer, 2004) and the expectations about future earnings (Liu and Shang, 2012; Tsui, 2014); iii. the earnings of others (Clark et al., 2008; Clark and Oswald, 1996; Ferrer-i-Carbonell, 2005; Luttmer, 2005). There is also evidence revealing that the importance of positional concerns (social comparisons) for well-being is different for different goods (Solnick and Hemenway, 2005)

The following sections will answer questions going beyond the standard happiness-utility debate: i. can we use happiness regressions for further economic analysis, or are they the final scope of happiness research? ii. is it plausible to perceive economic circumstances of life (e.g. income and unemployment) solely as determinants of happiness, or also as outcomes *determined* by happiness?

1.2.2 Happiness and Valuation of Non-Market Goods

Deaton and Stone (2013, p. 591) note that "[v]arious subjective well-being (SWB) measures have been used to provide new insights and to capture a number of difficult-to-measure phenomena, such as the trade-off between inflation and unemployment, the costs of air pollution, or the values attached to environmental amenities". Indeed, one of the purely economic applications of happiness data is the valuation of non-market goods.

The *equivalent income approach* is a method to assign monetary value to non-market dimensions of life, such as: health status, family size, climate, or noise. As explained by Decancq et al. (2015a, p. 94), "the equivalent income is the level of income that would make the individual indifferent (as judged by his own preferences) between his current situation and the hypothetical reference situation where he would be at the reference values for all non-income dimensions of life".

The use of happiness data for valuation studies has been applied in health economics to value: illnesses (Ferrer-i-Carbonell and Van Praag, 2002; Groot et al., 2004); hours of provided informal care (Van den Berg and Ferrer-i-Carbonell, 2007); and the death of a relative (Oswald and Powdthavee, 2008). In ecological economics the equivalent income approach has served to assess the value of: climate (Brereton et al., 2008; Frijters and Van Praag, 1998); airport noise (Van Praag and Baarsma, 2005); air quality or pollution (Levinson, 2009; Luechinger, 2009; Welsch, 2006); and flood disasters (Luechinger and Raschky, 2009). Finally, the technique has also been used to value other non-income goods, such as: family size (Plug and van Praag, 1995), marriage (Clark and Oswald, 2002), social relationships (Powdthavee, 2008), or terrorism (Frey et al., 2009).

Following the example proposed by Ferrer-i-Carbonell (2013, p. 52), suppose that we want to estimate individual satisfaction S_i as:

$$S_{it} = \alpha log(y_{it}) + \beta h_{it} + \sum_k \gamma_k z_k + \varepsilon \tag{1}$$

where: y_{it} is individual income; h_{it} is the variable we would like to value (for example, individual health status measured by the number of chronic illnesses); $\gamma_k z_k$ are the control variables (socio-demographic characteristics: sex, age, marital status, etc.); ε is the error term of standard properties. The estimated α and β can be used to drive the change in income that, in terms of satisfaction/utility, would be equivalent to a change in the initial health status (i.e. equivalent income). The alternative approach leading to different results (see Ferrer-i-Carbonell, 2013, pp. 52-54), would be to derive the income needed to bring the individual satisfaction back to its initial level after a decline of health (i.e. compensating income). In this way, the relation of the estimated α and β is used to derive the monetary value of a marginal change of health.

The equivalent income method has two distinctive features relevant for the economic definition of utility. Firstly, the happiness equation includes income in logarithm terms, allowing for the decreasing marginal utility of income. The monetary value of a non-market good will actually depend on the current level of income, whereas richer individuals will require a larger income compensation. Secondly, as observed by Ferrer-i-Carbonell (2013, p. 52), "this method can only provide a monetary value for goods that have no related market or whose related market fails. Suppose we want to know the cost of commuting time. With no market failures, the cost of commuting would be embedded into wages and house prices, and thus commuting should have no impact on happiness, once we control for income". The case of commuting time is analysed by Stutzer and Frey (2008), who note that the related time loss will only affect happiness if the housing and labour markets do not entirely compensate for commuting time. What follows, the monetary value of time estimated with the equivalent income method includes only the costs that are not already incorporated within the house prices and wages.

Van Praag and Baarsma (2005) apply a mixed approach. They value noise damage (caused by aircraft around Amsterdam Airport) as "the sum of hedonic house price differentials and a residual cost component", whereas "[t]he residual costs are assessed from a survey, including an ordinal life satisfaction scale, on which individual respondents have scored" (p. 224). Their estimates show that a monthly net household income of 1,500 EUR would have to be increased

by roughly 34 EUR in order to compensate for a noise increase from 20 to 30 *Ku*, while an increase of noise from 20 to 40 *Ku* would require an income compensation of approximately 57 EUR.[2]

Decancq et al. (2015b) introduce an improved form of the equivalent income method in which they: i. control for individual fixed effects (e.g. extroversion and emotional stability – both influencing life satisfaction and, therefore, the estimated values); ii. allow for preference variation among individuals (through releasing the assumption of identical preferences, represented by perfect substitutability between components of satisfaction/utility). In their work, they adopt a basic linear happiness equation with individual fixed effects α_i:

$$S_{it} = \alpha_i + \mu_t + \gamma_1' \ell_{it} + \gamma_2' Z_{it} + d_{it} \tag{2}$$

where S_{it} is the life satisfaction expressed by individual i in period t, ℓ_{it} is a vector of variables capturing the life conditions of individual i (e.g. income, quality of housing, health), Z_{it} is a vector of personal characteristics (e.g. gender, age, marital status) which act as scaling variables, d_{it} is a disturbance term, and (γ_1, γ_2) is a vector of coefficients to be estimated. In order to model the differences and changes in preferences, Decancq et al. (2015b, p. 1091) introduce interactions of the conditioning variables Z_{it} with income y_{it} and other life dimensions q_{it}:

$$S_{it} = \alpha_i + \mu_t + (\beta + \Gamma Z_{it}) ln(y_{it}) + (\upsilon + \Lambda Z_{it})' q_{it} + \delta' Z_{it} + d_{it} \tag{3}$$

where $(\beta, \upsilon, \delta)$ is a vector of direct effects, and Λ and Γ are matrices with interaction effects to be estimated. As pointed out by the authors, the vector of marginal rates of substitution (MRS) between income and the non-income dimensions of satisfaction will be individual and time-dependent:

$$MRS_{it}^{yq} = y_{it} \frac{\upsilon + \Lambda Z_{it}}{\beta + \Gamma Z_{it}}. \tag{4}$$

An important remark made by Decancq et al. (2015b) is that the preference variation introduced in their model remains limited, because it still requires the assumption that individuals characterized by the same values of the conditioning variables Z_{it} have identical preferences.

Finally, as noted by Benjamin et al. (2014a), the reliability of the marginal rates of substitution estimates obtained from happiness data will depends on the applied proxy of utility. Concluding their analysis of choice rankings over residencies among 561 US students, the authors claim that the MRS derived from evaluative subjective well-being measures (such as life satisfaction and Cantril's Ladder) "imply trade-offs closer to actual choice than does affective happiness, and as close as do multimeasure SWB indices" (p. 3498).

[2]Noise is evaluated in 'Kosten units' (*Ku*) named after a government commission, chaired by the late professor Kosten. In 1967 the Kosten Commission derived a formula, based on the noise in decibels, the frequency of the flights, and a correcting factor for day and night traffic (see Van Praag and Baarsma, 2005, p. 228).

1.3 Happiness and Economic Outcomes

In 1992 Gary Becker received the Nobel Memorial Prize in Economic Sciences for "for having extended the domain of microeconomic analysis to a wide range of human behaviour and interaction, including non-market behaviour".[3] Ten years later the Prize was won not by an economist, but by a psychologist – Daniel Kahneman – who obtained it for "for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty".[4]

The first decision of the Nobel Prize Commission showed that the scope of economic analysis should be broadened with the non-economic aspects of life, while the second one, vice versa, highlighted the importance of including the non-economic factors within the economic analysis. The standard approach in happiness economics integrated "insights from psychological research into economic science" in a twofold manner. First, by using economic outcomes to explain psychological conditions (i.e. happiness as a function of individual income); second, by showing how the utility-income relation is reshaped by psychological factors (i.e. hedonic adaptation and social comparisons). The alternative approach treats psychological well-being as a determinant of the conventional economic outcomes: productivity, income, and employment.

1.3.1 Happiness and Productivity

In their analysis of subjective well-being in the context of implications to public policy, Pavot and Diener (2004, p. 685) note:

> *The pattern is consistent: subjective well-being is associated with good success in the work-place. Happy workers are productive, satisfied workers, and their positive affect is associated with good organizational citizenship, good relations with coworkers, and improved conflict resolution.*

The relation between worker's well-being and productivity has been analysed in different areas of social science. In his excellent review Russell (2008) outlines several earlier contributions from managerial and psychological studies supporting the so-called "happy-productive worker" hypothesis:

- George and Brief (1992) show that individuals with higher subjective well-being are more engaged and involved in their work, earn more money, have better relations with supervisors and coworkers, and are better organizational citizens[5];
- Staw et al. (1994) report that employees experiencing higher dispositional positive affect receive higher pay and higher supervisor ratings;
- Spector (1997) notes that employees reporting higher satisfaction with life and their jobs are also more cooperative and more helpful to their colleagues, are more punctual and time efficient, show up for more days of work, and stay with a company longer than dissatisfied employees;

[3] http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1992/

[4] http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2002/

[5] Organisational citizenship behaviour is a person's voluntary commitment within an organization or company that is not part of his or her contractual tasks (see Smith et al., 1983).

- Keyes and Ryff (1998) explain that subjective well-being is related to civic responsibility, the provision of emotional and material supports to more people, high levels of "generativity" (intergenerational transmission of skills and resources), and local community involvement and volunteering. In consequence, one should expect that individuals with higher subjective well-being will be more likely to serve as mentors or coaches to share their wisdom with others;
- Côté (1999) finds that positive affect leads to better performance and good performance leads to positive affect;
- Judge et al. (2001) suggest a positive relationship between job satisfaction and job performance, underlining the crucial role of satisfaction with one's supervisor;
- Wright and Bonett (1997), Wright and Cropanzano (2000), Cropanzano and Wright (2001) and Wright et al. (2002) provide evidence that employees who report experiencing a greater balance of positive emotional symptoms over negative emotional symptoms, receive higher performance ratings from supervisors than employees who report feeling more negative than positive symptoms of emotion;
- Harter and Schmidt (2000) and Harter et al. (2003) claim that companies with the most employees with high levels of well-being report dramatically higher monetary returns than companies in the lowest quartile of employee well-being;
- Keyes et al. (2000), Harter and Schmidt (2000) and Harter et al. (2003) point out that businesses with more employees who have high levels of employee well-being also tend to report greater customer satisfaction and loyalty, greater profitability, more productivity, and lower rates of turnover;
- Harter et al. (2002) and Clifton and Harter (2003) hypothesise that managers who create environments in which employees are able to make the most of their talents have more productive work units with less employee turnover;
- Harter et al. (2003) conclude that employee engagement (i.e. a combination of cognitive and emotional antecedent variables in the workplace) generates higher frequency of positive affect (e.g. job satisfaction, commitment, joy, fulfilment, interest, caring), which then relates to employee retention, work performance, creativity, and ultimately business outcomes.

A critical remark to the results coming from the happy-productive worker line of research has been proposed by Lucas and Diener (2003). The authors emphasize that, even though happier individuals are more sociable, active, self-confident, healthier, more creative, and more likely to use quick and efficient strategies for processing information – the specific impact of these factors on worker's productivity will depend on the nature of the worker's task. As an example, they point out that "happy workers may be creative and efficient when performing complicated tasks, but this creativity and efficiency may come at the expense of caution and vigilance" (p. 51).

More recent psychological studies on the happiness-productivity relationship apply more sophisticated measures of subjective well-being and more developed methodologies. In order to allow for distinguishing between happiness as a *trait* and happiness as a *state*, Zelenski et al. (2008) introduce: multiple measures of happiness, repeated measures (experience sampling),

and prospective measures. In their study of 75 directors employed in the private sector and the Canadian federal government, they find out that happiness may indeed foster productivity: i. happy workers are productive workers (trait level of analysis); ii. workers are more productive when in happy moods (state level of analysis).

Tsai et al. (2007) investigate 306 sales agents and their immediate supervisors from five insurance companies in Taiwan and show that "employee positive moods predicted task performance indirectly through both interpersonal (helping other coworkers and coworker helping and support) and motivational (self-efficacy and task persistence) processes" (p. 1570). In their study of 134 participants from a clinical laboratory and from a federal court of justice in Brazil, Fogaça and Junior (2016) analyse the standard relationship between well-being and productivity considering also the moderating effect of the organizational structure. The results show that components of the organizational structure "positively enhance the relationship among well-being at work, job satisfaction, and individual job performance" (p. 156).

Boehm and Lyubomirsky (2008) review the literature in support of the view that differences in individual happiness explain why some workers are more successful than others. The outlined results come from different methodological frameworks and answer different questions: i. cross-sectional evidence (do happy people engage in successful behaviours?); ii. longitudinal evidence (does happiness precede success in the workplace?); ii. experimental evidence (does happiness lead to success in the workplace?). The authors emphasize that the first two approaches do not resolve the issue of causality, while the shortcoming of the third approach is the sample size and the inability of concluding general statements.

The lack of generalizability is tackled by Di Maria et al. (2014), who analyse the happiness-productivity relation on cross-country level. Using the European Social Survey and AMECO data for 20 European countries they: first, establish whether subjective well-being can be a candidate variable to study total factor productivity; second, adopt data envelopment analysis (DEA) to compute total factor productivity and efficiency indices. Their results indicate that subjective well-being is an input and not an output to production.

Finally, in their most recent contribution to the happy-worker literature, Oswald and Proto (2015) provide a clear evidence of the existence of a causal link between human well-being and human performance. The authors show that happiness may be treated as an argument of the individual production function. In their study, a group of randomly selected participants is exposed to different types of short-run happiness shocks (e.g. watching a short happiness video clip; receiving chocolate, fruit or drink). Importantly, the impact of these shocks on happiness has been confirmed by the participant's answers to subjective well-being questions asked before and after the treatment. Next, all the participants (including the control group) carry out various tasks measuring their productivity (e.g. timed mathematical additions), being paid for the correct solutions. The results show that the treated individuals have approximately 12% greater productivity.

The authors perform also an experiment designed to study the productivity effects of major real-world shocks, such as bereavement and family illness. They show that lower happiness caused by bad life events is systematically associated with lower productivity. The results obtained by Oswald and Proto (2015) go in line with the views coming behavioural studies:

i. current emotional state has a significant effect on decision making, problem solving, and behaviour (Hermalin and Isen, 2008); ii. unhappiness may lead to a lack of mental concentration (Killingsworth and Gilbert, 2010).

1.3.2 Happiness, Wages and the Labour Market

The positive impact of happiness on productivity offers an explanation why some other key economic outcomes may be determined by individual well-being. According to the neoclassical approach, the value of the marginal product of labour is equal to the wage at the profit maximizing level of employment (see Krugman and Wells, 2013, p. 536). In other words, worker's productivity strictly determines his or her earnings. What fallows, happiness, as a determinant of productivity, becomes in a natural way also a determinant of wage.

Several longitudinal studies showed that subjective well-being should be considered as a predictor of income. Marks and Fleming (1999) analyse the Australian Youth in Transition panel data showing that, for several different adult cohorts, well-being increases in the preceding periods were related to future increases in earnings, as well as to lower chances of being unemployed.

In another study, Diener et al. (2002) survey more than 7,000 students to assess the influence of dispositional affect (defined as self-rated cheerfulness at college entry) on their economic outcomes in future. Nineteen years after the survey, the same participants reported their incomes: cheerful students declared to earn more money in their thirties compared to their less cheerful counterparts. Additionally, they also had higher job satisfaction rating and were less likely ever to have been unemployed. These results emphasize that happier people are expected to acquire greater wealth across their lifetimes.

In a more recent contribution, De Neve and Oswald (2012) employ data from a large US representative panel study (with around 11,000 individuals), showing that adolescents and young adults who report higher life satisfaction or positive affect, grow up to earn significantly higher levels of income later in life. Importantly, by introducing family fixed characteristics, the authors show that the results hold even after controlling for the sibling effects. Moreover, De Neve and Oswald (2012) identify the decisive factors shaping the impact of psychological well-being on earrings. The mediators which carry the influence from happiness to income are: i. higher probability of obtaining a college degree and getting hired or promoted; ii. having greater degrees of optimism and extraversion, as well as experiencing lower levels of neuroticism.

Using two waves of the Russia Longitudinal Monitoring Survey (RLMS, covering more than 5,000 observations), Graham et al. (2004) find that people who had higher "residual happiness" in 1995 had higher earnings and were in better health in a survey 5 years later. "Residual happiness" means happiness levels that are not explained by the usual determinants of well-being (income, education, socio-demographic characteristics). Therefore, the obtained results show that happiness – independently from the current level of earnings – acts as a predictor of earnings in future periods. To explain their results, Graham et al. (2004, p. 336) conclude with the following words: "It is certainly plausible that the same positive cognitive biases such as self-esteem, control, and optimism that affect normal happiness levels may also have positive effects on people's performance in the labour market".

Indeed, numerous psychological studies emphasized the role of emotional well-being in explaining the success in employment. Burger and Caldwell (2000) demonstrate that even before finding a job, a happier person is more likely to be invited to a job interview. The study of college students showed that the higher the positive affect prior to graduation, the greater the probability of receiving a job interview three months later. In this manner, positive emotions turn out to be a distinct advantage when searching for a job. In addition, compared to less happy peers, happy individuals are less likely to lose their jobs (Diener et al., 2002) and more likely to find a new job when unemployed (Marks and Fleming, 1999).

In an interesting contribution to the happiness-employment debate, Lucas et al. (2004) study 24,000 German citizens in a 15-year time span showing that a significant drop in life satisfaction is observed already two years prior to the job loss. This result highlights the predicting role of subjective well-being in understanding economic behaviour and its explanation is twofold: i. as unhappiness causes lower performance at work, it may lead to a job loss; ii. unhappiness, caused by job dissatisfaction, may force a job change decision.

Another work supporting the influence of psychological well-being on economic outcomes demonstrates that happiness play an important role in finding reemployment. Krause (2013) examines the job search results of 2,500 unemployed Germans and finds a "significant inverted U-shaped effect of residual happiness on an unemployed individual's future reemployment probability and re-entry wage, even after controlling for demographic and socio-economic characteristics, labour market histories and future job prospects" (p. 1). An additional finding is that individual happiness turns out to be a strong predictor for exit from unemployment into self-employment rather than regular employment.

An extra evidence coming from Germany (1994–2007 SOEP data) is provided by Gielen and Ours (2014), who show that nearly half of the unemployed do not experience a drop in happiness after a job loss, while the unemployed who experience the drop search more actively for a job, but it does not speed up their job finding.

Two earlier works using data from the British Household Panel Survey (BHPS) – Clark (2003) and Mavridis (2010) – examine how a decrease in mental well-being (measured with the General Health Questionnaire score) influences the likelihood of future unemployment. The results from both studies indicate that people experiencing greater drops in well-being upon becoming unemployed have a lower probability of remaining unemployed one year later.

Finally, in the most recent and complex contribution, O'Connor (2016) combines data from the US General Social Survey Panel (GSS, 2006-2014) and German Socio-Economic Panel (GSOEP, 1984-2013) to show that happier people are less likely to be unemployed, whereas this relation is most likely to be causal: i. it holds in an instrumental variable setting; ii. it is additionally confirmed in the residual happiness framework (previously applied in Graham et al., 2004; Krause, 2013). As explained by the author, even though the residual-based analysis does not provide a clear evidence of causality, it is difficult to indicate any omitted channels or alternative sources of bias: "Identification comes from time-varying shocks to SWB [subjective well-being], excluding the effects of individuals' job satisfaction, job expectations, unemployment history, family income, industry and occupation, social networks, and self-reported health" (p. 30). The results show that, after controlling for the above-mentioned characteristics, a one

standard deviation improvement in residual SWB is related to more than a one-percentage point drop in the probability of being unemployed in the US and 0.3-percentage points in Germany. The effects are partly explained by the role of "character skills", typically assessed with personality traits.[6] O'Connor (2016) demonstrates additionally that improvements in an individual's character skills (e.g. reduced neuroticism) are correlated with increased residual SWB in a fixed-effects regression. Finally, the results reveal as well that residual SWB is comparable to cognitive ability in explaining wages.

In conclusion, the outlined panel studies on representative samples constitute a robust evidence for the causal link between subjective well-being and economic outcomes. Indeed, economics of happiness – with its findings on productivity, wages and employment – provided an innovative contribution to labour economics.

1.3.3 Economics of Personality Traits

Boyce (2010) demonstrates that when explaining subjective well-being, personality traits account for roughly 20% of the unobserved heterogeneity across individuals. Therefore, in order to fully understand the impact of happiness on economic outcomes, it is necessarily to assess the role of individual differences in personality.

In psychology, and recently also in economics, personality is assessed through the Big-Five traits defined as follows (Becker et al., 2012):

1. **Openness**: individual differences in the tendency to be open to new aesthetic, cultural, and intellectual experiences;
2. **Conscientiousness**: the tendency to be organized, responsible, and hardworking; located at one end of a dimension of individual differences (conscientiousness versus lack of direction);
3. **Extroversion**: an orientation of one's interests and energies toward the outer world of people and things rather than the inner world of subjective experience; it includes the qualities of being outgoing, gregarious, sociable, and openly expressive;
4. **Agreeableness**: the tendency to act in a cooperative, unselfish manner; located at one end of a dimension of individual differences (agreeableness versus disagreeableness);
5. **Neuroticism**: a chronic level of emotional instability and proneness to psychological distress.[7]

Mueller and Plug (2006) find that openness and conscientiousness are likely to be rewarded in the labour market, while agreeableness and neuroticism are likely to be penalised with lower wages. Nyhus and Pons (2005) arrive at similar conclusions additionally showing that what is also important for earnings is the individual's degree of control. Groves (2005) shows that

[6] Character skills are defined as "personality traits, goals, motivations, and preferences that are valued in the labour market, in school, and in many other domains" (Heckman and Kautz, 2013, p. 1).

[7] For example, in the German Socio-Economic Panel, the the Big-Five personality traits are assessed through answers to the question "I see my self as someone who..." (for each trait there are 3 questions): (1.) "...is original, comes up with new ideas / values artistic experiences / has an active imagination" (*openness to experience*); (2.) "...does a thorough job / does things effectively and efficiently / tends to be lazy (reversed)" (*conscientiousness*); (3.) "...is communicative, talkative / is outgoing, sociable / is reserved (reversed)" (*extroversion*); (4.) "...is sometimes somewhat rude to others (reversed) / has a forgiving nature / is considerate and kind to others" (*agreeableness*); (5.) "... worries a lot / gets nervous easily / is relaxed, handles stress well (reversed)" (*neuroticism*). For details see Heineck and Anger (2010).

psychological traits, such as autonomy, social withdrawal and aggression play an important role in determining female earnings. Borghans et al. (2008) note that personality measures offer a considerable benefit to designing motivation schemes for employees. They claim that economic incentives might influence individuals differently according to the differences in personality. Furthermore, Uysal and Pohlmeier (2011) reveal that conscientiousness and neuroticism have a significant effect on the instantaneous likelihood of finding a job, where the former has a positive impact and the latter has a negative impact.

Heckman and Kautz (2013) review the literature on cognitive and non-cognitive skills proposing to consider personality traits as components of human capital in equations explaining wage and job search outcomes. The authors use an alternative name for what was previously described as personality traits – character skills. "Character is a skill, not a trait. At any age, character skills are stable across different tasks, but skills can change over the life cycle. Character is shaped by families, schools, and social environments. Skill development is a dynamic process, in which the early years lay the foundation for successful investment in later years" (p. 1).

Importantly for economists and policy makers, as explained in the above quote, the psychological traits influencing economic outcomes are not necessarily stable across lifetime and turn out to be variable depending on external circumstances. In his analysis, O'Connor (2016) explains that personality traits do vary across time and are significantly related with residual happiness. What is crucial, his main result – happier people are less likely to be unemployed – holds after controlling for fixed effects and the Big-Five personality traits, suggesting that what explains the probability of being unemployed are the individual differences in residual subjective well-being.

Additional evidence on the variability of personality traits comes from more recent contributions. Boyce et al. (2013) examine changes in personality of 8,600 individuals surveyed in two waves of the Household, Income and Labour Dynamics in Australia (HILDA). Their results are striking: "personality varies at least as much as socio-economic factors that are typically considered as variable, such as income, unemployment and marital status", while these variations are a strong predictor of changes in life satisfaction (p. 302). The researchers emphasize that the findings may help inform policy debate over how best to help individuals and nations improve their well-being. Another work identifies those life events which have the strongest impact on personality. Boyce et al. (2015) analyse how personal characteristics may alter after becoming unemployed. They investigate data for 6,700 German adults using a latent change model and find significant personality changes following a job loss. The results are consistent with the view that personality is shaped by contextual and environmental factors, suggesting that "public policy can play a key role in enabling psychological growth" (p. 1007).

Importantly, Heckman and Kautz (2013) describe in detail numerous examples of interventions from different parts of the world showing that character skills can be fostered. They start with early-life interventions that begin before formal schooling, going through education in kindergarten and elementary school, interventions targeted toward adolescents and young adults, as well as apprenticeship programs for workers, finishing at interventions applied to multiple age groups.

Having explained that person's character is not likely to remain unchanged throughout life, it will be important to determine the role of personality traits in reshaping the relation between utility and income.

Boyce et al. (2010b) analyse the role of conscientiousness in explaining the well-being decrease following a negative income shock due to job loss. In a longitudinal study of 9,000 respondents interviewed yearly, they document that after 3 years of unemployment individuals high in conscientiousness (i.e. one standard deviation above the mean) experience a 120% higher decrease in life satisfaction than those at low levels. These findings emphasize that conscientiousness, typically having a positive impact on well-being, could turn out detrimental when failure is experienced.

Another example of how psychological factors reshape the well-established microeconomic patterns is provided by Boyce and Wood (2011). In their study of more than 13,000 German adults over 4-years, they demonstrate that marginal utility of money changes with personality: individuals with higher levels of conscientiousness obtain more satisfaction to their lives from increases to their household income. Similar analysis is performed by Soto and Luhmann (2013). They use data from three different large-sample longitudinal studies (BHPS, GSOEP, HILDA) to show that neuroticism consistently moderates the effects of both stable between-person income differences and within-person income fluctuations on life satisfaction. In this way, highly neurotic individuals are characterized by: i. stronger reactions to negative consumption experiences associated with lower individual income; ii. greater vulnerability to unfavourable income comparisons (with their own past and with others).

Furthermore, Proto and Rustichini (2015) offer a novelty and introduce a quadratic specification in the model linking individual income to life satisfaction. Using data from GSOEP and BHPS they find out that neuroticism increases the usually observed concavity of the happiness-income relationship. In particular, more neurotic individuals enjoy extra income more if they are poorer, and enjoy extra income less if they are richer. The interpretation of the result is based on Prospect Theory (Kahneman and Tversky, 1979): utility (subjective well-being) is dependent on the gap between aspired and actual income, while, according to Proto and Rustichini (2015), this relation is moderated by neuroticism.

Finally, Friehe et al. (2014) employ data from the 2008–2010 pretest modules from GSOEP to determine which individual characteristics are related to strong positional income concerns.[8] The researchers provide evidence of a statistically significant link between personality and declared importance of income comparisons. They first show that individuals reporting greater importance of income comparisons are less satisfied with their lives (controlling for income and socio-demographic characteristics). Then they estimate a negative association of comparison intensity with agreeableness, meaning that individuals characterized by the "tendency to act in a cooperative, unselfish manner" are considerably less concerned about positional competition with others. What is more, they find that positional income concerns are weaker in case

[8] As a measure of positional income concerns, Friehe et al. (2014) use direct questions on importance of comparisons with others: "How important is it to you how your gross income compares to that of... neighbour/friends/colleagues/etc."). The answer is assigned with a numerical value (called 'comparison intensity') and may vary from "1: completely unimportant" to "7: extremely important". Declared importance of income comparisons has been previously studied by Clark and Senik (2010), who showed that it is negatively related to happiness, life satisfaction, and job satisfaction, and positively related to the frequency of feeling depressed.

individuals with strong preferences towards fairness.

1.4 The Role of Social Capital

1.4.1 Social Capital and Economic Outcomes

Personal characteristics are strongly linked to subjective well-being (Boyce, 2010) and vary throughout lifetime (O'Connor, 2016), as they may be influenced by economic circumstances such as negative income shocks caused by unemployment (Boyce et al., 2015). Importantly, individual personality, also called character skills, evolves in the social environment and may be shaped by policies and interventions at different stages of life (Heckman and Kautz, 2013).

Now, looking at personality traits from a perspective of human interactions, it is crucial to note that they are expected to determine one's behaviour towards others and, vice versa, affect the behaviour of others towards an individual. In this way, what is defined as *individual* characteristics should be also considered in a broader sense as a *societal* concept. Some of the Big-Five personality traits, such as openness and agreeableness, are strictly connected to an individual's life goals and values (Olver and Mooradian, 2003) as well as may determine cooperative behaviour in a group (George, 1990; Matzler et al., 2011, 2008).

Similarly to other non-economic features of life (often referred to as "forms of capital"), for instance, education and health (human capital) or environment (natural capital), also social interactions may be perceived to have a *value* in economic terms. As observed by Arrow (1972, p. 357): "Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence." According to Putnam (2000, 2001), interpersonal connections provide specific benefits which create a value for the people who are connected, and for bystanders as well. The collective value of social networks – trust, reciprocity, cooperation – has been defined as another form of capital, i.e. social capital.

Social capital is typically assessed with: involvement in community and organizational life, public engagement and volunteering, informal sociability, and reported levels of interpersonal trust (Inkeles, 2000; Lang and Hornburg, 1998; Lochner et al., 1999; OECD, 2001; Onyx and Bullen, 2000; Putnam, 2000). In his earlier work, Putnam (1993) explains why sociologists needed to use the economic nomenclature in order to define a societal concept:

> *Stocks of social capital, such as trust, norms, and networks, tend to be self-reinforcing and cumulative. Successful collaboration in one endeavour builds connections and trust – social assets that facilitate future collaboration in other, unrelated tasks. As with conventional capital, those who have social capital tend to accumulate more – them as has, gets. Social capital is what the social philosopher Albert O. Hirschman calls a "moral resource", that is, a resource whose supply increases rather than decreases through use and which (unlike physical capital) becomes depleted if not used.*[9]

[9]See also Glaeser et al. (2002) for explanation how standard optimal investment model can be used to analyse an individual's decision to accumulate social capital.

What is of particular interest, social capital may be used as a predictor of economic behaviour. Heinz and Schumacher (2015) design an experiment to examine the link between pro-social behaviours (i.e. volunteering and local participation) and free-riding in teamwork situations. They find that contributions in a public goods game strongly increase in a subject's degree of social engagement as indicated on her résumé (and rated by an independent third party). Ferrer-i-Carbonell and Gërxhani (2016) find that evading taxes is negatively associated with individuals' life satisfaction, while this relationship is shaped by a high level of social capital. In particular, "while associational engagement (i.e. formal social capital) has a crucial role to the younger generation in the way they experience the relationship between evading tax and how satisfied they are with their life, for the older generation it is their social networks (i.e. informal social capital) that shape this relationship".

Researchers provided numerous reasons to argue that cooperation, social engagement, and interpersonal trust may foster economic growth. These forms of attitudes and behaviours reduce incentives for free-riding and moral hazard; facilitate efficient use of resources (by lowering transaction costs); help solving collective action problems; as well as attenuate the principal-agent problem (Arrow, 1972; Beugelsdijk et al., 2004; Bowles and Gintis, 2002; Chou, 2006; Helliwell and Putnam, 1995; Knack and Keefer, 1997; Narayan and Pritchett, 1999; Zak and Knack, 2001).

Using the framework of a modified neo-classical model of economic growth, Whiteley (2000) studies the relationship between social capital (measured with social trust) and GDP in a sample of 34 countries over the period 1970-1992. The results suggest that "social capital has an impact on growth which is at least as strong as that of human capital or education" (p. 443). Additional evidence emphasizing the role of social capital in determining economic performance comes from business science. Cooperative behaviour and trust in others have been found to induce a positive effect on developing the entrepreneurial opportunities (Chen and Wang, 2008; De Carolis and Saparito, 2006; Liñán and Santos, 2007).

1.4.2 Social Capital and Well-Being

Social capital is a valuable asset for the society not only because of its economic significance – it also plays a role in determining *objective* well-being (see Hawe and Shiell, 2000; Lomas, 1998; Smelser et al., 2001, for a review of studies demonstrating positive impact of social capital on health). Earlier theoretical contributions emphasizing that social networks – with their supportive and buffering function – may positively affect individuals' physical and mental health (Berkman, 1986; Cohen and Wills, 1985; Seeman, 1996) have been confirmed by large-sample cross-country empirical evidence (Carpiano, 2007; Ichida et al., 2009; Mansyur et al., 2008).

Social capital turns out to be a decisive factor also when it comes to *subjective* well-being (Bartolini et al., 2013b; Bjørnskov, 2008; Helliwell, 2006; Helliwell and Putnam, 2004; Ram, 2010; Sarracino, 2010, 2012). Using data from the World Value Survey (WVS) from more than 80 countries, Sarracino (2013) shows that proxies of social capital (trust, volunteering, time spent with friends) have a similar, positive impact on happiness in developed and developing economies. Bartolini and Bilancini (2010) employ the US cross-sectional data (GSS,

1975–2004), cross-country time series (WVS, 1980–2005), and German panel data (GSOEP, 1996–2007), in order to show that sociability (i.e. the quality and quantity of social relationships) is a significant determinant of subjective well-being at both the within-country and the worldwide level. Moreover, Bartolini and Sarracino (2014) estimate trends of social trust and group membership in multiple cross-country databases to conclude that, compared to economic growth, social capital is a better predictor of changes in happiness.

What is particularly important to economists and policy makers, growing number of evidence on the link between social capital and happiness tackles the issue of endogeneity and reverse causality. If social relationships positively affect subjective well-being, it is reasonable to expect also that, by means of being more open and extrovert, happier individuals will engage more in social life of their communities and will be more trustful. Applying data from 21 waves of GSOEP and using GMM panel VAR system with Granger causality test, Becchetti et al. (2008) demonstrate that the causal link holds in both directions, meaning that happiness and sociability reinforce one another. In consequence, people with a more intense relational life are not only happier, but also are less likely to be affected by a "relational poverty trap" (i.e. poor relations causing unhappiness, which later results in even poorer relations, etc.).

Becchetti et al. (2012) assume the existence of a complex nexus between income, social relationships and subjective well-being. They use data for more than 100,000 individuals from 82 countries to estimate simultaneous equations and find out that time spent for relationships has a significant and positive impact on happiness, while more productive individuals may substitute worked hours with the non-working time made free for enjoying relationships, when they have strong preferences for them.

Furthermore, the issue of endogeneity has been also dealt with by the application of instrumental variable setting. Becchetti et al. (2011) create a relational time index (time devoted to social gatherings, cultural events, and volunteer work) and implement it as an instrumented variable into a happiness regression with individual fixed effects. They establish a positive and significant effect of relational time on life satisfaction. Finally, Becchetti et al. (2016) examine data coming from the Survey of Health, Ageing and Retirement in Europe (SHARE) for around 30,000 individuals. They document that that voluntary work, religious attendance, helping friends/neighbours and participation in community-related organisations, affect life satisfaction positively and significantly. Their results are confirmed in "robustness checks including refinements of the dependent variable, instrumental variables and sensitivity analysis on departures from the exogeneity assumption" (p. 1).

Apart from having direct positive effect on happiness, social capital may also influence individual well-being indirectly. In their analysis of the of role social capital during economic crisis, Helliwell et al. (2014) "present evidence, from the transition countries of Europe, of the power of social trust, seen here as an indicator of the quality of a country's social capital, to increase happiness directly, and to permit a softer landing in the face of external economic shocks" (p. 161).

The second indirect channel is explained by how social capital is linked to individual values affecting happiness and shaping the happiness-income relation. Uncooperative behaviour and strong preference for competition are strictly related to individualistic and materialistic values

(McHoskey, 1999; Rahn and Transue, 1998), whereas the latter are negatively associated with subjective well-being (Ryan and Dziurawiec, 2001). In this manner, materialism may be a source of relational poverty, leading to loneliness and unhappiness (Kasser, 2002).

A natural consequence of materialism, i.e. high concern for individual income and material goods, is an elevated importance of income comparisons with others (Chan and Prendergast, 2007; Heaney et al., 2005). Materialistic values may therefore be an engine of positional competition – a behaviour which from the welfare perspective is a waste of resources (Frank, 2005): if individual's utility/happiness is largely affected not by absolute levels of consumption, but by relative levels, he or she has will not benefit from consuming more if others also consume more. Importantly, intensity of income comparisons has been shown to be negatively correlated with some of the Big-Five personality traits (Friehe et al., 2014). One of the correlates is agreeableness, defined as the tendency to act in a cooperative, unselfish manner. This fact shows that elevated concerns for positional competition and low priority of pro-social behaviours are interrelated. Social capital may also moderate the effect of social comparisons on subjective well-being (Bárcena-Martín et al., 2016), but this relation is not yet well-established in the literature.

Correspondingly to the case of character skills, social capital is a strong predictor of happiness (Leung et al., 2013), may vary in time (Sarracino, 2010), as well as can be influenced by economic circumstances, e.g., by negative shocks of GDP (see Eurofound, 2012b; Polavieja, 2013, for the case of the 2008 financial crisis in Europe). Can it be as well shaped by public policies?

Bartolini (2014, p. 597) explains that: "High-income inequality negatively affects well-being, exacerbating income comparisons and damaging social capital. Policies aimed at reducing inequality enhance well-being by reducing social comparisons and fostering social capital".[10] Other examples of social capital policies proposed by the author involve: i. reorganization of urban life, as walkable zones and public spaces are enablers of social interactions; ii. protection of work-life balance, as individual free time is a key social asset; iii. limitation of advertising, as advertisements promote materialistic values and positional competition; iv. reform of schooling system towards education promoting cooperation, creativity, autonomy, as well as incentive schemes based on intrinsic motivation.[11]

Empirical research on policies for social capital confirm the validity of these proposals. Rogers et al. (2011, p. 201) claim that "the generation and maintenance of social capital is another important component of quality of life that may be facilitated by living in a walkable community". Helliwell (2011) designs a prison experiment in which subject participate in lessons from subjective well-being research: the importance of social context, benevolence, trust, building positive outcomes, and top-to-bottom engagement in a shared purpose. The effects of the participation are remarkable: improved staff morale, reduced recidivism, and better social connections between prisons and the rest of society.

Finally, Algan et al. (2013) analyse how teaching practices (such as copying from the board versus working on projects together) are related to various dimensions of social capital. By addressing the issues of omitted variables and reverse causality, the authors show that: "In

[10]Income inequalities (Celse, 2016) as well as inequality of opportunities (Ravazzini and Chávez-Juárez, forthcoming) have been shown to have also a direct negative impact on subjective well-being.

[11]See Bartolini (forthcoming) for details of the social capital policies.

a cross-section of countries, teaching practices are associated with beliefs supporting social capital. In the micro data, across schools within a country, horizontal teaching practices, such as working in groups, are associated with pro-social beliefs, while vertical teaching practices, such as teachers lecturing, are associated with opposite beliefs" (p. 208).

1.5 Happiness and Quality of Life

Should maximizing happiness of citizens be the ultimate goal of public policy? Yes? No? Why?

The discussion around these question has been accompanying the happiness research since its origins. One of the views proposed to use various types of reported well-being on aggregated level to create indicators informing policy makers (Dolan and White, 2007; Graham, 2005b; Kahneman et al., 2004). Such approach has been criticized for its methodological and conceptual issues: i. the assumption of interpersonal comparability of happiness scores and, what is related, the problem of scores aggregation across individuals (Benjamin et al., 2014b); ii. the relative and adaptive nature of well-being, implying that people's happiness is sensitive to social comparisons and may adjust to negative life events (Schokkaert, 2007)[12]; iii. the risk that governments might have an incentive to manipulate the social welfare function (happiness indicator) for political reasons (Frey and Stutzer, 2012).

Decancq and Schokkaert (2016) come up with a more complex measure of well-being. They introduce a two-step aggregation: i. constructing an index of individual well-being; ii. constructing an index of social welfare. Their specific proposal is defined as "equivalent income": "The equivalent income of an individual is the hypothetical income that, if combined with the best possible value on all non-income dimensions, would place the individual in a situation that he/she finds equally good as his/her actual situation" (p. 35). As explained by the authors, equivalent incomes can be operationalized with different techniques, one of which is the subjective satisfaction method.

Another standpoint supports the application of stated preference (reported happiness, satisfaction, etc.) for designing indicators of objective well-being (family life, health, security, etc.) based on relative marginal utilities (Benjamin et al., 2014b).

Interestingly, Frey and Stutzer (2009) postulate that "the appropriate approach is not to maximize aggregate happiness in seeking to improve outcomes by direct policy interventions. The goal of happiness research should rather be to improve the nature of the processes through which individuals can express their preferences. Individuals should become better able to advance their idea of the good life, both individually and collectively" (p. 301). Their argument is linked to the so-called 'capability approach', where 'capability' means "the freedom to achieve various lifestyles" (Sen, 1999, p. 75).[13]

What is important for the debate on subjective well-being indicators, typical measures of capabilities – freedom of choice and the locus of control – are strongly related to life satisfaction (Verme, 2009). Graham and Nikolova (2015) employ longitudinal data from the Gallup World

[12]Schokkaert (2007, p. 427) explains that "the ethically most worrying cases of adaptation refer to examples of social discrimination in which the relative differences in valuation by different groups are imposed by the social structure".

[13]Capability approach has been analysed in earlier works by Sen (1985, 1993) and by Nussbaum (2011). See Anand et al. (2009, 2005); Gasper (2007); Kotan (2010) for reviews and discussions.

Poll (GWP) for 160 countries worldwide, and show that subjective well-being (life evaluations and emotional states) are determined by both, *actual* capabilities and means (education, employment, and income), and *perceived* opportunities (autonomy and health perceptions and belief in hard work).

In 2011, basing on the report published by the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al., 2009), OECD launched the *Better Life Initiative* – a proposal of quality of life indicators bringing together actual capabilities, perceived opportunities, as well as subjective well-being (Durand, 2015). The ten domains of individual well-being proposed by the Initiative are: income and wealth, jobs and opportunities, housing, health status, work and life balance, education and skills, social connections, civic engagement and governance, environmental quality, personal security, and subjective well-being. A very similar set of quality of life (QoL) domains have been also introduced by Eurostat (2015) and many national statistical offices of Europe.

Apparently, all the objective QoL domains from the OECD framework turn out to be distinct correlates of happiness, while SWB itself is the only non-objective domain on the list. In consequence, policies aimed at promoting (objective) quality of life will also improve (subjective) well-being of citizens. And here the question comes back: should governments invest in quality of life components just because they have a positive impact on happiness?

The present literature survey showed that promoting citizens' subjective well-being (for example through policies for social capital) may result in improvements of certain objective life domains. Happier people have better performance at work and are also more efficient in the job search process. What is more, happiness may be a determinant of physical well-being, which is an important indication for health related policies. Importantly for the issue of low fertility rates and ageing societies, individuals who are more satisfied with their lives are also more likely to have children (Cetre et al., 2016).

Originally, reported levels of happiness have been perceived as a measure of utility, or simply as an outcome variable in econometric models. Such perspective naturally raised questions and doubts about using subjective evaluations of life as ultimate indicators for policy makers. The findings presented in this literature review contribute to the debate on happiness and public policy by proposing an alternative approach to subjective well-being: instead of treating is as an outcome variable, it should be considered as an additional factor influencing economic outcomes.

Future research on quality of life should focus not only on identifying the objective and subjective components of well-being (which has been already well-defined), but on assessing the economic and non-economic benefits coming from greater happiness.

2 Eliminating the Negative Effects of Income Comparisons on Well-Being. The Role of Social Capital

> *A house may be large or small; as long as the neighbouring houses are likewise small, it satisfies all social requirement for a residence. But let there arise next to the little house a palace, and the little house shrinks to a hut.*
> – Karl Marx

Abstract

Are unhappiness, high concern for money and scarcity of social capital different faces of the same phenomenon? Economists tend to treat these variables as distinct correlates of well-being. On the contrary, positive psychologists argue that they all relate to materialism, a system of personal values ascribing great importance in life to extrinsic motivations and low priority to intrinsic motivations. Using data from two European cross-sectional surveys and the German Socio-Economic Panel, I test the hypothesis that material interests, proxied by the effects of individual and reference income on well-being, are associated with low levels of social capital. The results suggest that people with scarce social capital tend to have greater material interests, whereas the negative effect of income comparisons on well-being is eliminated for individuals exhibiting the highest levels of social capital. The implication of such finding is that promoting social capital reduces people's material concerns and has positive impact on their well-being. The results from a country-level analysis additionally show that, since social capital moderates the importance of income for well-being on individual level, the well-being gap between income groups is significantly smaller in countries with higher social capital.

2.1 Introduction

Happiness economics has identified various correlates and determinants of subjective well-being[14] (see Dolan et al., 2008; MacKerron, 2012, for reviews). Some of them, for example, inflation rate and unemployment rate, being basically untrended, do not influence the long-run movements in subjective well-being (SWB). Others instead, such as absolute and relative income or social capital, play an important role in explaining the happiness-income paradox defined by Easterlin (1974, 1995). A vast number of empirical tests show that income comparisons are crucial for undermining the possibility of increasing the average happiness by economic growth (Clark et al., 2008). Furthermore, the most relevant examples of the Easterlin paradox can be additionally explained by the decline of social capital. That is to say, in the most spectacular cases of growing economies throughout the last decades, both, in developed countries such as the USA (Bartolini et al., 2013a) and in developing ones, for instance in China (Bartolini and Sarracino, 2015), the negative changes in happiness are associated with the decreasing indicators of trust and civicness. What those countries have in common is the fact that the SWB trend is predicted by two social factors: the erosion of social capital and the strong role of social comparisons. Moreover, Bartolini and Sarracino (2014) show that, in a representative international sample, average well-being in the long run is more likely to grow in countries where social capital grows than in countries where the economy grows.

All these factors – individual income, income comparisons and social capital – are usually analysed separately in happiness economics; however, according to positive psychologists, they are all related to the same phenomenon called "materialism". Positive psychologists define it as a system of personal values ascribing higher importance in life to extrinsic motivations and lower to intrinsic motivations. The distinction between these two types of motivation refers to the instrumentality, or lack thereof, of the reason for doing something. The term "extrinsic" stands for motivations that are external to an activity (for example, money or other material rewards). Conversely, "one is said to be intrinsically motivated to perform an activity when one receives no apparent reward except the activity itself" (Deci, 1971, p. 105). For instance, an individual can decide to work because he or she finds a given job interesting (intrinsic motivation) or because it will bring him or her a certain remuneration (extrinsic motivation). In short, materialistic persons tend to attribute an elevated priority to life goals such as money, luxury consumer's goods, success or high economic position, and a lower priority to human relationships, affection, solidarity, civic engagement or – more generally – to pro-social behaviours.

The literature analysed materialism in many quantitative studies using distinct population samples. Using various methods these works quantify the levels of materialism in individuals in order to relate it to different psychological outcomes. The main finding of these studies is that materialism is associated with a poorer quality of relationships with others. This negative relation is a consequence of relational attitudes developed by individuals with materialistic inclinations. Especially unfavourable for having decent social relationships is the tendency

[14]Diener (2006, p. 399) defines 'subjective well-being' as "all of the various types of evaluations, both positive and negative, that people make of their lives". Following many benchmark studies (e.g. Easterlin, 2003; Frey and Stutzer, 2000), I will use terms 'life satisfaction' and 'happiness' interchangeably as two most common indicators of subjective well-being.

to consider people as objects. An individual who tends to "objectify" others not only lacks generosity, empathy, and cooperative capacity, but also exhibits higher level of cynicism and mistrust, which then becomes an obstacle for building genuine relationships. (Belk, 1985; Cohen and Cohen, 1996; Kasser, 2002; Kasser et al., 1995; Kasser and Sheldon, 2000; McHoskey, 1999; Sheldon et al., 2000). In this view materialism is a cause of relational poverty, however, the opposite direction of causality is plausible as well. The scarcity of emotional relationship with one's parents during infancy leads to greater importance of material concerns in adult life. It is, in fact, lack of affection that causes an individual to feel insecure, while materialism is an answer to insecurity (Cohen and Cohen, 1996; Kasser et al., 1995; Kasser and Sheldon, 2000; Williams et al., 2000). The message coming from positive psychologists is that materialism and relational poverty affect each other resulting in a vicious circle.

The research question posed in this chapter is then the following: is it true that high interest for money and scarcity of social capital are associated with each other? If yes, social capital should be a factor which decreases the importance of money in one's life, whereas a lower importance of individual income should also mean a lower importance of income comparisons. I respond the question using the strength of the relationship between subjective well-being and (i) individual income as a proxy of interest for own money; (ii) income of the reference group as a proxy of interest for others' money. As measures of social capital I employ survey questions focused on the quality of social relationships (e.g. frequency of meeting friends, trust in others). To test whether the two phenomena are related to each other, I integrate them within interaction terms introduced into the standard happiness equation. The conclusion is that psychologist are right: attachment to money and low social capital are two faces of the same phenomenon. Individuals with better social relationships attach lower importance to their own income and are less affected by income comparisons, whereas at the highest levels of social capital the negative effect of income comparisons is eliminated and the positive effect of individual income is maintained. An implication of this result is the following: if higher social capital moderates the negative impact of income comparisons on subjective well-being, it should be perceived as a condition for economic growth being followed by happiness growth.

The remainder of the chapter is organised as follows. Section 2.2 provides background for the study reviewing the literature. Section 2.3 presents the evidence from cross-section; it firsts describes the data and methodology (section 2.3.1), next it presents the results from the primary sample of individuals (main result and causality analysis in section 2.3.2), from an alternative sample of individuals (section 2.3.3), and from a country-level analysis (section 2.3.4). Section 2.4 applies panel data in order to control for individual fixed effects (section 2.4.1) and to analyse the impact of social capital changes on the importance of income for well-being (section 2.4.2). Section 2.5 concludes providing discussion and potential policy implications.

2.2 Background

The investigation of the relationship between utility and money is as old as the economic science, however, the importance of relative income and relative consumption for well-being has been underlined gradually. Two early contribution were made by Veblen (1899) with his conspicuous consumption and the so-called "Veblen effects", and by Duesenberry (1949) who

proposed the relative income hypothesis explaining that individual's consumption and saving behaviour is determined more by his income in relation to others than by its absolute values. In sociology, the same intuition behind the relativity of well-being components was defined by Festinger (1954) as the "social comparison process", and by Runciman (1966) who introduced the notion of "relative deprivation".

Social comparisons were proposed by Easterlin (1974) as an explanation to his happiness-income paradox: even though income is positively correlated with happiness in a cross section, increasing GDP per capita does not lead to an increase in average level of subjective well-being. It is because what matters for happiness is income in relative terms, that is to say, people compare their income to what others earn whereas increasing the income of all will improve the relative position of no one. More generally, "as a person's income (consumption) increases relative to his income standard, so does his SWB. The higher the person's income is relative to the standard (or norm), the greater his happiness. As the economy grows, so do income standards, and this rise in standards acts to deflate the effect of the increased income." (McBride, 2001, p. 254)

More recent empirical studies tend to confirm the relevance of income comparisons for individual well-being. Clark and Oswald (1996) document that, in a representative sample from the BHPS, reported satisfaction levels of British workers are inversely related to their comparison wage rates. Ferrer-i-Carbonell (2005) uses the data from the German SOEP to show that individual happiness is affected by the income of the reference group about as importantly as by the own income, and that people are the more satisfied with their lives the higher their income is compared to the income of the reference group. Additional evidence supporting the hypothesis that relative income significantly affects individual assessments of SWB comes from cross-sectional studies on the American GSS data (McBride, 2001) and international samples from the European Social Survey (Caporale et al., 2009).

Furthermore, position on the income ladder turns out to be as important for SWB as income expressed in absolute terms. Using a representative sample of British workers, Brown et al. (2008) show that the level of well-being (measured with different components of job satisfaction, including satisfaction with pay) depends on the ordinal rank of an individual's wage within a comparison group rather than on absolute wage or average wage in the workplace. Boyce et al. (2010a) find evidence within the BHPS data that income rank explains significantly more of the overall variation in life satisfaction than absolute income, whereas their result holds after introducing various reference groups. Finally, Carlsson et al. (2007) provide an experimental proof confirming the importance of relative income and relative consumption for people's utility, while Fliessbach et al. (2007) show that social comparisons affect reward-related brain activity, which constitutes a neurophysiological proof of the existence of relative income concerns.

More evidence comes from studies analysing the direct link between the importance of income comparisons and individual well-being. Clark and Senik (2010), using a sample of workers from the European Social Survey 2006, find out that there is a negative and significant correlation between the "declared comparison intensity"[15] and various measures of SWB: overall

[15] As a measure of income comparison intensity Clark and Senik (2010) use a direct question "How important is to you compare your income with other people's income?", with answers on a 0-6 scale ranging from "Not important at all" to "Very important".

life satisfaction, happiness, job satisfaction, and satisfaction with pay. What is particularly important for the present analysis, the authors note that individuals reporting to meet socially more often attach less importance to income comparisons; however, the link between social capital and importance of relative income is not further investigated as it lies beyond the scope of their study. Recently, Goerke and Pannenberg (2015) apply novel German data on self-reported income comparison intensity to show that positional concerns are negatively related to individual life satisfaction. Additonally, Clark et al. (2015) provide evidence from Japan using hypothetical discrete choice experiments in which respondents choose between alternative combinations of income amounts, both for themselves and certain reference group. They observe that individuals with strong positional concerns (i.e. those who prefer to earn less in absolute terms but more than the reference group) report lower income satisfaction.

The second line of happiness studies proposes an alternative explanation to the happiness-income paradox. The "negative endogenous growth" approach suggests that the economy tends to grow faster when individuals become relatively poorer in social relationships. In other words, the erosion of social ties can actually "feed" the economic growth as firms, facing a decline in honesty, trust, and work ethics, have to invest more in defensive expenditures, control mechanisms, and guard labour (Bartolini and Bonatti, 2002, 2003, 2008). Furthermore, recent empirical findings demonstrate that the positive effect of income on happiness may be offset by lower consumption of the so-called relational goods (Becchetti et al., 2011; Bruni and Stanca, 2008). Becchetti et al. (2008, 2012) show that relational goods, defined as "affective and expressive, non instrumental, side of interpersonal relationships" (measured, e.g., with the frequency of attendance at social gatherings) have a positive effect on life satisfaction, controlling for unobserved individual characteristics and reverse causality.

The link between SWB and the quality of social ties has been also analysed in a broader sense showing that happiness depends on the level of "social capital". According to the definition provided by OECD (2001, p. 41), the term should be associated with "networks together with shared norms, values and understandings that facilitate co-operation within or among groups". Putnam (2000) proposes various measures of social capital: intensity of involvement in community and organizational life; public engagement (e.g. voting) and volunteering; informal sociability (e.g. visiting friends); and reported levels of interpersonal trust. Empirical evidence shows that, no matter which measure is applied, the level of social capital is positively related to subjective well-being (Bartolini et al., 2013b; Helliwell, 2006; Helliwell and Putnam, 2004; Ram, 2010; Sarracino, 2010, 2012). Additionally, Sarracino (2013) documents that social capital enters positively the happiness equation indifferently in low income and high income countries. The analysis of social capital in a dynamic perspective indicates that social capital trends predict the long-run changes in subjective well-being much better than economic growth (Bartolini and Sarracino, 2014).

As the above review of studies shows, income comparisons and interpersonal relationships constitute two significant social dimensions of SWB. What is missing in the existing literature, however, is an investigation linking the two phenomena of interest. An intuition behind a possible association between the importance of income for well-being and the quality of social ties is given by positive psychologist: high concern for money and poor social relationships

are both related to materialism, a system of personal values ascribing greater importance to activities motivated extrinsically (Kasser, 2002).

The contribution of the present chapter consists of an empirical link between two fundamental aspects of well-being: social comparisons and social capital. Assuming that attachment to money and scarcity of social relations are both related to materialistic system of values, I show that more sociable and trustful people exhibit lower concern for individual and reference income. An eventual implication of such result is that a reduction of materialism may rise the level of social capital, and, vice-versa, an increase in social capital can decrease people's interest for money. Therefore, policies that reduce materialism or policies that increase social capital may possibly trigger a self-feeding mechanism that lowers interest for money and simultaneously increases social capital, having a positive impact on people's well-being.

2.3 Evidence from Cross Section

2.3.1 Data and Methodology

The primary data source used in the study is the European Union Statistics on Income and Living Conditions (EU-SILC). In 2013 the questionnaire included an ad-hoc module for measuring subjective well-being with a set of questions on overall experience of life, satisfaction with material living conditions, health, as well as leisure and social interactions. In the empirical analysis the well-being of an individual will be measured with the answer to a standard self-evaluative question: "Overall, how satisfied are you with your life these days? Please answer on a scale of 0 to 10, where 0 means 'Not at all satisfied' and 10 means 'Completely satisfied'."[16]

As far as social capital is concerned, I focus on its relational aspects looking at two commonly used measures of interpersonal relationships quality: trust in others (expressing individual *attitude*) and frequency of meeting friends (expressing individual *behaviour*) (OECD, 2001; Onyx and Bullen, 2000). The trust question asks respondents to indicate how trustful they are on a 11-step scale: "Would you say that most people can be trusted? Please answer on a scale from 0 to 10, where 0 means that in general 'You do not trust any other person' and 10 that you feel 'Most people can be trusted'." I construct a dummy variable equal to 1 for trust ranging from 6 to 10. The frequency of socializing is captured by the question: "Do you meet up with friends/family for a drink/meal (at home or outside) at least once a month?". The second social capital dummy variable is therefore equal to 1 if an individual meets his friends or family at least once per month. In order to capture both aspects of interpersonal relationships (behaviour and attitude) in one variable, I introduce an "index" of social capital which simply adds up the two dummies. The index will be a categorical variable assuming values {0, 1, 2}, whereas its highest level means that a person is both, trustful and sociable.[17]

[16]Several studies showed that direct questioning people about their recent affective experience as well as about global evaluation of their lives are reliable measures of subjective well-being. Answers to well-being questions correlate well with physical measures of affect such as frequency of smiling, heart rate measures, and electrical activity in the brain (Blanchflower and Oswald, 2004; Van Reekum et al., 2007) as well as with non-self-report measures based on evaluations of other people such friends and family (Sandvik et al., 1993). Moreover, single item scales provide similar correlates of SWB as the multi-item scales (Krueger and Schkade, 2008).

[17]The EU-SILC well-being module includes as well two variables measuring social support: "receiving help

The remaining variables of interest are individual and reference income. The individual income is defined as monthly disposable equivalised income adjusted to PPP.[18] I assume that individuals compare their incomes with others of similar socio-demographic characteristics who live in the same geographical area (Bartolini et al., 2013b; Boyce et al., 2010a; Ferrer-i-Carbonell, 2005). The reference income is thus calculated as the average individual income in the reference group defined as people of the same sex and age group living in the same region.[19]

The EU-SILC regression sample includes more than 320,000 observations coming from 29 European countries.[20] The average life satisfaction is 6.92, whereas 73% of the respondents meets friends at least monthly and around 58% is trustful (scoring between 6-10). Looking at the descriptive statistics for the social capital index, one can see that 14% of the sample scores 0, meaning that approximately 1 out of 7 individuals is neither sociable nor trustful, while 45% is both, trustful and sociable (for detailed descriptive statistics see table A12).

In order to test the hypothesis that social capital moderates the importance of income and income comparisons for well-being, I adapt a standard "happiness equation" introducing interaction terms between the social capital index and the income variables:

$$\begin{aligned} LS_i = \alpha &+ \beta_1 * log(Ind\ inc_i) + \beta_2 * log(Ref\ inc_i) + \beta_3 * SC\ index_i \\ &+ \beta_{13} * SC\ index_i * log(Ind\ inc_i) \\ &+ \beta_{23} * SC\ index_i * log(Ref\ inc_i) \\ &+ \boldsymbol{\gamma}' \boldsymbol{X}_i + \varepsilon_i \end{aligned} \tag{5}$$

where LS is the reported life satisfaction, *Ind inc* and *Ref inc* are individual and reference income, *SC index* is a categorical variable capturing the level of social capital, $\boldsymbol{X}$ is a vector of control variables (including: sex, age group, marital status, education level, labour market status, house owner, and country dummies)[21], and ε is the error term of standard properties. The interactions are introduced to check whether the impact of individual and reference in-

from others" and "having anyone to discuss with personal matters". I do not include them since the focus is placed on individual *behaviour* towards others (meeting socially) and individual *attitude* towards others (trust), while receiving help and having support describe rather the behaviour and attitudes of others towards the individual, accounting for the social environment around him.

[18]The equivalised disposable income is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults; household members are equalised or made equivalent by weighting each according to their age, using the so-called modified OECD equivalence scale (1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; 0.3 to each child aged under 14); see http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Equivalised_disposable_income. In the PPP adjustment I use price level indices for the actual individual consumption (EU28=100); see http://ec.europa.eu/eurostat/en/web/products-datasets/-/PRC_PPP_IND (last update 17.12.15, extracted 18.01.16).

[19]Five age groups (under 26, 26-35, 36-45, 46-55, 55+) * two genders * 104 regions = 1040 reference groups. The average number of individuals in a reference groups is around 312. For the list of regions see table A13.

[20]AT, BE, BG, CH, CY, DE, EE, EL, ES, FI, FR, HR, HU, IE, IS, IT, LT, LU, LV, MT, NL, NO, PL, PT, RO, RS, SE, SK and UK. Countries in which the question on meeting friends was not asked are dropped from the sample (CZ, DK and SI).

[21]I use age groups instead of age and age squared since the age variable in EU-SILC is not perfectly continuous; it groups all individuals aged 80+ in one category. Household size is not included in the regression as it is directly correlated with the equivalent income; still, including household size (or number of children) among the controls does not change the results.

come on life satisfaction varies with the level of social capital.[22] For the correct interpretation of interaction coefficient, the estimated model will include the main effects of the interacted variables (see Brambor, 2005; Braumoeller, 2004). I assume that self-reported life satisfaction scores can be treated as a cardinal variable employing an OLS regression, which allows to interpret the coefficients of interactions more easily. In fact, it has been shown that models assuming cardinality and those assuming ordinality of life satisfaction scores provide similar results (Ferrer-i-Carbonell and Frijters, 2004; Stutzer and Frey, 2006).

2.3.2 Results: Sample of Individuals

Main Result

The coefficients and statistical significance of the variables of interest confirm the common findings of the happiness literature (see table A1 for detailed results). Life satisfaction is positively related to individual income and negatively to reference income. The higher the income of an individual, the more satisfied he is, whereas his life satisfaction decreases with rising income of the reference group. The positive impact of social capital on well-being rises with the level of the SC index, showing that people being both, trustful and sociable are the happiest (holding other variables constant).

The main interest is focused, however, on the sign and statistical significance of the interaction terms. In fact, the signs are opposite to those of income variables, which indicates that the impact of own and reference income on well-being is smaller for individuals with higher social capital (table A1). Compared to people exhibiting the lowest value of social capital (index = 0), the life satisfaction of those who are either trustful or sociable (index = 1) is less affected by individual income (the coefficient is 9% smaller) and by reference income (the coefficient smaller by 8%, however, this difference is not significant).

In case of people being trustful and sociable (index = 2), the moderation effect for individual income amounts to -42%, while for reference income it is equal to -101%, both differences being statistically significant (table 1).[23] This means that at the highest level of social capital own income is less, but still important for life satisfaction, while the negative effect of reference income is entirely eliminated (figure 1). One can therefore conclude that social capital has a double positive effect on well-being: the direct effect, as life satisfaction rises with the level of social capital; and the indirect effect, as the reference income is no longer harmful for life satisfaction at the highest value of the SC index (figure 2).[24]

[22] When rearranging equation 5, it may be shown that the marginal effect of *Ind inc* on *LS* is equal to the expression $\beta_1 + \beta_{13} * SC\ index$; the same applies for *Ref inc* and $\beta_2 + \beta_{23} * SC\ index$ (see appendix A.2.1 for details). For a broader discussion on the interpretation of interaction terms see Balli and Sørensen (2013).

[23] The percentage moderation effect is calculated as the ratio of interaction coefficient to income coefficient. For example, the coefficient of "Social capital index = 2 * Log of individual income" is equal to -0.201, while for "Log of individual income" alone it is 0.479, meaning that for the category "SC index = 2" the income coefficient is $-0.201 + 0.479 = 0.278$; the original coefficient 0.479 is therefore decreased by 0.201, which in percentage terms gives $0.201/0.479 \simeq 42\%$ (see estimates of specification 3 in table A1).

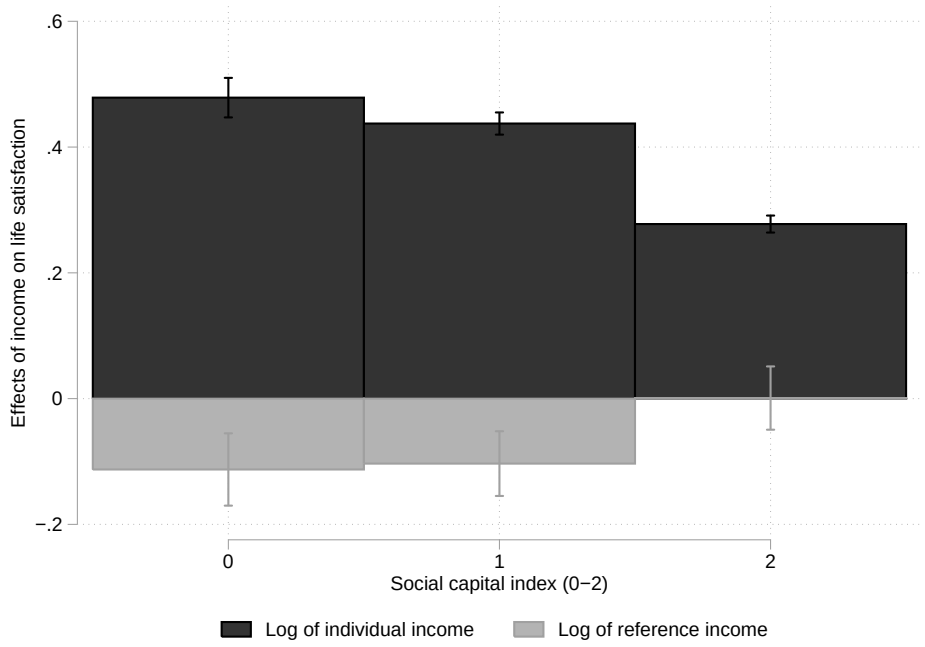
[24] Figure 2 shows that the slope of reference income does not significantly differ between *SC index* = 0 and *SC index* = 1 (as the interaction term $SC\ index = 1 * log(Ref\ inc)$ is insignificant), whereas the slope for *SC index* = 2 becomes flat showing that the negative impact of reference income is eliminated.

Table 1: Main results: moderation effects (EU-SILC 2013).

	Social capital index = 1	Social capital index = 2
Log of individual income	**-9%**	**-42%**
Log of reference income	**-8%** (n/s)	**-101%**

Note: Moderation effects express by how much the income coefficient is moderated at a given level of social capital index (compared to index = 0); the effects are calculated for specification 3 from table A1. n/s = not significant.

Figure 1: Income effects moderated by increasing social capital (EU-SILC 2013).



Note: Average marginal effects on the linear prediction of life satisfaction with 90% confidence intervals; calculated for specification 3 from table A1.

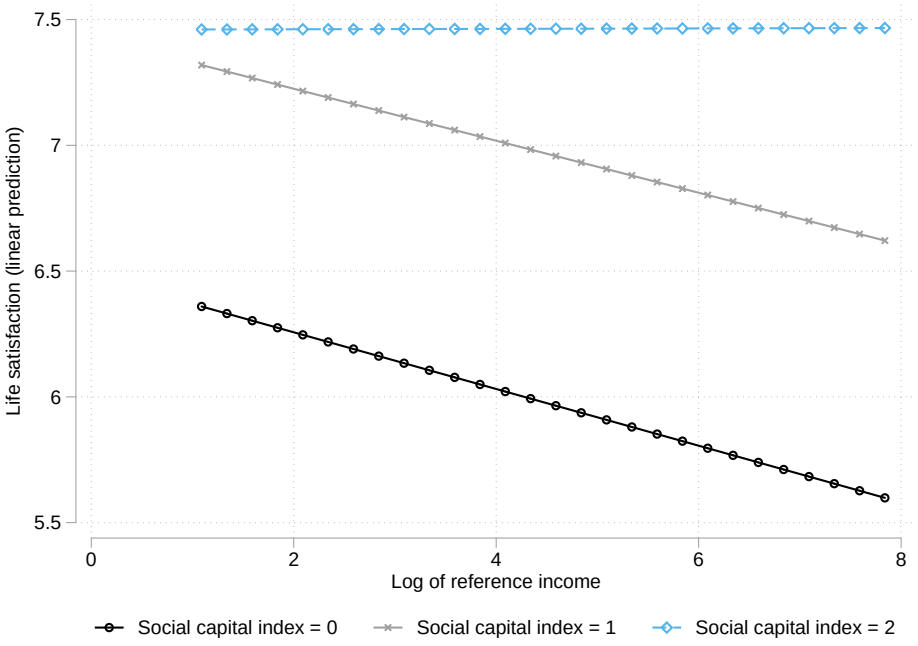
An important robustness check of the obtained results consists of splitting the sample into two groups of countries characterized by different economic and cultural background: Western Europe (developed countries) and Eastern Europe (economies characterized by the transition experience).[25] It has been shown in the literature that the impact of reference income on well-being in transition countries may actually be positive due to the so-called "tunnel effect".[26] However, after the sample split I actually find out that the impact of reference income on life satisfaction is negative and significant in both groups of countries. Importantly, the main result

[25]Western Europe: AT, BE, CH, CY, DE, EL, ES, FI, FR, IE, IS, IT, LU, MT, NL, NO, PT, SE and UK; Eastern Europe: BG, EE, HR, HU, LT, LV, PL, RO, SK and RS.

[26]During a transition from socialism to capitalism, when the social mobility is high, individual well-being may be positively affected by higher incomes of others as it is not necessary a source of envy and financial dissatisfaction, but may become a source of information creating positive expectations about own future income (Hirschman and Rothschild, 1973). Senik (2004) follows this reasoning and shows with Russian panel data from period 1994-2000 that reference income is positively correlated with life satisfaction on personal level, which contradicts the standard intuition behind utility and relative income. Additionally, Senik (2008) documents that higher reference income negatively affects individual happiness in Western Europe, but increases happiness in the transition countries of Eastern Europe (using data from 1989-2000). In the analysis with the 2013 data I find out the the impact of reference income is negative and significant in both groups of countries, which may suggests the the so-called "tunnel effect" was present exclusively during the most dynamic period of transition, that is, in the early 90-ties.

holds showing that for the highest level of social capital, the effects of individual and reference income on well-being are significantly moderated in both subsamples (table A1).[27]

Figure 2: Reference income effects eliminated for the highest social capital (EU-SILC 2013).



Note: Predictive margins calculated for specification 3 from table A1.

Instrumenting Social Capital

In the estimated happiness regression the coefficient of the social capital index is significant and strongly positive, however, the direction of causality is unclear: being sociable and trustful may make an individual happier, or, vice versa, happiness may positively affect his sociability and trust in others. Moreover, there may be some unobserved factors, e.g. personality traits, which affect both, social capital and happiness. This means that the social capital index is an endogenous variable and, in consequence, so are the interaction terms. In order to tackle the endogeneity problem, I employ the instrumental variable approach, assuming that in a regression including the main effect and the interaction effect it is necessary to instrument one and the other (Balli and Sørensen, 2013).

Finding a proper instrument for social capital is not a trivial task, as most of the factors affecting social life of an individual affect his happiness as well. I overcome this issue by using a method proposed by Lewbel (2012), which generates the so-called heteroskedasticity-based instruments. The Lewbel's approach allows to identify structural parameters in models with endogenous or mismeasured regressors; it may be used in "applications where other sources of identification, such as instrumental variables, repeated measurements, or validation studies, are not available. The identification comes from having regressors uncorrelated with the product of heteroscedastic errors, which is shown to be a feature of many models in which error correlations are due to an unobserved common factor, such as unobserved ability in returns to schooling

[27] I additionally run separate regressions interacting the income variables with a given social capital dummy instead of the index, which also gives significant interaction terms of the same signs (results presented in appendix A.1.1).

models, or the measurement error in mismeasured regressor models."[28] This relatively new method has been recently applied in various fields: finance (Boschi et al., 2014; Schlueter et al., 2015), international trade (Lin, 2015), agricultural economics (Emran and Shilpi, 2012), education economics (Denny and Oppedisano, 2013; Gao and Smyth, 2015; Mishra and Smyth, 2015), health economics (Brown, 2014; Schroeter et al., 2013), and, most importantly, happiness economics (Tiefenbach and Holdgrün, 2015; Tiefenbach and Kohlbacher, 2015).

I use the Lewbel's method to instrument the endogenous variables from equation 5: the main effect of social capital index, the interaction with individual income, and the interaction with reference income.[29] I first regress each of the endogenous variables on the vector of controls from equation 5:

$$Endogenous\ variable_i = a + \boldsymbol{B}'\boldsymbol{X}_i + \epsilon_i. \tag{6}$$

A crucial assumption of the Lewbel's approach is that there is heteroskedasticity in the error term of the "first stage equation" (ϵ). In order to test it I run a Breusch-Pagan test indicating that the null of constant variance is rejected, which means that the the assumption is fulfilled and the Lewbel's generated instruments method may be applied. Next, I generate the instruments by multiplying the residuals from the "first stage equation" (equation 6) with each of the control variables in mean-centred form:

$$Z_j = (X_j - \overline{X}_j) * \hat{\boldsymbol{\epsilon}} \tag{7}$$

where j corresponds to a given control variable from vector $\boldsymbol{X}$, and $\hat{\boldsymbol{\epsilon}}$ is the vector of residuals from the "first-stage regression" of each endogenous variable on all controls from $\boldsymbol{X}$ (including a constant vector; equation 6). For each endogenous variable the number of generated instruments Z is therefore equal to the number of controls in vector $\boldsymbol{X}$.[30]

Finally, I estimate the "second stage equation" using the 2SLS method, instrumenting the endogenous variables with the generated instruments Z (results in table A2). The first important observation coming from the obtained results is that the positive impact of social capital on life satisfaction is causal in the specification with and without the interactions terms. Secondly, the estimates show that the OLS results hold after controlling for endogeneity of social capital: the effects of individual and reference income on well-being are significantly moderated. Again, I observe that the moderation effects for reference income are much stronger than for the individual income, and that at the highest level of social capital the negative impact of reference income on well-being is eliminated (table 2).

[28] Lewbel, 2012, p. 67. For a detailed description of the Lewbel's method see appendix A.2.3.

[29] Social capital index is a categorical variable, it is therefore necessary to instrument each category (dummy) and the interactions with each category; the list of the instrumented variables is thus the following: *SC index =1*, *SC index =2*, (*SC index =1*) $*$ *log*(*Ind inc*), (*SC index =2*) $*$ *log*(*Ind inc*), (*SC index =1*) $*$ *log*(*Ref inc*) and (*SC index =2*) $*$ *log*(*Ref inc*).

[30] For a detailed description of the procedure see appendix A.2.2.

Table 2: Instrumenting social capital: moderation effects (EU-SILC 2013).

	Social capital index = 1 (instrumented)	Social capital index = 2 (instrumented)
Log of individual income	**-55%**	**-81%**
Log of reference income	**-87%**	**-122%**

Note: Moderation effects express by how much the income coefficient is moderated at a given level of social capital index (compared to index = 0); the effects are calculated for specification 3 from table A2.

It is important to interpret the moderation effect for *SC index = 2* and reference income: it is higher than 100%, meaning that if an individual is sociable and trustful, the impact of reference income becomes positive, in other words, the "envy effect" turns into the "tunnel effect". Last but not least, the 2SLS results hold also after splitting the sample into Western and Eastern Europe (table A2).

2.3.3 Robustness Check: Alternative Dataset

A further robustness check consists of implementing an alternative dataset: I employ the last available wave (round 6) of the European Social Survey (ESS, 2012).[31] As already described, the three key concepts of the research question are: well-being, social capital, and income. The first is again proxied by reported life satisfaction, measured with the answers to a standard 11-step self-evaluation question: "All things considered, how satisfied are you with your life as a whole nowadays? Please answer using this card, where 0 means 'extremely dissatisfied' and 10 means 'extremely satisfied'."[32] I employ the same proxies of social capital as in the main analysis, focusing on its relational aspects: frequency of meeting friends and interpersonal trust. The question "How often do you meet socially with friends, relatives or work colleagues?" will be used in order to create a dummy variable equal to 1 if a respondent meets socially at least once per week.[33]

The ESS questionnaire asks three questions that are considered as proxies of interpersonal trust in a broader sense (compared to the previously used single-item question): "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?"; "Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?"; and "Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?". Each question can be replied on a scale ranging from 0 to 10, corresponding to the lowest and the highest degree of perceived trustworthiness, fairness, and helpfulness of others. I calculate the arithmetic mean of the three scores in order to create a dummy variable equal to 1 if the mean ranges between 6 and 10 (the dummy will be called "social trust" to distinguish it form the previously used

[31] Round 7 from 2014 has been recently released, however it is still incomplete missing the data from 7 participating countries; see http://www.europeansocialsurvey.org/data/country_index.html, accessed on February 29, 2016.

[32] ESS (2014).

[33] The ESS questionnaire explains that 'Meet socially' implies meeting by choice rather than for reasons of either work or pure duty. Originally there are seven possible answers (from 'Never' to 'Every day'), I choose 'Once a week' to create the dummy since it divides the sample into two groups of almost the same size (see table A15).

single-item proxy of trust in others). Finally, following the approach from the previous section, I define an index of social capital as a sum of the two dummies; it will therefore assume values from the set {0, 1, 2}.

Contrarily to the EU-SILC database, among the ESS variables there is no information about the exact amount of individual's income. Instead, the ESS questionnaire asks the respondent to choose the interval corresponding to his or her household's total income.[34] There are ten intervals which are adjusted to the income distribution in each country so that they constitute the income deciles. This implies that I will now use income in relative terms (measured with income rank) as a proxy of social comparisons.[35] I create a categorical variable "income rank" which will express the individual's position on the national income ladder. For the sake of simplicity, it will have three levels: income rank 1-3 (for the bottom three deciles), income rank 4-7 (for the middle four deciles), and income rank 8-10 (for the top three deciles).[36]

Additional transformations were needed in order to obtain the measure of income in absolute terms (disposable household monthly income from all sources). I first calculate the average from lower and upper bounds for each income decile, next, in case of the non-Euro countries I convert it into Euro, and then adjust for PPP.[37] I am aware of the imprecision of the absolute income proxy, still it is essential to introduce it into the analysis. To avoid further transformation of the absolute income variable, it is calculated as logarithm of household income (instead of equivalised income, as previously), however, I will now control for the presence of children in household.

Since there is a high correlation between the absolute and relative income variables, I introduce two separate regressions, one for interaction with household income (controlling for income rank, equation 8) and one for interaction with income rank (controlling for household income, equation 9):

$$\begin{aligned} LS_i = \alpha &+ \beta_1 * log(Hh\ inc_i) + \beta_2 * Inc\ rank_i + \beta_3 * SC\ index_i \\ &+ \beta_{13} * SC\ index_i * log(Hh\ inc_i) \\ &+ \boldsymbol{\gamma}' \boldsymbol{X}_i + \varepsilon_i \end{aligned} \tag{8}$$

$$\begin{aligned} LS_i = \alpha &+ \beta_1 * log(Hh\ inc_i) + \beta_2 * Inc\ rank_i + \beta_3 * SC\ index_i \\ &+ \beta_{23} * SC\ index_i * Inc\ rank_i \\ &+ \boldsymbol{\gamma}' \boldsymbol{X}_i + \varepsilon_i \end{aligned} \tag{9}$$

where LS is the reported life satisfaction, *Hh inc* is the household income, *Inc rank* is the

[34]Defined as "after tax and compulsory deductions, from all sources"; with the possibility to indicate weekly, monthly or annual income.

[35]Theoretical (Rablen, 2008) and empirical (Boyce et al., 2010a) studies demonstrate that relative income can be modelled as the relative rank of an income in the income distribution. I adopt this approach expecting that when a proxy of purchasing power (absolute income) is included in the regression equation, income rank reflects solely the relative importance of wealth being rather related to individual's economic position in the society.

[36]The reference category is defined as the middle deciles, so that, after introducing the interactions term, I can test whether the effect of being relatively poor/rich is moderated by social capital.

[37]Exchange rates come from the ESS documentation (ESS, 2014). PPP figures are taken from Eurostat, they express price level indices for the actual individual consumption (EU28=100); see footnote 18.

income rank variable with three categories (bottom deciles, middle deciles - base level, and top deciles), *SC index* is a categorical variable measuring the level of social capital, and $\boldsymbol{X}$ includes the control variables (sex, age, age squared, living with partner, living with children, years of education, labour market status, country dummies).

The regression sample includes around 35,000 observations coming from 25 European countries.[38] The average life satisfaction is equal to around 6.89, while as the social capital index is concerned, 26% of the sample scores 0, 47% scores 1, and 27% scores 2 (which means being trustful and meeting socially at least weekly; see table A15 for detailed descriptive statistics).

The results confirm the finding from the previous paragraph: higher social capital moderates the impact of income and income comparisons on well-being. Again, the moderation effect obtained for the proxy of income comparisons (income rank) is stronger than the one obtained for own income (table 3).[39] Moreover, at the highest value of social capital index, the impact of absolute income is significantly weaker but still positive (figure 3), while the impact of relative income is eliminated as it becomes insignificant (figure 4).

Table 3: Main results: moderation effects (ESS 2012).

	Social capital index = 1	Social capital index = 2
Log of household income	**-25%**	**-69%**
Income rank 1-3	**-33%** (n/s)	**-129%**
Income rank 8-10	**-59%**	**-100%**

Note: Moderation effects express by how much the income coefficient is moderated at a given level of social capital index (compared to index = 0); the effects are calculated for specifications 2 (first row) and 3 (second and third row) from table A5. n/s = not significant.

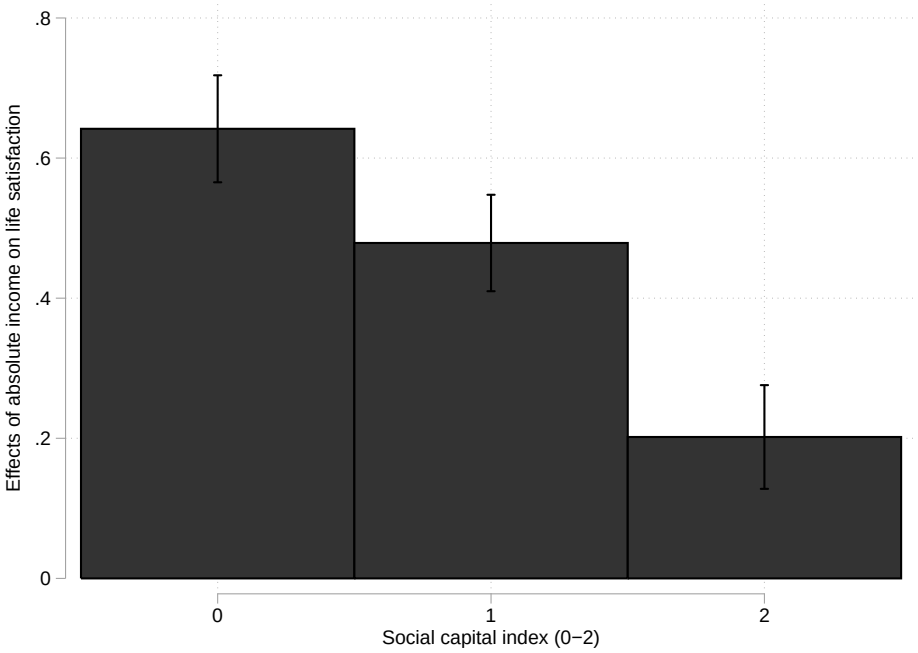
The analysis performed with the ESS data constitutes an important robustness check of the EU-SILC results not only because it leads to the same conclusions with the use of an alternative dataset, but also because the approach to the concept of income comparisons is different. In the methodology applied in the previous section I used reference income as the proxy variable for income comparisons, assuming that an individual compares his incomes with others of the same sex, age and living in the same region, which additionally implies that he makes an evaluation of how much the others earn.[40] In the ESS questionnaire the respondent is asked to choose the income decile corresponding to his earnings, therefore he can immediately assess his position in the national income ladder. In this approach the "reference group assumption" is not required, while the information about the income of others comes directly from the questionnaire (since the lower and upper bounds of each decile are precisely specified).

[38] AL, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, HU, IE, IS, IT, LT, NL, NO, PL, PT, SE, SI and SK. I had to exclude IL, RU, UA and XK since the Eurostat PPP data was missing for these 4 countries.

[39] The same result is obtained when interacting the income variables with social capital dummies instead of the index (see appendix A.1.1).

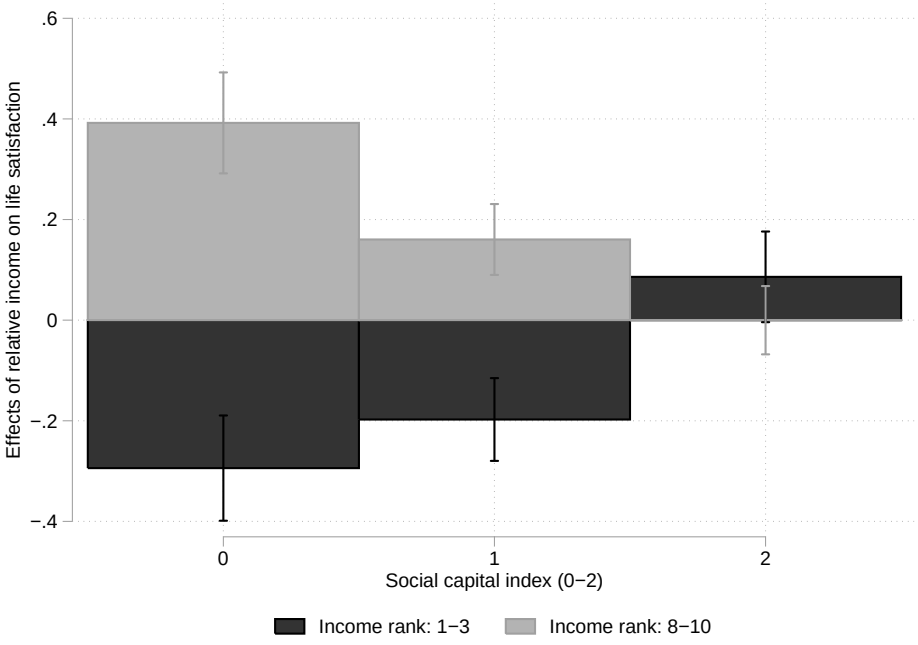
[40] In fact, the psychological literature shows that an individual may choose his reference group instrumentally; in a motivational strategy, he will compare his outcomes to those of the people above him (self-improvement), while in order to feel more appreciated he will adapt a self-validation strategy comparing with others below him (self-enhancement) (Diener and Fujita, 1995; Falk and Knell, 2004). Other studies demonstrate that optimistic individuals are more likely to compare downward, whereas pessimistic individuals tend to compare with more successful ones (Lyubomirsky and Ross, 1997).

Figure 3: Absolute income effects moderated by increasing social capital (ESS 2012).



Note: Average marginal effects on the linear prediction of life satisfaction with 90% confidence intervals; calculated for specification 2 from table A5.

Figure 4: Relative income effects eliminated for the highest social capital (ESS 2012).



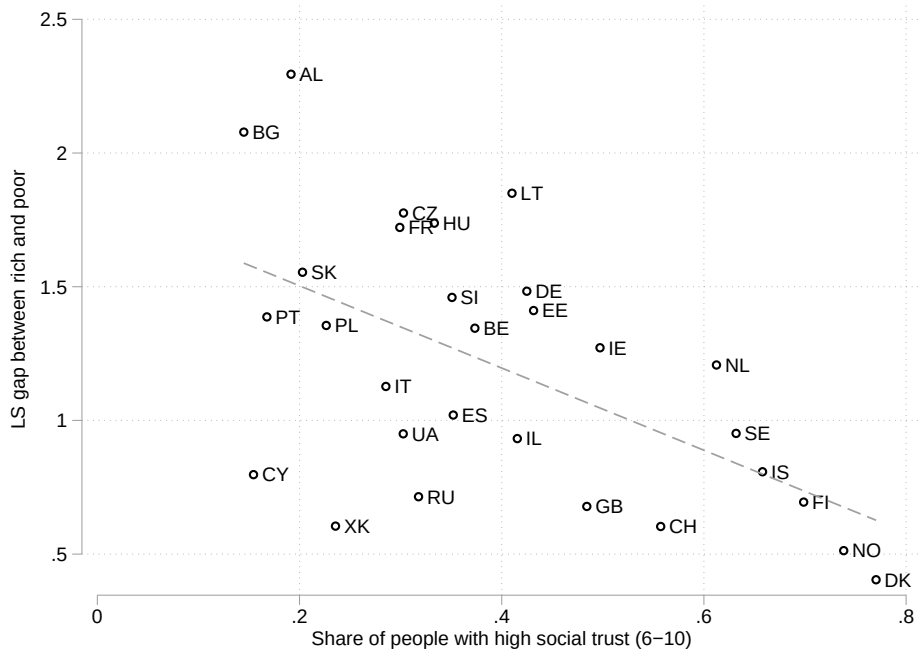
Note: Average marginal effects on the linear prediction of life satisfaction with 90% confidence intervals; calculated for specification 3 from table A5.

2.3.4 Results: Sample of Countries

For further cross-sectional investigation I introduce macro-level variables created by aggregating the micro data at country level. I assume that if social capital moderates the importance of income for well-being on individual level, one can expect that the well-being gap between income groups should be smaller in countries with higher social capital.

First, I calculate the average life satisfaction of the individuals defined as "poor" (in the ESS sample those with household income rank between 1-3, in the EU-SILC those in the bottom quintile of equivalised income) and for individuals defined as "rich" (income rank 8-10 in the ESS, top quintile in the EU-SILC). The difference between the two averages will be called "life satisfaction gap between rich and poor" and will be calculated for each country. Intuitively, the gap is positive in all countries as the average life satisfaction in the high income group is always greater than the average life satisfaction in the low income groups. Next, I aggregate the trust dummy obtaining a macro variable expressing the share of people with high trust (scores between 6-10): social trust in case of the ESS and trust in others in the EU-SILC.[41]

Figure 5: Well-being gap between rich and poor decreases with social trust (ESS 2012).



Note: Weighted averages.

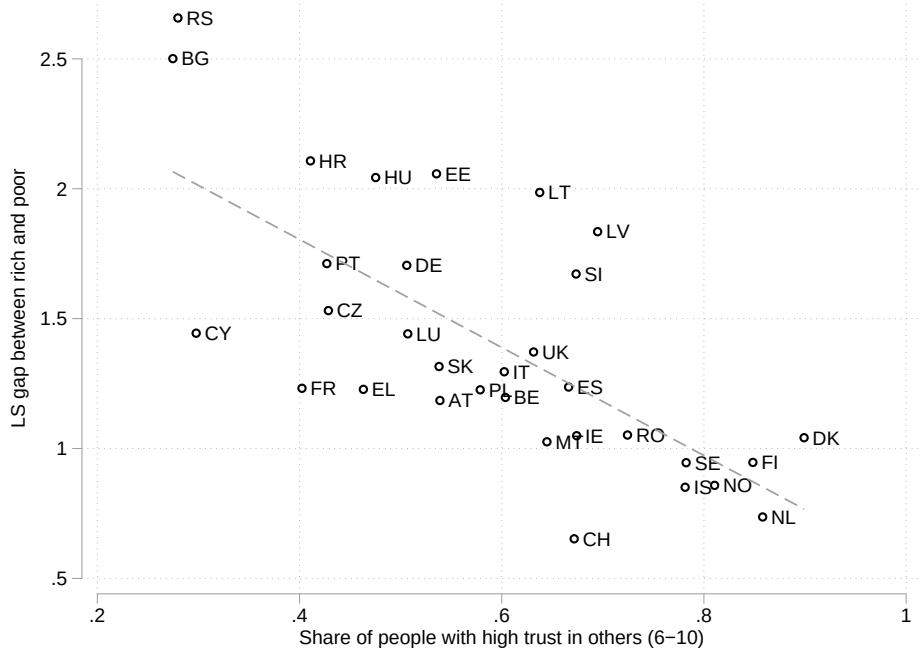
Figures 5 and 6 present the results graphically.[42] In both analysed samples the average score of trust is negatively correlated with the life satisfaction gap between the rich and poor. This finding goes in line with the results coming from the micro analysis: as social capital moderates the individual effects of income on well-being, the life satisfaction discrepancies between the rich and the poor are smaller in societies more endowed with social capital.

It is plausible to assume, however, that the well-being differences between income classes are mainly driven by income inequalities: if there are high disparities in income between the rich and the poor, most likely the life satisfaction gap between the two groups will also be elevated. What is more, the degree of interpersonal trust is typically higher in developed countries (see figures 5 and 6). In order to account for this, I perform a regression controlling for the Gini index and for the level of GDP per capita. The estimated model will have the following form:

[41] All the calculated averages are weighted: in the ESS with the design weight (*dweight*), in the EU-SILC with the personal cross-sectional weight (*RB050*), as recommended by the data providers in the user's manuals.

[42] In the macro analysis I include the countries previously dropped due to missing data: the ESS sample will now have 29 countries (including IL, RU, UA and XK), while the EU-SILC sample will consist of 32 countries (including CZ, DK and SI).

Figure 6: Well-being gap between rich and poor decreases with trust in others (EU-SILC 2013).



Note: Weighted averages.

Table 4: Well-being gap between rich and poor: regression results (EU-SILC 2013).

	(1) LS gap	(2) LS gap	(3) LS gap	(4) LS gap	(5) LS gap	(6) LS gap
Trust in others	-2.080***			-1.607***	-1.713***	-1.454***
	(-4.98)			(-3.72)	(-3.97)	(-3.38)
Gini index		7.589***		3.880**		2.672
		(3.74)		(2.18)		(1.53)
GDP per capita			-0.0227***		-0.0137*	-0.0112
			(-3.57)		(-1.90)	(-1.69)
Number of observations	32	32	32	32	32	32
Adjusted R^2	0.474	0.323	0.275	0.525	0.556	0.571

Note: OLS regressions with robust standard errors. Observations = countries. Dependent variable: the difference in average life satisfaction between the first and fifth income quintile in a given country. "Trust in others" is the share of people declaring trust in others between 6-10. Gini index is calculated for equivalised income. GDP per capita is expressed in purchasing power standards (in thousands). All macro variables are derived using weights. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

$$LSgap_k = \alpha + \beta * Trust_k + \gamma * Gini_k + \delta * GDPpc_k + \varepsilon_k \tag{10}$$

where *LSgap* stands for the life satisfaction gap between the rich and the poor, *Trust* is the share of people with high trust in others (scores 6-10), *Gini* is the Gini index calculated for equivalised income, *GDPpc* is the GDP per capita adjusted to purchasing power parity[43], k indicates the country ($k = 32$), and ε is an error term with standard properties.[44]

[43]I use data from Eurostat for "Gross domestic product at market prices" in "Current prices, PPS per capita"; see http://ec.europa.eu/eurostat/en/web/products-datasets/-/NAMA_10_PC (last update 15.03.16, extracted 15.03.16). PPS stands for "purchasing power standard"; see http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Purchasing_power_standard_(PPS)

[44]See table A14 for descriptive statistics of the EU-SILC macro variables.

The results show that the negative relationship between social capital and the well-being gap between income groups is significant also after controlling for income inequalities and the level of economic development (table 4). Interestingly, the effects of Gini index and GDP per capita on the life satisfaction gap become insignificant when trust in others is included in the regression. This suggests that social capital should be considered as one of the main drivers of happiness inequality.

2.4 Evidence from Panel

In the second part of the empirical analysis I employ panel data in order to: (i) control for individual unobserved heterogeneity; (ii) investigate a possible causal relationship between changes in social capital in time and the impact of income on well-being. The sample comes from the last available version of the German Socio-Economic Panel (GSOEP) released in 2015 (covering period 1984-2013).[45] GSOEP is a household based study which reinterviews adult household members on an annual basis generating a representative sample for the German population of the last three decades.

2.4.1 Controlling for Fixed Effects

In order to control for time invariant unobserved characteristics, e.g. personality traits, I introduce the individual fixed effects (f_i) within the same methodological framework as in the EU-SILC analysis.[46] The model will now take the following form:

$$\begin{aligned} LS_{i,t} = \alpha &+ \beta_1 * log(Ind\ inc_{i,t}) + \beta_2 * log(Ref\ inc_{i,t}) + \beta_3 * SC\ index_{i,t} \\ &+ \beta_{13} * SC\ index_{i,t} * log(Ind\ inc_{i,t}) \\ &+ \beta_{23} * SC\ index_{i,t} * log(Ref\ inc_{i,t}) \\ &+ \boldsymbol{\gamma}' \boldsymbol{X}_{i,t} + f_i + \varepsilon_{i,t}. \end{aligned} \tag{11}$$

Life satisfaction (LS) is measured on a 0-10 scale[47], individual income ($Ind\ inc$) is defined as monthly equivalised disposable income and is adjusted to price level in a given year, while the vector of controls ($\boldsymbol{X}$) includes socio-demographic characteristics as well as year and regional dummies.[48] The definition of the reference income does not change: I assume that people compare their incomes with others of the same sex, age group and living in the same geographical area.[49]

[45] I use the data from version 30 in long format; see https://www.diw.de/en/diw_01.c.504352.en/soep_v30.html.

[46] In order to decide between fixed or random effects I run the Hausman test; the null hypothesis that the individual effects are uncorrelated with the other regressors in the model is rejected. Between the two alternatives, the fixed effects model is therefore the better choice (see Greene, 2008, pp. 301-303).

[47] The GSOEP questionnaire uses the following question: "Please answer on a scale from 0 to 10, where 0 means 'completely dissatisfied' and 10 means 'completely satisfied: How satisfied are you with your life, all things considered?".

[48] Controls include: sex (omitted due to fixed effects), age, age squared, martial status, years of education, labour market status, house owner, living in East Germany, regional dummies, year dummies.

[49] Following the existing studies on income comparisons in Germany (Bartolini et al., 2013b; Ferrer-i-Carbonell, 2005), for "geographical area" I distinguish between West and East. The variables used to construct reference groups are the following: sex, age group (below 26, 26-35, 36-45, 46-55, 55+), living in East/West, and year. This will give 2*5=10 reference groups per year for the 3 years before unification (which do not include

The availability of social capital proxies in the GSOEP questionnaire will influence the composition of the social capital index. Trust variable is no longer available, however, I will involve two new proxies of social capital: helping and volunteering.[50] The index will be now defined as a sum of three dummy variables (capturing individual behaviour towards others): attending social gatherings, helping friends, and performing volunteering work (each is equal to 1 if the respondent carries out a given activity at least once per month)[51]. This implies that the new social capital index will have 4 categories: ranging from 0 (for individuals not performing any of the activities) to 3 (for those who perform all three activities).

The regression sample is limited to the 12 waves in which all the required variables are present; it includes around 41,000 individuals interviewed at least two times between 1985-2011, giving more than 158,000 observations.[52] The average life satisfaction in the sample is equal to 6.97; I observe the following shares of individuals scoring 0, 1, 2 or 3 in the social capital index: 16%, 36%, 35% and 13%, respectively (for detailed descriptive statistics see table A16).

Controlling for fixed effects and using different proxies of social capital does not change the main results: (i) with rising social capital the impact of income and income comparisons on well-being is significantly moderated (as all the interaction terms are significant, see table A8); (ii) for the highest level of social capital the effect of individual income is still positive, while the negative effect of reference income becomes insignificant (figure 7); (iii) the moderation effects are much stronger in case of reference income (table 5). Additionally, I run separate regressions for West and East Germany, characterized by different socio-economic background, showing that the interactions terms are significant also in smaller, more homogeneous samples (table A8).[53]

Table 5: Main results: moderation effects (GSOEP 1985-2011).

	Social capital index = 1	Social capital index = 2	Social capital index = 3
Log of individual income	**-18%**	**-28%**	**-47%**
Log of reference income	**-40%**	**-64%**	**-73%**

Note: Moderation effects express by how much the income coefficient is moderated at a given level of social capital index (compared to index = 0); the effects are calculated for specification 3 from table A8.

East Germany), and 2*2*5=20 reference groups per year for the 9 years after unification. Altogether it gives 10x3+20x9=210 reference groups for the whole sample. The average size of a reference groups is around 755, the smallest one contains 140 individuals, the biggest 2852.

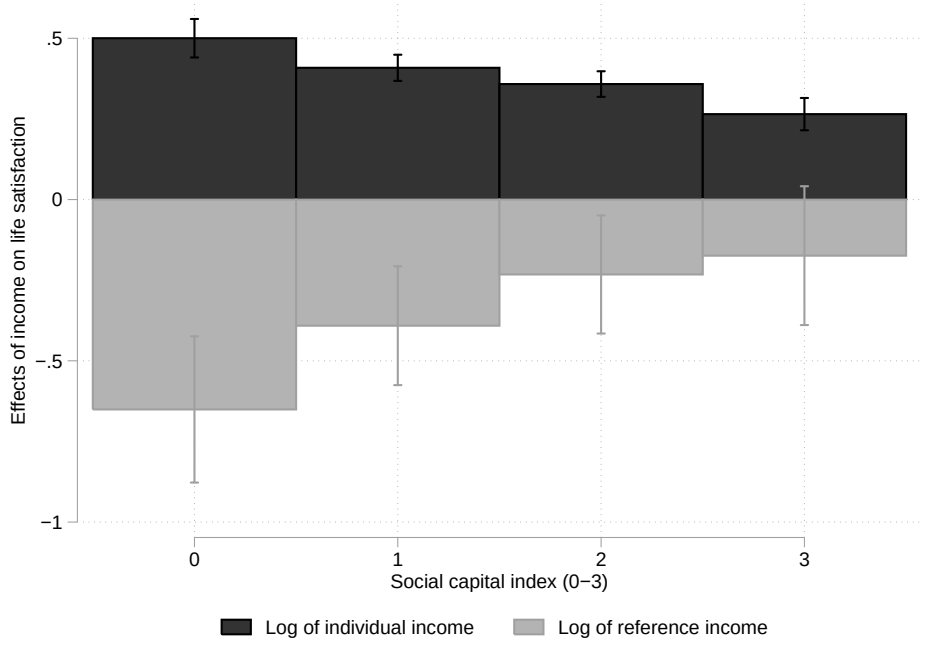
[50]In fact, the trust question is present in years 2003, 2008 and 2013, however, in these years other proxies of social capital are not included in the questionnaire.

[51]Source variables: Attend Social Gathering (*pli0094*), Helping Relatives, Friends (*pli0095*), Perform Volunteer Work (*pli0096*). The battery of questions on social participation in GSOEP includes also Participate In Local Politics; I exclude this variable assuming that the motivation behind being involved in political activities is not necessarily intrinsic.

[52]Included years: 1985, 1986, 1988, 1992, 1994, 1996, 1997, 1999, 2005, 2007, 2009 and 2011. The social participation questions were also asked in 1984, 1990 and 2001, but in 1984 the information on region (NUTS 1, Federal State) is missing, while in 1990 the questions were asked only in the East Germany, whereas for 2001 the volunteering variable is not present.

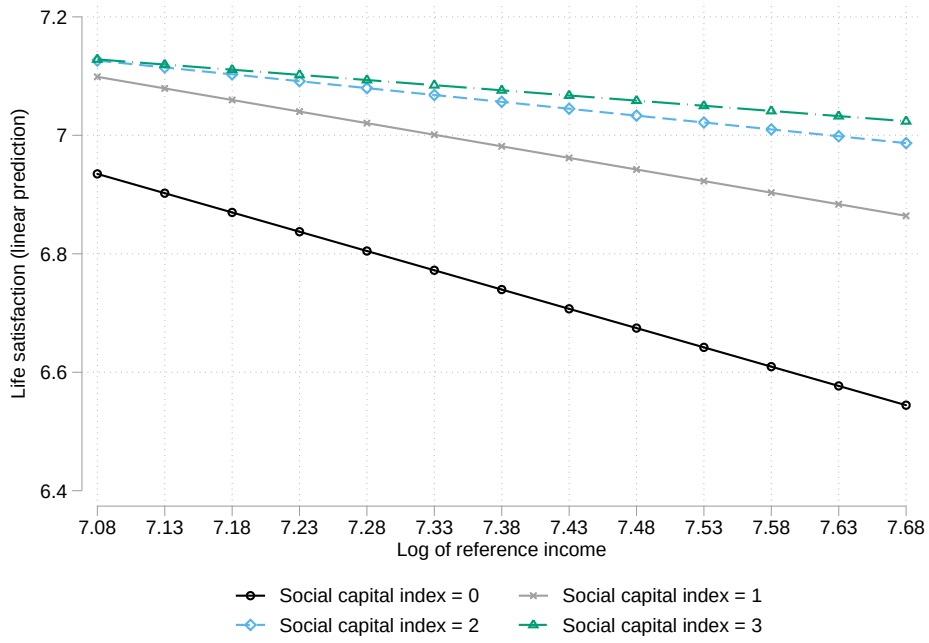
[53]The income variables are also interacted with a given social capital dummy instead of the index, which gives significant interaction terms of the same signs (results presented in appendix A.1.1).

Figure 7: Income effects moderated by increasing social capital (GSOEP 1985-2011).



Note: Average marginal effects on the linear prediction of life satisfaction with 90% confidence intervals; calculated for specification 3 from table A8.

Figure 8: Reference income less harmful for well-being with higher social capital (GSOEP 1985-2011).



Note: Predictive margins calculated for specification 3 from table A8.

Again, one can conclude that social capital positively affects well-being in two manners: it is associated with higher well-being (direct effect), and it moderates the detrimental effects of income comparisons on well-being (indirect effect). Figure 8 illustrates both effects; with increasing social capital index: the predicted life satisfaction rises and the negative slope of reference income becomes flatter.

Compared to the results obtained in the cross-sectional analysis, the only difference here is that at the highest level of social capital the income comparison effects are moderated but not entirely eliminated (the slope for *SC index = 3* is not perfectly flat, as the moderation effect amounts to -73%). This may suggest that a necessary condition for eliminating the negative effect of reference income (the "envy effect") is the high degree of interpersonal trust (a variable included in the SC index in the EU-SILC and ESS, but not present in the GSOEP analysis due to data limitations).

2.4.2 Changes of Social Capital

In the final step of the empirical analysis I employ the GSOEP data in order to test the following hypothesis: positive (negative) changes in social capital from yesterday to today are associated with lower (higher) importance of income and income comparisons for well-being today. I create a categorical variable capturing positive and negative changes in the social capital index:

$$\Delta SC\ index_{\ t} = \begin{cases} negative\ change, & \text{if } SC\ index_{\ t} < SC\ index_{\ t-1} \\ no\ change, & \text{if } SC\ index_{\ t} = SC\ index_{\ t-1} \\ positive\ change, & \text{if } SC\ index_{\ t} > SC\ index_{\ t-1}. \end{cases} \tag{12}$$

$\Delta SC\ index_{\ t}$ will be implemented into the happiness regression being interacted with individual and reference income in time t (setting *no change* as the reference category):

$$\begin{aligned} LS_{i,t} = \alpha &+ \beta_1 * log(Ind\ inc_{i,t}) + \beta_2 * log(Ref\ inc_{i,t}) + \beta_3 * \Delta SC\ index_{i,t} \\ &+ \beta_{13} * \Delta SC\ index_{i,t} * log(Ind\ inc_{i,t}) \\ &+ \beta_{23} * \Delta SC\ index_{i,t} * log(Ref\ inc_{i,t}) \\ &+ \boldsymbol{\gamma}' \boldsymbol{X}_{i,t} + f_i + \varepsilon_{i,t}. \end{aligned} \tag{13}$$

This means that each of the two income variables is going to be interacted with a dummy for negative change and a dummy for positive change.

I run three separate regressions in order to check whether the impact of social capital change on the importance of income for well-being may be lagged in time: first, I use $SC\ index_{\ t}$ as defined in equation 12, then I create analogical variables for $t-2$ and for $t-3$.[54] There results can be summarized as follows (see table A9 for estimates):

- a negative change in social capital from yesterday to today is associated with higher importance of individual income for well-being today (the interaction is significant in the specifications for $t-2$ and $t-3$);
- a positive change in SC is associated with lower importance of individual income (significant for all three lags);

[54]The sample is now limited to individuals present in two subsequent waves ($t-1$ and t). I end up with around 119,000 observations, of which ∼30,000 (25%) exhibit a negative change in social capital index, ∼61,000 (51%) exhibit no change, while ∼28,000 (24%) exhibit a positive change. For $t-2$ the numbers are, respectively, ∼92,000 (sample size), ∼25,000 (27%), ∼43,000 (47%), and ∼24,000 (26%). Finally, for $t-3$ I have ∼68,000 (sample size), ∼19,000 (28%), ∼30,000 (44%), and ∼19,000 (28%).

- a negative change in SC reinforces the negative impact of reference income on well-being (significant for all three lags);
- a positive change in SC moderates the negative impact of reference income (significant for $t-1$).

The above findings suggest that it is plausible to assume the existence of a causal relationship between the analysed variables: an increase in social capital is likely to cause lower importance of income and income comparisons for well-being. Importantly, also in the case of social capital changes, the moderation effects are higher in magnitude for reference income than for absolute income (table 6).

Table 6: Changes of social capital: moderation effects for *t-1* (GSOEP 1985-2011).

	Social capital index: negative change	Social capital index: positive change
Log of individual income	**+9%** (n/s)	**-18%**
Log of reference income	**+29%**	**-30%**

Note: Moderation effects express by how much the income coefficient is moderated for a given change in social capital index (compared to Social capital index: no change); the effects are calculated for specification 1 from table A9. n/s = not significant.

2.5 Conclusions and Policy Implications

Using data from two European cross-sectional surveys and from the German Socio-Economic Panel, I show that:

(i) individual income is positively correlated with life satisfaction and this relationship is significantly weaker for individuals with higher social capital, meaning that they have lower material interests;

(ii) reference income is negatively correlated with life satisfaction and this relationship is significantly weaker for individuals with higher social capital, meaning that they are less affected by income comparisons;

(iii) social capital moderates the importance of income for well-being, while the moderation effects for reference income are stronger than those for individual income.

Importantly, the above statements hold after accounting for the endogeneity of social capital and after controlling for the individual unobserved heterogeneity. Additionally, as the panel data analysis demonstrated, it is reasonable to expect that positive changes in social capital are likely to reduce the material interests of individuals.

These findings provide an empirical evidence that the two components of SWB usually analysed separately in happiness economics, the importance of income and the level of social capital, actually constitute two faces of the same phenomenon, that is, materialism. People who exhibit higher values of social capital, as they are less materialistic, tend to attach less importance to money expressed in absolute and relative terms. For individuals who are trustful and often meet socially, the effects of individual income on life satisfaction are significantly moderated, while the negative effects of reference income are practically eliminated and become insignificant. This outcome indicates that in the societies highly endowed with social capital, economic growth may be followed by happiness growth: if for high levels of trust and sociability

the concern for relative income is eliminated, while the absolute income still positively affects happiness, social capital becomes a necessary condition to make economic growth compatible with happiness growth. Similar result has been recently obtained by Mikucka and Sarracino (2014), who demonstrate that economic growth has a positive effect on subjective well-being in presence of increasing social trust and decreasing income inequality.

Therefore, social capital should be taken into consideration in future studies on the happiness-income paradox defined by Easterlin (1974, 1995). This additional social dimension of SWB is crucial for determining the long-run relationship between economic growth and society's well-being. Income comparisons play a significantly more important role in life satisfaction assessments in case of individuals with lower social capital. In consequence, such individuals are less likely to benefit from economic growth bringing higher standards of living to all. As the effects of relative income are virtually eliminated at high levels of trust and sociability, while the positive relationship between SWB and absolute income is maintained, it is plausible to assume that social capital is a necessary condition for making economic growth consistent with happiness growth.

The intuition behind the results on micro level is supported by the macro analysis. Social capital is significantly and negatively correlated with the life satisfaction gap between income groups. In countries characterized by high degree of interpersonal trust, the differences in average SWB between the rich and the poor is smaller. That is to say, societies highly endowed with social capital are more egalitarian in terms of happiness distribution among income groups. This finding constitutes an important contribution to the growing literature on happiness inequality, which, so far, has not considered the role of social capital (see, e.g., Becchetti et al., 2014; Delhey and Kohler, 2011; Dutta and Foster, 2013).

Clark et al. (2012) argues that in countries which have exhibited positive income growth, the happiness inequality has decreased, adding that "if raising the income of all does not raise the happiness of all, it will at least harmonize the happiness of all". The results obtained in the macro analysis suggest, instead, that SWB inequality may be reduced by increasing social capital. Raising social capital of all can raise the happiness of all and it can harmonize the happiness of the rich and poor. This conclusion, however, should be taken with care as it comes from cross-sectional data. Further investigation of international happiness times-series should therefore focus on the relationship between the trends of social capital and the trends of SWB inequality.

Finally, increases in the level of social capital, apart from having a direct positive impact on well-being, should be expected to build a society that is less dependent on material goods and more attached to commonly shared values such as solidarity, equality and civic engagement. Policies aimed to increase social capital or to reduce materialism could stimulate a mechanism that lowers people's interest for positional competition and, at the same time, increases trust and cooperation among individuals.

A.1 Appendix A.1: Regressions Results and Descriptive Statistics

A.1.1 Regressions Results

EU-SILC: Social Capital Index

Table A1: Main results (EU-SILC 2013).

	(1) All	(2) All	(3) All	(4) West	(5) East
Log of individual income	0.375***	0.430***	0.479***	0.405***	0.585***
	(55.91)	(53.34)	(25.04)	(15.99)	(21.27)
Log of reference income	-0.0656**	-0.0600**	-0.113***	-0.342***	-0.427***
	(-2.18)	(-1.99)	(-3.22)	(-6.55)	(-6.06)
Social capital index = 1 * Log of individual income		-0.0311***	-0.0411*	-0.0201	-0.0627**
		(-6.06)	(-1.91)	(-0.71)	(-1.98)
Social capital index = 2 * Log of individual income		-0.0984***	-0.201***	-0.176***	-0.198***
		(-18.32)	(-9.79)	(-6.55)	(-6.39)
Social capital index = 1 * Log of reference income			0.00933	0.0520	0.0422
			(0.43)	(1.18)	(1.34)
Social capital index = 2 * Log of reference income			0.114***	0.177***	0.175***
			(5.46)	(4.20)	(5.64)
Social capital index = 1	1.060***	1.209***	1.203***	0.746***	1.123***
	(88.77)	(40.20)	(37.66)	(3.12)	(31.95)
Social capital index = 2	1.724***	2.307***	2.215***	1.549***	1.914***
	(143.80)	(71.14)	(64.30)	(6.71)	(49.34)
Controls (socio-demographic, country)	Yes	Yes	Yes	Yes	Yes
Number of observations	324059	324059	324059	207614	116445
Adjusted R^2	0.302	0.303	0.303	0.238	0.349

Note: OLS with robust standard errors. Dependent variable: Life satisfaction. Omitted categories: "Social capital index = 0", "Social capital index = 0 * Log of individual income" and "Social capital index = 0 * Log reference income". Controls: sex, age group, marital status, education level, labour market status, house owner, country dummies. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

Table A2: Instrumenting social capital: 2SLS (EU-SILC 2013).

	(1) All	(2) All	(3) All	(4) West	(5) East
Log of individual income	0.416***	0.421***	0.878***	0.874***	0.898***
	(64.87)	(60.10)	(30.63)	(20.88)	(22.46)
Log of reference income	-0.0531*	-0.0612**	-0.502***	-0.842***	-0.727***
	(-1.77)	(-2.06)	(-12.39)	(-14.33)	(-9.46)
Social capital index = 1 (inst.) * Log of individual income		-0.0289***	-0.480***	-0.513***	-0.453***
		(-6.17)	(-13.80)	(-10.59)	(-8.86)
Social capital index = 2 (inst.) * Log of individual income		-0.0812***	-0.709***	-0.761***	-0.588***
		(-15.34)	(-20.68)	(-15.16)	(-12.00)
Social capital index = 1 (inst.) * Log of reference income			0.436***	0.578***	0.422***
			(12.80)	(10.45)	(8.48)
Social capital index = 2 (inst.) * Log of reference income			0.610***	0.784***	0.558***
			(18.14)	(13.89)	(11.64)
Social capital index = 1 (inst.)	1.244***	1.178***	1.105***	0.269	1.051***
	(65.41)	(43.53)	(38.55)	(1.48)	(31.96)
Social capital index = 2 (inst.)	1.302***	2.208***	2.117***	1.133***	1.848***
	(42.66)	(69.11)	(64.16)	(6.46)	(47.64)
Controls (socio-demographic, country)	Yes	Yes	Yes	Yes	Yes
Number of observations	324059	324059	324059	207614	116445
Adjusted R^2	0.286	0.303	0.301	0.234	0.348

Note: 2SLS regression with heteroskedasticity-based instruments (instrumented variables: "Log of individual income (inst.)", "Log of reference income (inst.)", "Social capital index (inst.) = 1", "Social capital index (inst.) = 2", "Social capital index (inst.) = 1 * Log of individual income", "Social capital index (inst.) = 1 * Log of reference income", "Social capital index (inst.) = 2 * Log of individual income", "Social capital index (inst.) = 2 * Log of reference income"). Dependent variable: Life satisfaction. Omitted categories: "Social capital index (inst.) = 0", "Social capital index (inst.) = 0 * Log of individual income" and "Social capital index (inst.) = 0 * Log reference income". Controls: sex, age group, marital status, education level, labour market status, house owner, country dummies. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

EU-SILC: Social Capital Dummies

Table A3: Interacting social capital dummies (EU-SILC 2013).

	(1) SC = Getting together with friends	(2) SC = Trust in others
Log of individual income	0.477*** (33.92)	0.619*** (53.17)
Log of reference income	-0.0749** (-2.25)	-0.143*** (-4.48)
SC * Log of individual income	-0.0940*** (-6.05)	-0.270*** (-20.14)
SC * Log of reference income	0.0301* (1.89)	0.208*** (14.88)
SC (main effect)	Yes	Yes
Controls (socio-demographic, country)	Yes	Yes
Observations	324059	324059
Adjusted R^2	0.270	0.279

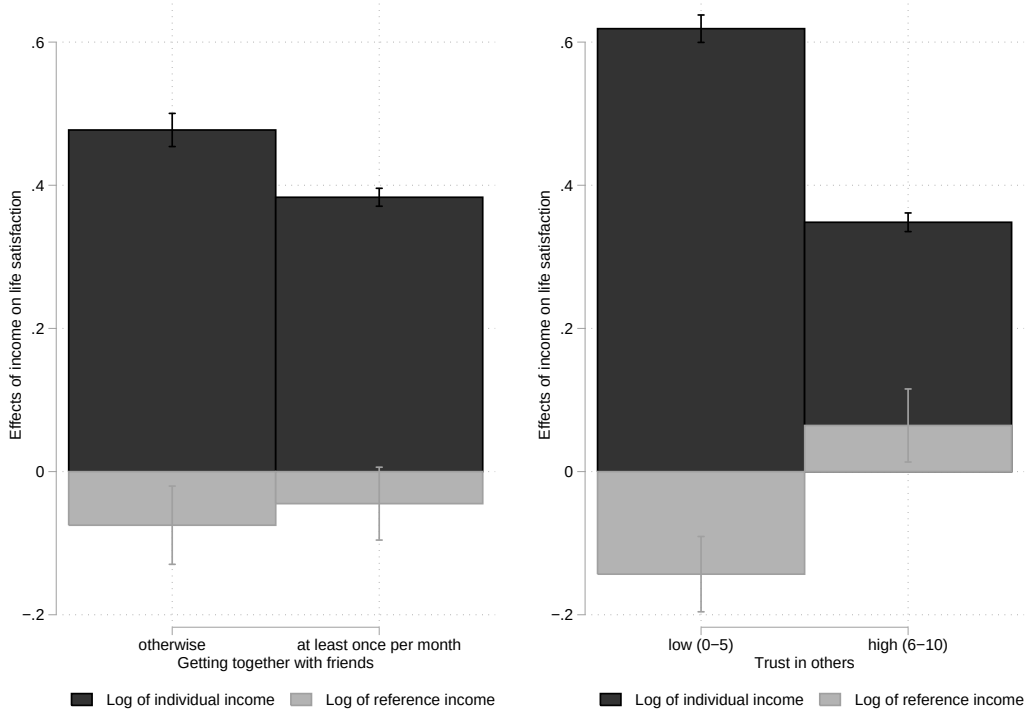
Note: OLS with robust standard errors. Dependent variable: Life satisfaction. Controls: sex, age group, marital status, education level, labour market status, house owner, country dummies. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

Table A4: Interacting social capital dummies: moderation effects (EU-SILC 2013).

	Getting together with friends	Trust in others
Log of individual income	**-20%**	**-44%**
Log of reference income	**-40%**	**-145%**

Note: Moderation effects express by how much the income coefficient is moderated for a given social capital dummy; the effects are calculated for specifications 1 and 2 from table A3.

Figure A1: Income effects moderated by higher social capital (EU-SILC 2013).



Note: Average marginal effects on the linear prediction of life satisfaction with 90% confidence intervals; calculated for specifications 1 and 2 from table A3.

ESS: Social Capital Index

Table A5: Main results (ESS 2012).

	(1)	(2)	(3)
Log of household income	0.460***	0.642***	0.458***
	(11.87)	(13.83)	(11.84)
Income rank 1-3	-0.157***	-0.156***	-0.294***
	(-3.77)	(-3.75)	(-4.62)
Income rank 8-10	0.148***	0.180***	0.392***
	(4.48)	(5.45)	(6.43)
Social capital index = 1 * Log of household income		-0.163***	
		(-4.49)	
Social capital index = 2 * Log of household income		-0.440***	
		(-10.64)	
Social capital index = 1 * Income rank 1-3			0.0966
			(1.47)
Social capital index = 1 * Income rank 8-10			-0.232***
			(-3.46)
Social capital index = 2 * Income rank 1-3			0.380***
			(5.42)
Social capital index = 2 * Income rank 8-10			-0.392***
			(-5.94)
Social capital index = 1	0.637***	1.779***	0.641***
	(21.96)	(6.67)	(15.12)
Social capital index = 2	1.140***	4.372***	1.109***
	(35.91)	(14.00)	(24.91)
Controls (socio-demographic, country)	Yes	Yes	Yes
Number of observations	35556	35556	35556
Adjusted R^2	0.299	0.302	0.301

Note: OLS with robust standard errors. Dependent variable: Life satisfaction. Omitted categories: "Income rank 4-7", "Social capital index = 0", "Social capital index = 0 * Log of household income" and "Social capital index = 0 * Income rank 4-7". Controls: sex, age, age squared, living with partner, living with children, years of education, labour market status, country dummies. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

ESS: Social Capital Dummies

Table A6: Interacting social capital dummies (ESS 2012).

	(1) SC = Meeting socially	(2) SC = Meeting socially	(3) SC = Social trust	(4) SC = Social trust
Log of household income	0.623*** (14.52)	0.488*** (12.46)	0.570*** (13.88)	0.475*** (12.19)
Income rank 1-3	-0.160*** (-3.80)	-0.288*** (-5.34)	-0.146*** (-3.49)	-0.226*** (-4.61)
Income rank 8-10	0.171*** (5.13)	0.291*** (6.42)	0.181*** (5.45)	0.278*** (6.31)
SC * Log of household income	-0.237*** (-8.10)		-0.249*** (-8.28)	
SC * Income rank 1-3		0.221*** (4.12)		0.213*** (4.10)
SC * Income rank 8-10		-0.207*** (-4.22)		-0.231*** (-4.92)
SC (main effect)	Yes	Yes	Yes	Yes
Controls (socio-demographic, country)	Yes	Yes	Yes	Yes
Number of observations	35556	35556	35556	35556
Adjusted R^2	0.283	0.282	0.295	0.294

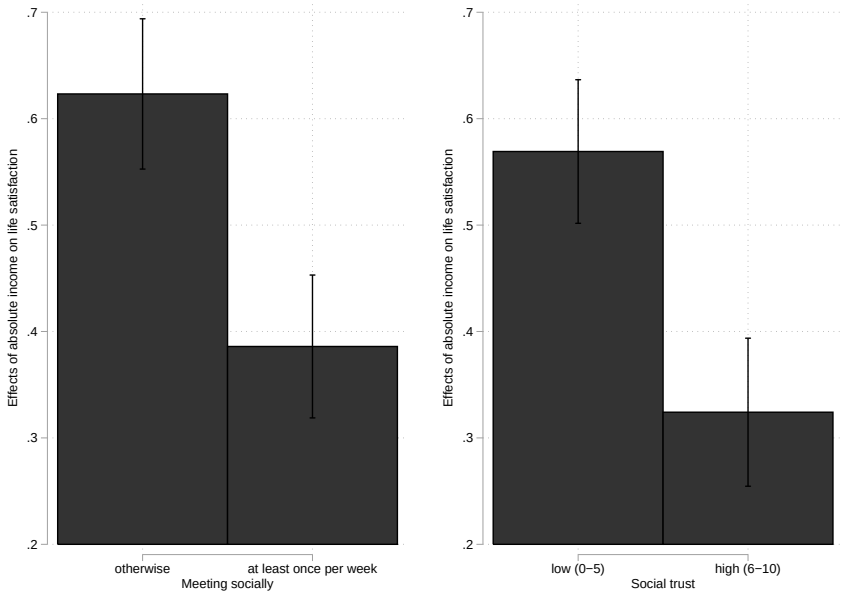
Note: OLS with robust standard errors. Dependent variable: Life satisfaction. Controls: sex, age, age squared, living with partner, living with children, years of education, labour market status, country dummies. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

Table A7: Interacting social capital dummies: moderation effects (ESS 2012).

	Meeting socially	Social trust
Log of household income	**-38%**	**-43%**
Income rank 1-3	**-77%**	**-94%**
Income rank 8-10	**-71%**	**-83%**

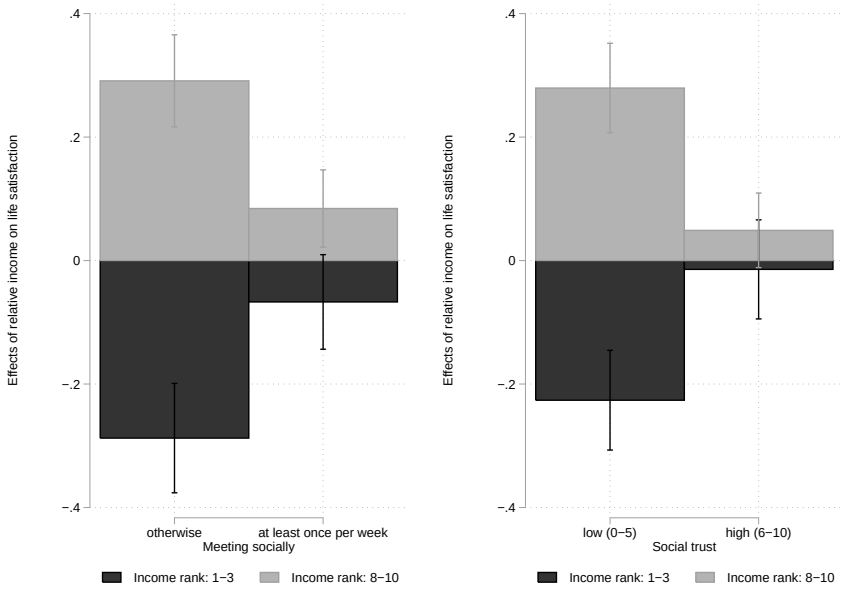
Note: Moderation effects express by how much the income coefficient is moderated for a given social capital dummy; the effects are calculated for specifications 1-4 from table A6.

Figure A2: Absolute income effects moderated by higher social capital (ESS 2012).



Note: Average marginal effects on the linear prediction of life satisfaction with 90% confidence intervals; calculated for specifications 1 and 3 from table A6.

Figure A3: Relative income effects moderated by higher social capital (ESS 2012).



Note: Average marginal effects on the linear prediction of life satisfaction with 90% confidence intervals; calculated for specifications 2 and 4 from table A6.

GSOEP: Social Capital Index

Table A8: Main results (GSOEP 1985-2011).

	(1) All	(2) All	(3) All	(4) West	(5) East
Log of individual income	0.389***	0.483***	0.500***	0.460***	0.622***
	(20.15)	(13.52)	(13.79)	(10.90)	(8.98)
Log of reference income	-0.358***	-0.360***	-0.651***	-0.726***	-1.302***
	(-3.45)	(-3.48)	(-4.72)	(-4.14)	(-4.42)
Social capital index = 1 * Log of individual income		-0.0776**	-0.0917**	-0.0787*	-0.151**
		(-2.19)	(-2.52)	(-1.89)	(-1.97)
Social capital index = 2 * Log of individual income		-0.116***	-0.142***	-0.134***	-0.159*
		(-3.12)	(-3.71)	(-3.09)	(-1.86)
Social capital index = 3 * Log of individual income		-0.205***	-0.235***	-0.233***	-0.235**
		(-4.77)	(-5.34)	(-4.65)	(-2.53)
Social capital index = 1 * Log of reference income			0.260**	0.250*	0.287
			(2.44)	(1.85)	(0.97)
Social capital index = 2 * Log of reference income			0.419***	0.390***	0.988***
			(3.74)	(2.78)	(3.17)
Social capital index = 3 * Log of reference income			0.477***	0.561***	0.901**
			(3.51)	(3.37)	(2.19)
Social capital index (main effect)	Yes	Yes	Yes	Yes	Yes
Controls (socio-demographic, region, year)	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	158587	158587	158587	123876	34711
Number of individuals	40919	40919	40919	32264	9158
R^2 within	0.0422	0.0425	0.0427	0.0479	0.0386
R^2 between	0.0490	0.0495	0.0500	0.0231	0.0535
R^2 overall	0.0458	0.0462	0.0466	0.0266	0.0511

Note: OLS with individual fixed effects (robust standard errors). Dependent variable: Life satisfaction. Omitted categories: "Social capital index = 0 * Log of individual income" and "Social capital index = 0 * Log reference income". Each equation includes the main effect of social capital index (three dummies). Controls: sex (omitted due to fixed effects), age, age squared, marital status, years of education, labour market status, house owner, living in East Germany, regional dummies, year dummies. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

Table A9: Changes of social capital (GSOEP 1985-2011).

	(1) *t-1*	(2) *t-2*	(3) *t-3*
Log of individual income	0.391*** (15.96)	0.368*** (12.85)	0.352*** (10.32)
Log of reference income	-0.585*** (-4.82)	-0.505*** (-3.72)	-0.531*** (-3.45)
SC index: negative change * Log of individual income	0.0342 (1.23)	0.0863*** (2.76)	0.0684* (1.78)
SC index: positive change * Log of individual income	-0.0702** (-2.57)	-0.0812** (-2.52)	-0.0996*** (-2.69)
SC index: negative change * Log of reference income	-0.172** (-2.09)	-0.314*** (-3.05)	-0.287** (-2.35)
SC index: positive change * Log of reference income	0.175** (2.13)	-0.0199 (-0.20)	-0.00645 (-0.05)
Social capital index change (main effect)	Yes	Yes	Yes
Controls (socio-demographic, region, year)	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes
Number of observations	119202	91738	68145
Number of individuals	30723	26136	20503
R^2 within	0.0391	0.0399	0.0452
R^2 between	0.0392	0.0385	0.0276
R^2 overall	0.0369	0.0414	0.0289

Note: OLS with individual fixed effects (robust standard errors). Dependent variable: Life satisfaction. Omitted categories: "Social capital index: no change * Log of individual income" and "Social capital index: no change * Log reference income". Each equation includes the main effect of social capital index changes (two dummies). Controls: sex (omitted due to fixed effects), age, age squared, marital status, years of education, labour market status, house owner, living in East Germany, regional dummies, year dummies. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

GSOEP: Social Capital Dummies

Table A10: Interacting social capital dummies (GSOEP 1985-2011).

	(1) SC = Social gathering	(2) SC = Helping friends	(3) SC = Performing volunteer work
Log of individual income	0.481*** (14.90)	0.433*** (19.93)	0.413*** (19.06)
Log of reference income	-0.588*** (-4.67)	-0.440*** (-4.08)	-0.451*** (-4.16)
SC * Log of individual income	-0.122*** (-3.99)	-0.103*** (-4.38)	-0.0836*** (-3.18)
SC * Log of reference income	0.285*** (3.22)	0.195*** (2.82)	0.224*** (2.79)
SC (main effect)	Yes	Yes	Yes
Controls (socio-demographic, region, year)	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes
Number of observations	158587	158587	158587
Number of individuals	40919	40919	40919
R^2 within	0.0424	0.0391	0.0378
R^2 between	0.0490	0.0407	0.0385
R^2 overall	0.0459	0.0386	0.0369

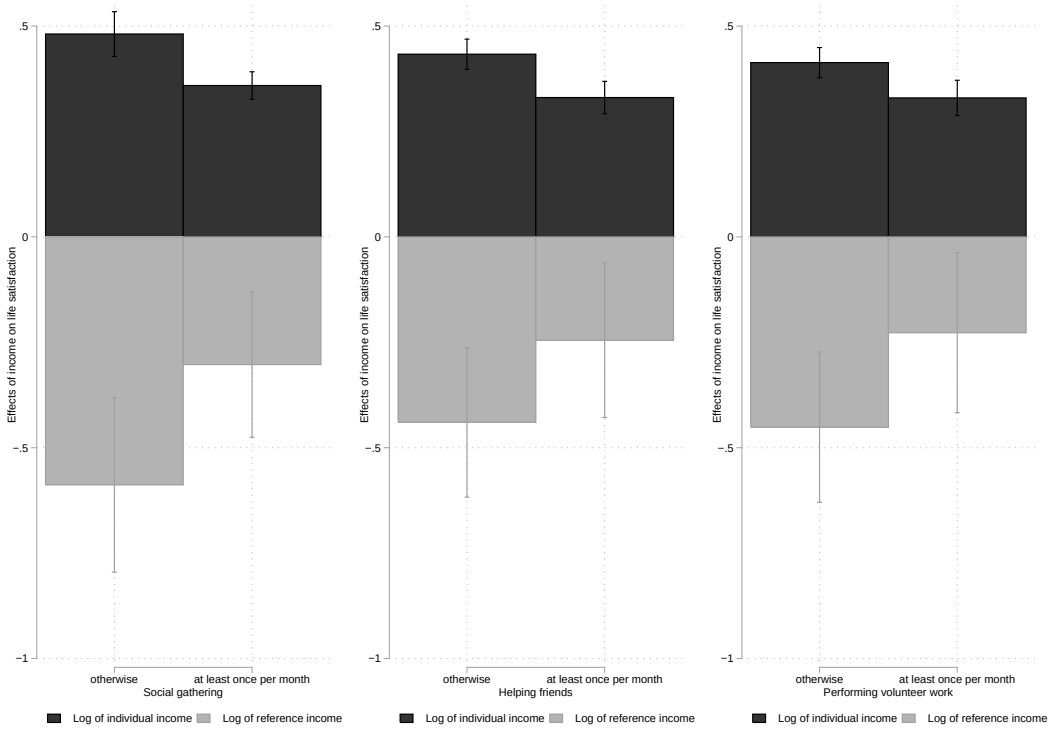
Note: OLS with individual fixed effects (robust standard errors). Dependent variable: Life satisfaction. Controls: sex (omitted due to fixed effects), age, age squared, marital status, years of education, labour market status, house owner, living in East Germany, regional dummies, year dummies. * p< 0.1, ** p< 0.05, *** p< 0.01, t statistics in parentheses.

Table A11: Interacting social capital dummies: moderation effects (GSOEP 1985-2011).

	Social gathering	Helping friends	Performing volunteer work
Log of individual income	**-25%**	**-24%**	**-20%**
Log of reference income	**-48%**	**-44%**	**-50%**

Note: Moderation effects express by how much the income coefficient is moderated for a given social capital dummy; the effects are calculated for specifications 1-3 from table A10.

Figure A4: Income effects moderated by higher social capital (GSOEP 1985-2011).



Note: Average marginal effects on the linear prediction of life satisfaction with 90% confidence intervals; calculated for specifications 1-3 from table A10.

A.1.2 Descriptive Statistics

EU-SILC

Table A12: Descriptive statistics (EU-SILC 2013).

Variable	Obs	Mean	Std. Dev.	Min	Max
Life satisfaction	324059	6.923	2.14	0	10
Individual income (EUR, EU28=100)	324059	1137.251	1256.401	0	110438.8
Log of individual income	324059	6.159	1.905	0	11.612
Reference income (EUR, EU28=100)	324059	1132.845	765.403	1.983	3120.429
Log of reference income	324059	6.309	1.822	1.093	8.046
Getting together with friends	324059	.731	.443	0	1
Trust in others	324059	.575	.494	0	1
Social capital index (0-2)	324059	1.306	.708	0	2
Social capital index = 0	324059	.144	.351	0	1
Social capital index = 1	324059	.405	.491	0	1
Social capital index = 2	324059	.451	.498	0	1
Female	324059	.55	.497	0	1
Under 26	324059	.096	.294	0	1
26-35	324059	.125	.331	0	1
36-45	324059	.168	.374	0	1
46-55	324059	.189	.392	0	1
Above 55	324059	.422	.494	0	1
Single	324059	.245	.43	0	1
Married	324059	.567	.495	0	1
Widowed	324059	.098	.297	0	1
Divorced or separated	324059	.089	.285	0	1
Primary education or no education	324059	.126	.332	0	1
Secondary education	324059	.629	.483	0	1
Tertiary education	324059	.245	.43	0	1
Working	324059	.475	.499	0	1
Unemployed	324059	.076	.264	0	1
Student	324059	.054	.227	0	1
Retired	324059	.279	.449	0	1
Not working	324059	.116	.321	0	1
House owner	324059	.561	.496	0	1
AT	324059	.03	.171	0	1
BE	324059	.03	.171	0	1
BG	324059	.027	.161	0	1
CH	324059	.038	.19	0	1
CY	324059	.031	.173	0	1
DE	324059	.058	.233	0	1
EE	324059	.03	.171	0	1
EL	324059	.042	.2	0	1
ES	324059	.064	.245	0	1
FI	324059	.031	.172	0	1
FR	324059	.045	.207	0	1
HR	324059	.021	.142	0	1
HU	324059	.054	.226	0	1
IE	324059	.018	.134	0	1
IS	324059	.009	.094	0	1
IT	324059	.076	.265	0	1
LT	324059	.024	.154	0	1
LU	324059	.017	.129	0	1
LV	324059	.03	.171	0	1
MT	324059	.021	.142	0	1
NL	324059	.03	.171	0	1
NO	324059	.018	.133	0	1
PL	324059	.067	.25	0	1
PT	324059	.027	.161	0	1
RO	324059	.037	.189	0	1
RS	324059	.035	.185	0	1
SE	324059	.018	.133	0	1
SK	324059	.034	.182	0	1
UK	324059	.039	.193	0	1

Table A13: Regions used to construct reference groups (EU-SILC 2013).

Variable	Obs	Mean	Std. Dev.	Min	Max
AT1	324059	.013	.112	0	1
AT2	324059	.006	.078	0	1
AT3	324059	.011	.106	0	1
BE	324059	.03	.171	0	1
BG3	324059	.014	.117	0	1
BG4	324059	.013	.112	0	1
CH0	324059	.038	.19	0	1
CY0	324059	.031	.173	0	1
DE	324059	.058	.233	0	1
EE0	324059	.03	.171	0	1
EL1	324059	.014	.117	0	1
EL2	324059	.011	.105	0	1
EL3	324059	.013	.112	0	1
EL4	324059	.004	.065	0	1
ES11	324059	.005	.069	0	1
ES12	324059	.002	.045	0	1
ES13	324059	.002	.042	0	1
ES21	324059	.004	.06	0	1
ES22	324059	.002	.048	0	1
ES23	324059	.002	.048	0	1
ES24	324059	.003	.056	0	1
ES30	324059	.006	.075	0	1
ES41	324059	.004	.066	0	1
ES42	324059	.003	.059	0	1
ES43	324059	.003	.052	0	1
ES51	324059	.007	.08	0	1
ES52	324059	.005	.07	0	1
ES53	324059	.002	.046	0	1
ES61	324059	.008	.088	0	1
ES62	324059	.003	.05	0	1
ES63	324059	.001	.024	0	1
ES64	324059	.001	.026	0	1
ES70	324059	.003	.052	0	1
FI19	324059	.008	.089	0	1
FI1B	324059	.008	.091	0	1
FI1C	324059	.006	.08	0	1
FI1D	324059	.008	.087	0	1
FR10	324059	.005	.069	0	1
FR21	324059	.001	.036	0	1
FR22	324059	.002	.041	0	1
FR23	324059	.001	.036	0	1
FR24	324059	.002	.044	0	1
FR25	324059	.001	.034	0	1
FR26	324059	.001	.038	0	1
FR30	324059	.004	.06	0	1
FR41	324059	.002	.045	0	1
FR42	324059	.001	.037	0	1
FR43	324059	.001	.028	0	1
FR51	324059	.003	.058	0	1
FR52	324059	.003	.052	0	1
FR53	324059	.002	.04	0	1
FR61	324059	.003	.053	0	1
FR62	324059	.002	.045	0	1
FR63	324059	.001	.026	0	1
FR71	324059	.004	.066	0	1
FR72	324059	.001	.033	0	1
FR81	324059	.002	.044	0	1
FR82	324059	.003	.053	0	1
FR83	324059	0	.011	0	1
HR0	324059	.021	.142	0	1
HU1	324059	.011	.106	0	1
HU2	324059	.014	.116	0	1
HU3	324059	.029	.168	0	1
IE0	324059	.018	.134	0	1
IS	324059	.009	.094	0	1
ITC	324059	.018	.134	0	1
ITF	324059	.016	.126	0	1
ITG	324059	.005	.073	0	1
ITH	324059	.019	.137	0	1
ITI	324059	.017	.131	0	1
LT0	324059	.024	.154	0	1
LU0	324059	.017	.129	0	1
LV0	324059	.03	.171	0	1
MT0	324059	.021	.142	0	1
NL	324059	.03	.171	0	1
NO0	324059	.018	.133	0	1
PL1	324059	.014	.119	0	1
PL2	324059	.012	.11	0	1
PL3	324059	.014	.118	0	1
PL4	324059	.01	.101	0	1
PL5	324059	.007	.081	0	1
PL6	324059	.009	.096	0	1
PT	324059	.027	.161	0	1
RO1	324059	.01	.101	0	1
RO2	324059	.01	.101	0	1
RO3	324059	.008	.091	0	1
RO4	324059	.008	.088	0	1
RS	324059	.035	.185	0	1
SE1	324059	.007	.084	0	1
SE2	324059	.008	.088	0	1
SE3	324059	.003	.056	0	1
SK0	324059	.034	.182	0	1
UKC	324059	.001	.038	0	1
UKD	324059	.004	.062	0	1
UKE	324059	.003	.052	0	1
UKF	324059	.002	.049	0	1
UKG	324059	.003	.055	0	1
UKH	324059	.003	.057	0	1
UKI	324059	.003	.055	0	1
UKJ	324059	.005	.07	0	1
UKK	324059	.003	.054	0	1
UKL	324059	.002	.042	0	1
UKM	324059	.006	.075	0	1
UKN	324059	.004	.061	0	1

Table A14: Descriptive statistics: macro variables (EU-SILC 2013).

Variable	Obs	Mean	Std. Dev.	Min	Max
LS gap between rich and poor	32	1.41	.498	.652	2.657
Trust in others (share of people with scores 6-10)	32	.59	.168	.275	.899
Gini index (for equivalised income)	32	.294	.039	.23	.367
GDP per capita (current prices, PPS per capita, in thousands)	32	27.05	12.005	10.1	70.5

ESS

Table A15: Descriptive statistics (ESS 2012).

Variable	Obs	Mean	Std. Dev.	Min	Max
Life satisfaction	35556	6.885	2.369	0	10
Household income (EUR, EU28=100)	35556	1974.286	1490.118	140.523	11781.15
Log of household income	35556	7.287	.836	4.945	9.374
Income rank 1-3	35556	.355	.478	0	1
Income rank 4-7	35556	.399	.49	0	1
Income rank 8-10	35556	.247	.431	0	1
Social trust	35556	.43	.495	0	1
Meeting socially	35556	.579	.494	0	1
Social capital index (0-2)	35556	1.009	.729	0	2
Social capital index = 0	35556	.261	.439	0	1
Social capital index = 1	35556	.469	.499	0	1
Social capital index = 2	35556	.27	.444	0	1
Female	35556	.527	.499	0	1
Age	35556	49.322	18.056	15	103
Age squared (divided by 100)	35556	27.587	18.328	2.25	106.09
Years of education	35556	12.654	4.126	0	51
Working	35556	.492	.5	0	1
Unemployed	35556	.075	.264	0	1
Student	35556	.069	.254	0	1
Retired	35556	.241	.428	0	1
Not working	35556	.122	.327	0	1
Living with partner	35556	.605	.489	0	1
Living with children	35556	.378	.485	0	1
AL	35556	.031	.172	0	1
BE	35556	.048	.213	0	1
BG	35556	.054	.227	0	1
CH	35556	.034	.182	0	1
CY	35556	.025	.156	0	1
CZ	35556	.037	.188	0	1
DE	35556	.071	.257	0	1
DK	35556	.033	.179	0	1
EE	35556	.055	.228	0	1
ES	35556	.044	.205	0	1
FI	35556	.058	.233	0	1
FR	35556	.05	.218	0	1
GB	35556	.05	.217	0	1
HU	35556	.039	.194	0	1
IE	35556	.054	.226	0	1
IS	35556	.017	.13	0	1
IT	35556	.015	.122	0	1
LT	35556	.048	.213	0	1
NL	35556	.044	.205	0	1
NO	35556	.044	.205	0	1
PL	35556	.041	.199	0	1
PT	35556	.028	.166	0	1
SE	35556	.047	.211	0	1
SI	35556	.026	.158	0	1
SK	35556	.003	.053	0	1

GSOEP

Table A16: Descriptive statistics (GSOEP 1985-2011).

Variable	Obs	Mean	Std. Dev.	Min	Max
Life satisfaction	158587	6.967	1.826	0	10
Individual income (2011 EUR)	158587	1682.892	1017.249	0	44728.43
Log of individual income	158587	7.311	.479	0	10.708
Reference income (2011 EUR)	158587	1677.146	251.864	1192.22	2243.969
Log of reference income	158587	7.414	.147	7.084	7.716
Social gathering	158587	.776	.417	0	1
Helping friends	158587	.399	.49	0	1
Performing volunteer work	158587	.277	.447	0	1
Social capital index (0-3)	158587	1.451	.913	0	3
Social capital index = 0	158587	.16	.366	0	1
Social capital index = 1	158587	.362	.481	0	1
Social capital index = 2	158587	.345	.475	0	1
Social capital index = 3	158587	.133	.34	0	1
Female	158587	.517	.5	0	1
Age	158587	46.891	17.219	16	101
Age squared (divided by 100)	158587	24.953	17.176	2.56	102.01
Single	158587	.22	.414	0	1
Married	158587	.64	.48	0	1
Widowed	158587	.066	.247	0	1
Divorced or separated	158587	.075	.264	0	1
Years of education	158587	11.592	2.638	7	18
Working	158587	.585	.493	0	1
Unemployed	158587	.054	.225	0	1
Student	158587	.029	.168	0	1
Retired	158587	.161	.367	0	1
Not working	158587	.172	.377	0	1
House owner	158587	.474	.499	0	1
East Germany	158587	.219	.413	0	1
Baden-Wuerttemberg	158587	.136	.342	0	1
Bavaria	158587	.142	.349	0	1
Berlin	158587	.038	.19	0	1
Brandenburg	158587	.037	.189	0	1
Bremen	158587	.008	.087	0	1
Hamburg	158587	.015	.122	0	1
Hesse	158587	.075	.264	0	1
Mecklenburg-Western Pomeran	158587	.022	.148	0	1
Lower Saxony	158587	.089	.284	0	1
North Rhine-Westphalia	158587	.209	.407	0	1
Rhineland-Palatinate	158587	.053	.225	0	1
Saarland	158587	.005	.072	0	1
Saxony	158587	.066	.248	0	1
Saxony-Anhalt	158587	.039	.194	0	1
Schleswig-Holstein	158587	.027	.162	0	1
Thuringia	158587	.04	.196	0	1
1985	158587	.065	.246	0	1
1986	158587	.057	.232	0	1
1988	158587	.055	.227	0	1
1992	158587	.073	.261	0	1
1994	158587	.07	.255	0	1
1996	158587	.07	.256	0	1
1997	158587	.069	.254	0	1
1999	158587	.081	.273	0	1
2005	158587	.119	.323	0	1
2007	158587	.119	.323	0	1
2009	158587	.117	.321	0	1
2011	158587	.106	.307	0	1

A.2 Appendix A.2: Methodology

A.2.1 Interpreting the Interaction Term Between a Categorical and a Continuous Variable (EU-SILC Specification)

Interacting a categorical variable with a continuous variable means that each category of the categorical one (treated as a dummy) is interacted with the continuous one. In case of equation 5 from section 2.3.1 (where *SC index* has three categories, each treated as a dummy variable: *SC index =0* - reference category, *SC index =1* and *SC index =2*), the estimated model takes the following form:

$$\begin{aligned} LS_i = \alpha_0 &+ \alpha_1 * log(Ind\ inc_i) + \alpha_2 * log(Ref\ inc_i) + \alpha_3 * (SC\ index\ =1)_i + \alpha_4 * (SC\ index\ =2)_i \\ &+ \alpha_{13} * (SC\ index\ =1)_i * log(Ind\ inc_i) + \alpha_{14} * (SC\ index\ =2)_i * log(Ind\ inc_i) \\ &+ \alpha_{23} * (SC\ index\ =1)_i * log(Ref\ inc_i) + \alpha_{24} * (SC\ index\ =2)_i * log(Ref\ inc_i) \\ &+ \boldsymbol{\gamma}' \boldsymbol{X}_i + \varepsilon_i. \end{aligned} \tag{14}$$

The equation may be rearranged into:

$$\begin{aligned} LS_i = \alpha_0 &+ [\alpha_1 + \alpha_{13} * (SC\ index\ =1)_i + \alpha_{14} * (SC\ index\ =2)_i] * log(Ind\ inc_i) \\ &+ [\alpha_2 + \alpha_{23} * (SC\ index\ =1)_i + \alpha_{24} * (SC\ index\ =2)_i] * log(Ref\ inc_i) \\ &+ \alpha_3 * (SC\ index\ =1)_i + \alpha_4 * (SC\ index\ =2)_i \\ &+ \boldsymbol{\gamma}' \boldsymbol{X}_i + \varepsilon_i. \end{aligned} \tag{15}$$

The marginal effect of $log(Ind\ inc)$ on LS changes with the level of *SC index* and will be equal to the expression:

$$\begin{aligned} \frac{\partial LS}{\partial log(Ind\ inc)} &= \alpha_1 + \alpha_{13} * (SC\ index\ =1) + \alpha_{14} * (SC\ index\ =2) \\ &= \begin{cases} \alpha_1, & \text{for } (SC\ index\ =0) = 1 \\ \alpha_1 + \alpha_{13}, & \text{for } (SC\ index\ =1) = 1 \\ \alpha_1 + \alpha_{14}, & \text{for } (SC\ index\ =2) = 1. \end{cases} \end{aligned} \tag{16}$$

Analogically, the marginal effect of $log(Ref\ inc)$ on LS will be equal to:

$$\begin{aligned} \frac{\partial LS}{\partial log(Ref\ inc)} &= \alpha_2 + \alpha_{23} * (SC\ index\ =1) + \alpha_{24} * (SC\ index\ =2) \\ &= \begin{cases} \alpha_2, & \text{for } (SC\ index\ =0) = 1 \\ \alpha_2 + \alpha_{23}, & \text{for } (SC\ index\ =1) = 1 \\ \alpha_2 + \alpha_{24}, & \text{for } (SC\ index\ =2) = 1. \end{cases} \end{aligned} \tag{17}$$

A.2.2 Instrumental Variables Estimation Using Heteroskedasticity-Based Instruments (EU-SILC Specification)

Social capital index is a categorical variable, thus it is necessary to instrument each category (dummy) and the interactions with each category; the list of the instrumented variables is thus the following:

- $SC\ index\ =1$,
- $SC\ index\ =2$,
- $(SC\ index\ =1) * log(Ind\ inc)$,
- $(SC\ index\ =2) * log(Ind\ inc)$,
- $(SC\ index\ =1) * log(Ref\ inc)$,
- $(SC\ index\ =2) * log(Ref\ inc)$.

First, I regress each of the above mentioned endogenous variables on the vector of controls $\boldsymbol{X}$ from equation 5:

$$(SC\ index\ =1)_i = a_1 + \boldsymbol{B}_1'\boldsymbol{X}_i + \epsilon_{1,i} \tag{18}$$

$$(SC\ index\ =2)_i = a_2 + \boldsymbol{B}_2'\boldsymbol{X}_i + \epsilon_{2,i} \tag{19}$$

$$(SC\ index\ =1)_i * log(Ind\ inc)_i = a_3 + \boldsymbol{B}_3'\boldsymbol{X}_i + \epsilon_{3,i} \tag{20}$$

$$(SC\ index\ =2)_i * log(Ind\ inc)_i = a_4 + \boldsymbol{B}_4'\boldsymbol{X}_i + \epsilon_{4,i} \tag{21}$$

$$(SC\ index\ =1)_i * log(Ref\ inc)_i = a_5 + \boldsymbol{B}_5'\boldsymbol{X}_i + \epsilon_{5,i} \tag{22}$$

$$(SC\ index\ =2)_i * log(Ref\ inc)_i = a_6 + \boldsymbol{B}_6'\boldsymbol{X}_i + \epsilon_{6,i}. \tag{23}$$

Second, I generate the instruments by multiplying the residuals from the "first stage equation" with each of the control variables in mean-centred form:

$$Z_{1,j} = (X_j - \overline{X}_j) * \hat{\boldsymbol{\epsilon}}_{\mathbf{1}} \tag{24}$$

$$Z_{2,j} = (X_j - \overline{X}_j) * \hat{\boldsymbol{\epsilon}}_{\mathbf{2}} \tag{25}$$

$$Z_{3,j} = (X_j - \overline{X}_j) * \hat{\boldsymbol{\epsilon}}_{\mathbf{3}} \tag{26}$$

$$Z_{4,j} = (X_j - \overline{X}_j) * \hat{\boldsymbol{\epsilon}}_{\mathbf{4}} \tag{27}$$

$$Z_{5,j} = (X_j - \overline{X}_j) * \hat{\boldsymbol{\epsilon}}_{\mathbf{5}} \tag{28}$$

$$Z_{6,j} = (X_j - \overline{X}_j) * \hat{\boldsymbol{\epsilon}}_{\mathbf{6}} \tag{29}$$

where j stands for the given control variable from vector $\boldsymbol{X}$. There are 41 control dummy variables (base levels not counted, see table A12), therefore $j = 1, 2, ..., 41$. Each of the 6 endogenous variables will thus have 41 instruments generated in the above described manner.

A.2.3 Instrumental Variables Estimation Using Heteroskedasticity-Based Instruments (Lewbel, 2012)

"Consider Y_1, Y_2 as observed endogenous variables, X a vector of observed exogenous regressors, and $\varepsilon = (\varepsilon_1, \varepsilon_2)$ as unobserved error processes. Consider a structural model of the form:

$$Y_1 = X'\beta_1 + Y_2\gamma_1 + \varepsilon_1 \tag{30}$$

$$Y_2 = X'\beta_2 + Y_1\gamma_2 + \varepsilon_2. \tag{31}$$

This system is triangular when $\gamma_2 = 0$ (or, with renumbering, when $\gamma_1 = 0$). Otherwise, it is fully simultaneous. The errors $\varepsilon_1, \varepsilon_2$ may be correlated with each other. If the exogeneity assumption, $E(\varepsilon X) = 0$ holds, the reduced form is identified, but in the absence of identifying restrictions, the structural parameters are not identified. These restrictions often involve setting certain elements of β_1 or β_2 to zero, which makes instruments available. In many applied contexts, the third assumption made for the validity of an instrument - that it only indirectly affects the response variable - is difficult to establish. The zero restriction on its coefficient may not be plausible. The assumption is readily testable, but if it does not hold, IV estimates will be inconsistent. Identification in Lewbel's approach is achieved by restricting correlations of $\varepsilon\varepsilon' X$ with X. This relies upon higher moments, and is likely to be less reliable than identification based on coefficient zero restrictions. However, in the absence of plausible identifying restrictions, this approach may be the only reasonable strategy. The parameters of the structural model will remain unidentified under the standard homoskedasticity assumption: that $E(\varepsilon\varepsilon' \mid X)$ is a matrix of constants. However, in the presence of heteroskedasticity related to at least some elements of X, identification can be achieved. In a fully simultaneous system, assuming that $cov(X, \varepsilon_j^2) \neq 0, j = 1, 2$ and $cov(Z, \varepsilon_1\varepsilon_2) = 0$ for observed Z will identify the structural parameters. Note that Z may be a subset of X, so no information outside the model specified above is required. The key assumption that $cov(Z, \varepsilon_1\varepsilon_2) = 0$ will automatically be satisfied if the mean zero error processes are conditionally independent: $\varepsilon_1 \perp \varepsilon_2 \mid Z = 0$. However, this independence is not strictly necessary. In the most straightforward context, we want to apply the instrumental variables approach to a single equation, but lack appropriate instruments or identifying restrictions. The auxiliary equation or 'first-stage' regression may be used to provide the necessary components for Lewbel's method. In the simplest version of this approach, generated instruments can be constructed from the auxiliary equations' residuals, multiplied by each of the included exogenous variables in mean-centered form:

$$Z_j = (X_j - \overline{X}) * \epsilon \tag{32}$$

where ϵ is the vector of residuals from the 'first-stage regression' of each endogenous regressor on all exogenous regressors, including a constant vector."[55]

[55]Source: Baum et al. (2012).

3 Importance of Income and Social Capital for Well-Being During Economic Shocks. The Case of Financial Crisis in Europe

> *The real question is: what price are we willing to pay for economic prosperity? If this price is the sacrifice of those things that are truly important to us, such as relationships, then the game of economic growth is not worth the candle of well-being. It is not so much development, but its social quality that matters for well-being.*
> – Stefano Bartolini

Abstract

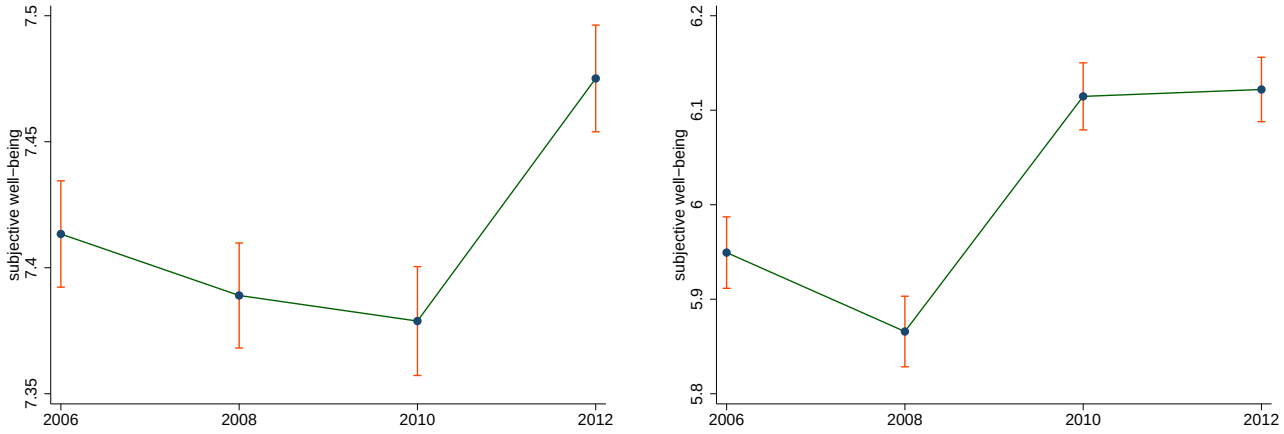
I compare the role of income and social capital for well-being in times of economic crisis in Europe. I use European Social Survey data from 2006 to 2012 to test the following hypothesis: i. social capital predicts well-being also in times of crisis; ii. the importance of material concerns increases, but the importance of other determinants of well-being does not change. Regression analysis with interaction effects and the Blinder-Oaxaca decomposition confirm the role of social capital for people's well-being thus supporting the view that also in times of crisis, when material concerns are urgent, policies for recovery should mind their effects for social capital.

3.1 Introduction

In this chapter I compare the role of income and social capital for well-being in times of economic crisis in Europe. My hypothesis is that social capital is relevant for people's well-being to face the economic crisis. Thus, even though material concerns are urgent, policies for recovery should mind their effects on social capital.

The sudden and unexpected economic crisis – that started in US in the late 2007 and spread rapidly all over the world in 2008 – affected the well-being of people in Western and Eastern Europe (see figure 5).

Figure 5: Trends of well-being between 2006 and 2012.



Western European countries

Eastern European countries

Previous studies on the trends of well-being suggests that in the short run income changes have a major impact on the changes of well-being compared to other factors, such as social capital (Bartolini and Sarracino, 2014; Easterlin et al., 2010). This suggests that lower levels of income associated to an increase in the importance of income for well-being explain the decreasing well-being of Europeans. What does happen to the other predictors of well-being, such as social capital? The OECD (2001, p. 41), consistently with Putnam (2000), defines social capital (SC) as "networks together with shared norms, values and understandings that facilitate co-operation within or among groups". Previous studies documented that social capital is an important correlate of well-being (Becchetti et al., 2009, 2011; Helliwell, 2001, 2006, 2007; Helliwell and Wang, 2011; Helliwell and Putnam, 2004) and a powerful predictor of its changes over time (Bartolini and Sarracino, 2014). Social capital has a number of real-life, positive effects besides well-being. For example, it is an ingredient of economic growth (Arrow, 1972; Knack and Keefer, 1997) as well as of good health (Berkman and Syme, 1979; Danner et al., 2001; House et al., 1982; Wilson et al., 2007). But in times of crisis social capital represents also an informal safety net to which people can resort in case of need. In principle the buffering effect of social capital should, at least in part, compensate for the loss of well-being and ease the negative effects of the crisis. Yet, while previous literature focused on how the crisis has affected social capital and income, little attention has been dedicated to the importance of income and social capital for well-being during the 2008 economic crisis. Present study addresses this issue adopting the European Social Survey data from 2006 to 2012. I adopt Blinder-Oaxaca decomposition to explain the well-being gap associated with the

economic crisis in Western and Eastern Europe. To check whether the determinants of well-being change during the crisis, and whether such changes are persistent, I adopt a regression analysis with interaction effects.

This chapter is organized as follows: section 3.2 summarizes previous studies and illustrates the original contribution of this study. Section 3.3 describes the data available for present study, introduces the relevant variables and provides some descriptive statistics about the trends and levels of well-being in Europe. Section 3.4 presents the methods adopted to test my hypothesis, while section 3.5 shows the results. Section 3.6 briefly summarizes the main findings and provides some policy suggestions.

3.2 Literature Review

Previous studies extensively documented the role of income, health, education, social capital and many other components of subjective well-being (Diener and Suh, 1997; Dolan et al., 2008; Layard, 2005; Powdthavee, 2010). In particular, there are little doubts that both income and social capital, measured as trust in others and frequency of social meetings, positively correlate with subjective well-being (Becchetti et al., 2009, 2011; Diener et al., 1993; Diener and Seligman, 2009; Helliwell and Wang, 2011; Helliwell and Putnam, 2004). Yet, such associations may vary over time. For instance, it is plausible that in times of hardship material concerns become urgent, while other issues, such as social capital, lose importance. This is the reason why, in times of crises, policy makers make every effort to promote a fast economic recovery: the sooner the economy recovers, the faster people's material needs are secured, and the less people's well-being is hampered.

A first source of information in this regard is a combined study of European Quality of Life Survey (EQLS) and Eurobarometer data showing that the 2008 crisis brought about a decline in quality of life – both in terms of living standards and of material deprivation. In particular, as far as social capital is concerned, various indicators of trust exhibited a drop in the first phase of the crisis (2007-2009) followed by a subsequent recovery (Eurofound, 2012a).

Two years later, Eurofound (2014) published a second more detailed study on how the crisis affected the lives of European residents. Using data from the third European Quality of Life Survey, performed in 27 Member States between 2011 and 2012, investigated how the crisis affected several indicators of quality of life, including: subjective well-being (SWB), living standards and deprivation, employment and work-life balance, family and social life, social exclusion and community involvement, housing and local environment, public services and healthcare, quality of society.

The study documents that indicators of the overall well-being, such as life satisfaction, happiness and feeling of optimism, declined mostly in the countries which were more affected by the crisis in terms of unemployment and GDP per capita. Still, the decline in life satisfaction related to the crisis is moderate compared to the decline in both happiness and optimism, which decreased in nearly all EU countries over the four years around the crisis (2007-2011). As far as the satisfaction with different aspects of life is concerned, the only domains exhibiting a decline at the EU level is family life (Eurofound, 2014). Likewise, the economic crisis affected the objective indicators of quality of life. Between 2007-2011 the standard of living in the

EU worsened: in virtually all Member States the share of people reporting difficulties making ends meet increased and so did the index of material deprivation. What is more, the economic difficulties negatively affected the housing security: (i) the proportion of Europeans who "report having been unable in the 12 months preceding the survey to pay a scheduled rent or mortgage payment for accommodation" increased from 8% in 2007 to 11% in 2011"; (ii) the proportion of Europeans who "find it quite or very likely they will need to leave their accommodation within the next six months because they can no longer afford it" increased from 4% in 2007 to 6% in 2011.

As far as the social capital indicators are concerned, Eurofound (2012b) provides numerous insights about Europeans' social life, trust in others, trust in institutions, and political involvement. Between 2007-2011 there has been a decline in the frequency of face-to-face contacts with family and friends (the same holds for telephone or mail contacts). Trust in others decreased in the first phase of the crisis (2007-2009) to rise in the following years (2010 and 2011). On the contrary, trust in public institutions (governments and parliaments at national level) has been constantly declining between 2007 and 2011 "possibly reflecting scepticism or perceived lack of success in dealing with the economic crisis". These results are further confirmed by Polavieja (2013).

Using 2004-10 data from EU Labour Force Survey (EU-LFS) and ESS for 19 European countries, Gallie (2013a) documented that the 2008 crisis negatively affected the quality of work and, in turn, eroded social inclusion through increased job insecurity and decreased trust in democratic and political processes (see also Gallie, 2013b). Additionally, while the quality of work worsened, another study by Russell (2013) documented that work-family conflicts have moderately increased between 2004 and 2010. The author identifies various possible explanations, such as the rise in work pressure, the rise in unsocial hours and working overtime at short notice, as well as the rise in job insecurity.

Helliwell et al. (2014) deal in more detail with the role of social capital in times of crises. Notably, the authors use a panel of transition and non-transition countries from European Social Survey Rounds 1 to 5 and they found that between 2006 and 2010 social trust, trust in police, and trust in the legal system have all fallen in the non-transition economies and risen in the transition economies. Results also show that in non-transition countries, the variation of GDP per capita is associated with a significant variation of subjective well-being, while the role of social trust for well-being seems negligible. The opposite takes place for transition countries: the authors found a significant relation between the change of subjective well-being and the change of social trust, but not that of GDP per capita. This result leads the authors to conclude that in European transition economies social trust, an indicator of the country's social capital, affects happiness directly, thus allowing "a softer landing in the face of external economic shocks". In other words, Helliwell et al. (2014) document that in times of crisis economic growth and well-being are positively associated in Western European countries, while in European transition economies they identify and a positive association between social capital and well-being.

This conclusion is partly confirmed by Welsch and Kühling (2016) who studied how changes in economic growth, unemployment rate, and inflation affected people's subjective well-being

during the 2008 financial crisis. Results suggest that, in the countries most strongly affected by the crisis, the effects of the three macro-economic variables on subjective well-being have a magnitude comparable to that of most serious personal life events.

To sum up previous studies documented that in times of crisis material concerns, such as economic growth, unemployment, and inflation become particularly important for people's well-being, whereas the role of social capital seems more controversial. Additionally, previous literature agrees in documenting an overall decrease of various forms of social capital in correspondence with the crisis. However, previous studies did not study how the importance of income and social capital has changed during the crisis. This is an important issue because neglecting how the crisis affects people's determinants of well-being, may lead to misleading policy indications. For instance, economic policies for fast recovery may impose a high toll on quality of work or on interpersonal relationships, including work-family life, thus hampering people's well-being. This chapter addresses this issue testing the following hypothesis:

1. Social capital predicts well-being also in times of crisis.

2. Despite the increase of material concerns, the importance of other determinants of well-being does not change.

3.3 Data and Descriptive Statistics

The European Social Survey (ESS) is a source of reliable data on people's well-being, values and attitudes in Europe. It is administered regularly every 2 years since 2002 on a large sample of countries. This feature makes ESS a useful source of data for the present study because it provides, among others, information about social capital and well-being in Western and Eastern European countries at regular intervals over time. Specifically, present work exploits the data from 2006 to 2012 to cover the period of the economic crisis.

Table 17 summarizes the cross-country and years availability of observations. The sample includes 22 countries for a total of 168,357 observations. I distinguish Western from Eastern European countries because, as illustrated in figure 5, the changes in well-being in the two groups of countries have different patterns.

I measure people's well-being through answers to the questions on happiness and life satisfaction available in the ESS. The wording of the life satisfaction question is: "all things considered, how satisfied are you with your life as a whole these days?". Answers range on an eleven point scale in which 0 means 'extremely dissatisfied' and 10 means 'extremely satisfied'. The wording of the happiness question is: "taking all things together, how happy would you say you are?". Also in this case the possible answers range from 0 ("extremely unhappy") to 10 ("extremely happy"). Given the similarities between these two variables, I built a synthetic indicator of well-being averaging the scores from the two questions.[56]

The ESS provides the following variables which are usually considered proxies of social capital (Costa and Kahn, 2003; Paxton, 1999):

[56]Before creating the index, I performed a factor analysis to check that the factor loadings are comparable. More details are available in table B3 in appendix B.1.

- **Trust in others:** respondents have been asked to rate their perceptions about whether most people can be trusted or not, whether other people try to take advantage of them and whether they try to be helpful or rather looking for themselves. Each of these three questions ranges on a 0 to 10 scale, where the lowest category corresponds to the worst judgment and the highest to the best one. Given the similarities among these three questions, both in terms of wording and in terms of substantive meaning, I run a factor analysis to check whether they could be grouped to proxy one latent concept.[57] Factor loadings confirm that the three variables mirror the same fundamental concept, i.e. social trust. Hence, I built an indicator of social trust averaging the scores from the three questions.
- **Confidence in institutions:** respondents have been asked whether they trust the Parliament, the legal system and the police. Also these questions range on a 0 to 10 scale, where the lowest category corresponds to the worst judgement and the highest to the best one. Also in this case I built an indicator of confidence in institutions averaging the scores from the three questions.[58]
- **Having someone to discuss:** I measure the availability and quality of social relationships through answers to the following question: "Do you have anyone with whom you can discuss intimate and personal matters?". Answers are re-coded as zero if the respondent declares that he/she has no one to discuss intimate matters, one otherwise.
- **Social gatherings:** I measure the intensity of meeting and spending time socially with other people with answers to the question: "How often do you meet socially with friends, relatives or work colleagues?". The answers are coded on a seven points scale from 1 ('never') to 7 ('every day'). The answers have been re-coded as zero if the respondent declares to meet others less than several times a month, and one if he/she declares to meet others at least once a week.

Two further key variables are household income and financial dissatisfaction. Income is measured with an ordered scale of income intervals. Each respondent has been imputed the average income of the interval to which he/she declared to belong. To account for the non-linear relationship between income and well-being, this variable has been converted in logarithm. Financial dissatisfaction is observed after inverting the scale of answers to the question: "how you feel about your household's income nowadays?". After re-coding, the answers range on a 4 points scale where higher numbers stand for greater dissatisfaction. D'Ambrosio and Frick (2007) and D'Ambrosio and Frick (2012) show in a panel analysis that dissatisfaction is predicted by a measure of relative deprivation taking into account both the income rank and the distance among incomes. This supports the interpretation that, after controlling for income, financial dissatisfaction is shaped by relative and not absolute standards, thus reflecting social comparisons, i.e. individual achievements with respect to what other people – with whom the respondent compares herself – get.

Following a well-established literature on well-being studies, I included a large set of socio-demographic control variables such as age, age squared, gender, marital and occupational status,

[57] For more details see table B1 in appendix B.1.
[58] For more details see table B2 in appendix B.1.

education, religious involvement, size of place where the respondent leaves and a set of dummies to control for country unobserved heterogeneity (Dolan et al., 2008; Powdthavee, 2010).

Table 18 provides the complete list of the variables included in present work along with their mean, standard deviations, minimum and maximum values, number of observations and percentages of missing data. Table 19 details the percentage of missing data by year. The percentages of missing data are small enough to rule out the risk of biased estimates (Allison, 2001; Schafer, 1997, 1999).

After computing the average score of well-being for each country and year, it is possible to rank countries from the one where well-being is highest to the lowest. Table 20 shows unsurprisingly that in 2006 the five happiest countries included four Scandinavian ones and Switzerland, whereas the bottom five countries include Portugal and four transition countries: Hungary, Russian Federation, Ukraine and Bulgaria. Remarkably, even though the crisis affected people's well-being, it did not alter the ranking. As confirmed by the Spearman (table 21) and Kendall (table 22) rank test, the ranking did not significantly change from one year to the other.

Table 23 reports the changes in average well-being from one year to the following one, assuming 2006 as the base year. The last column of the table shows the overall change from 2006 to 2012. The table mirrors the trends illustrated in figure 5: Eastern countries are characterized by a sudden decrease in well-being followed by a fast recovery: by 2010 Eastern countries had recovered to their pre-crisis level of well-being. Western countries are characterized by a less steep, but more durable decrease of well-being which lasts until 2010, before recovering.

Figures 6 and 7 illustrates the standard deviation of well-being by country and year. The figure shows that, among Western countries, well-being inequality increased in Cyprus and Spain, whereas Portugal, Ireland and Finland reported only temporary increases of inequality. The years of the economic crisis brought a decrease in well-being inequality in Germany and Norway. Results are more straightforward for Eastern European countries where inequality increased only in Bulgaria and Estonia. On the contrary, it decreased in 5 out of 8 countries, namely Hungary, Poland, Russian Federation, Slovakia and Ukraine.

Table 17: Number of observations by country and year.

Country	Acronym	2006	2008	2010	2012	Total
Belgium	BE	1798	1760	1704	1869	7131
Bulgaria	BG	1400	2240	2434	2260	8334
Switzerland	CH	1804	1819	1506	1493	6622
Cyprus	CY	995	1225	1083	1116	4419
Germany	DE	2916	2751	3031	2958	11656
Denmark	DK	1505	1610	1576	1650	6341
Estonia	EE	1517	1661	1793	2380	7351
Spain	ES	1876	2576	1885	1889	8226
Finland	FI	1896	2195	1878	2197	8166
France	FR	1986	2073	1728	1968	7755
Great Britain	GB	2394	2352	2422	2286	9454
Hungary	HU	1518	1544	1561	2014	6637
Ireland	IE	1800	1764	2576	2628	8768
Netherlands	NL	1889	1778	1829	1845	7341
Norway	NO	1750	1549	1548	1624	6471
Poland	PL	1721	1619	1751	1898	6989
Portugal	PT	2222	2367	2160	2151	8900
Russian Fed.	RU	2437	2512	2595	2484	10028
Sweden	SE	1927	1830	1497	1847	7101
Slovenia	SI	1476	1286	1403	1257	5422
Slovakia	SK	1766	1820	1856	1847	7289
Ukraine	UA	2002	1845	1931	2178	7956
Total		40595	42176	41747	43839	168357

Table 18: Descriptive statistics.

variable	mean	sd	min	max	obs	missing (%)
index of well-being	6.917	2.072	0	10	168130	0.135
Age of respondent, calculated	48.03	18.45	14	105	165904	1.46
age squared / 100	26.47	18.42	1.960	110.3	165904	1.46
male	0.456	0.498	0	1	168184	0.103
separated	0.0110	0.105	0	1	163571	2.84
divorced	0.0887	0.284	0	1	163571	2.84
widowed	0.105	0.306	0	1	163571	2.84
never married	0.274	0.446	0	1	163571	2.84
children living at home	0.374	0.484	0	1	167996	0.214
employed	0.490	0.500	0	1	167437	0.546
in education	0.0811	0.273	0	1	167437	0.546
unemployed	0.0588	0.235	0	1	167437	0.546
sick or disabled	0.0245	0.155	0	1	167437	0.546
retired	0.250	0.433	0	1	167437	0.546
civil/military service	0.00114	0.0338	0	1	167437	0.546
housework	0.0838	0.277	0	1	167437	0.546
other	0.0107	0.103	0	1	167437	0.546
Years of full-time education completed	12.32	4.135	0	56	166824	0.911
Number of people living regularly as member of hou	2.687	1.369	1	7	168160	0.117
ln of household income	9.425	1.555	1.470	11.81	124426	2.61
financial dissatisfaction	1.125	0.909	0	3	166636	1.02
index of social trust	5.131	1.997	0	10	168103	0.151
index of confidence	4.964	2.339	0	10	167108	0.742
having someone to discuss intimate things	0.917	0.277	0	1	166466	1.12
social gathering	0.613	0.487	0	1	167467	0.529
attending religious services	2.572	1.511	1	7	167089	0.753
a big city	0.208	0.406	0	1	167895	0.274
suburbs of big city	0.114	0.318	0	1	167895	0.274
town or small city	0.308	0.462	0	1	167895	0.274
country	–	–	2	28	168357	0

Table 19: Percentage of missing data by year.

variable	2006	2008	2010	2012	total
index of well-being	0.168	0.156	0.0982	0.119	168130
Age of respondent, calculated	1.77	1.35	1.36	1.36	165904
age squared / 100	1.77	1.35	1.36	1.36	165904
male	0.239	0.116	0.0551	0	168184
separated	0.658	4.60	5.16	0.972	163571
divorced	0.658	4.60	5.16	0.972	163571
widowed	0.658	4.60	5.16	0.972	163571
never married	0.658	4.60	5.16	0.972	163571
children living at home	0.488	0.299	0.0719	0.0160	167996
employed	0.589	0.415	0.240	0.926	167437
in education	0.589	0.415	0.240	0.926	167437
unemployed	0.589	0.415	0.240	0.926	167437
sick or disabled	0.589	0.415	0.240	0.926	167437
retired	0.589	0.415	0.240	0.926	167437
civil/military service	0.589	0.415	0.240	0.926	167437
housework	0.589	0.415	0.240	0.926	167437
other	0.589	0.415	0.240	0.926	167437
Years of full-time education completed	1.24	0.854	1.01	0.566	166824
Number of people living regularly as member of house	0.158	0.156	0.113	0.0456	168160
ln of household income	3.05	3.26	2.30	1.88	124426
financial dissatisfaction	1.16	0.991	0.975	0.969	166636
index of social trust	0.217	0.154	0.129	0.107	168103
index of confidence	0.909	0.645	0.752	0.671	167108
having someone to discuss intimate things	1.17	0.989	1.09	1.25	166466
social gathering	0.594	0.562	0.407	0.552	167467
attending religious services	0.751	0.906	0.637	0.719	167089
a big city	0.365	0.432	0.194	0.116	167895
suburbs of big city	0.365	0.432	0.194	0.116	167895
town or small city	0.365	0.432	0.194	0.116	167895
country	0	0	0	0	168357

Table 20: Ranking of well-being by year among European countries.

Country	2006	2008	2010	2012
DK	1	1	1	1
CH	2	4	2	3
FI	3	2	4	4
SE	4	5	5	5
NO	5	3	3	2
IE	6	9	15	14
NL	7	6	6	6
CY	8	10	11	13
BE	9	7	7	7
ES	10	8	8	10
GB	11	11	9	9
SI	12	12	13	12
DE	13	13	10	8
PL	14	14	12	11
FR	15	15	16	15
EE	16	17	14	17
SK	17	16	17	16
PT	18	18	18	18
HU	19	20	19	20
RU	20	19	20	19
UA	21	22	21	21
BG	22	21	22	22

Table 21: Spearman's rank test of well-being across years.

	2006	2008	2010	2012
2006	1.0000			
	22			
2008	0.9785	1.0000		
	22	22		
	0.0000			
2010	0.9277	0.9560	1.0000	
	22	22	22	
	0.0000	0.0000		
2012	0.9164	0.9526	0.9831	1.0000
	22	22	22	22
	0.0000	0.0000	0.0000	

Table 22: Kendall's rank test of well-being across years.

	2006	2008	2010	2012
2006	1.0000			
	22			
2008	0.9048	1.0000		
	22	22		
	0.0000			
2010	0.8442	0.8528	1.0000	
	22	22	22	
	0.0000	0.0000		
2012	0.7922	0.8528	0.9134	1.0000
	22	22	22	22
	0.0000	0.0000	0.0000	

Table 23: Well-being changes among years.

Country	2006	2006-2008	2008-2010	2010-2012	2006-2012
DK	0.00	0.04	-0.14	0.17	0.08
CH	0.00	-0.12	0.17	0.04	0.09
FI	0.00	-0.02	-0.03	0.15	0.10
SE	0.00	-0.02	0.06	-0.06	-0.01
NO	0.00	0.09	0.04	0.18	0.30
IE	0.00	-0.25	-0.69	0.24	-0.71
NL	0.00	0.10	0.07	0.05	0.23
CY	0.00	-0.31	-0.02	-0.17	-0.51
BE	0.00	-0.08	0.21	-0.10	0.03
ES	0.00	-0.10	0.01	-0.21	-0.30
GB	0.00	-0.05	0.03	0.14	0.11
SI	0.00	-0.03	0.04	-0.01	0.01
DE	0.00	0.15	0.22	0.32	0.70
PL	0.00	0.19	0.15	0.06	0.40
FR	0.00	-0.05	-0.08	0.19	0.05
EE	0.00	-0.12	0.26	-0.22	-0.08
SK	0.00	0.20	0.04	0.07	0.31
PT	0.00	0.09	0.21	-0.03	0.26
HU	0.00	-0.14	0.50	-0.28	0.08
RU	0.00	0.15	0.17	0.14	0.46
UA	0.00	-0.26	0.44	0.44	0.62
BG	0.00	-0.18	0.34	-0.29	-0.13

Figure 6: Standard deviation of well-being by year: Western countries.

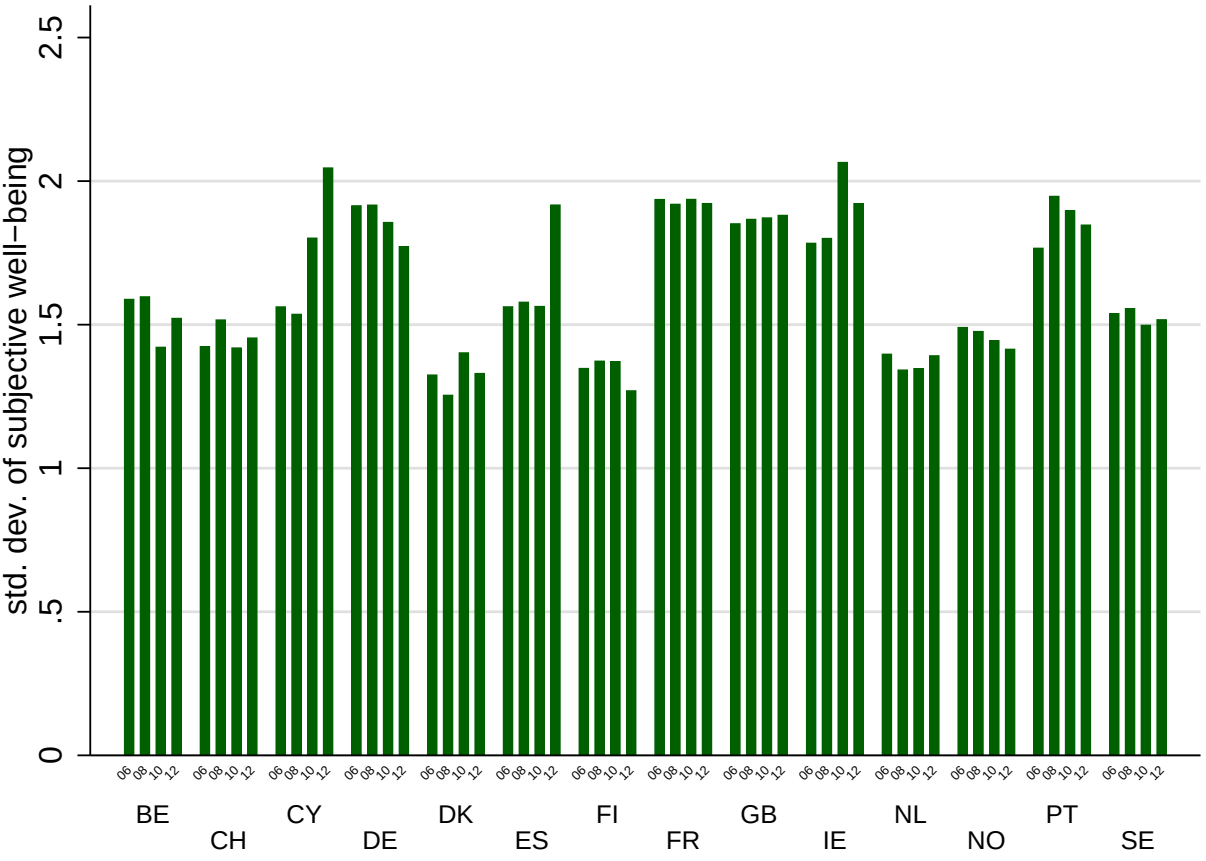
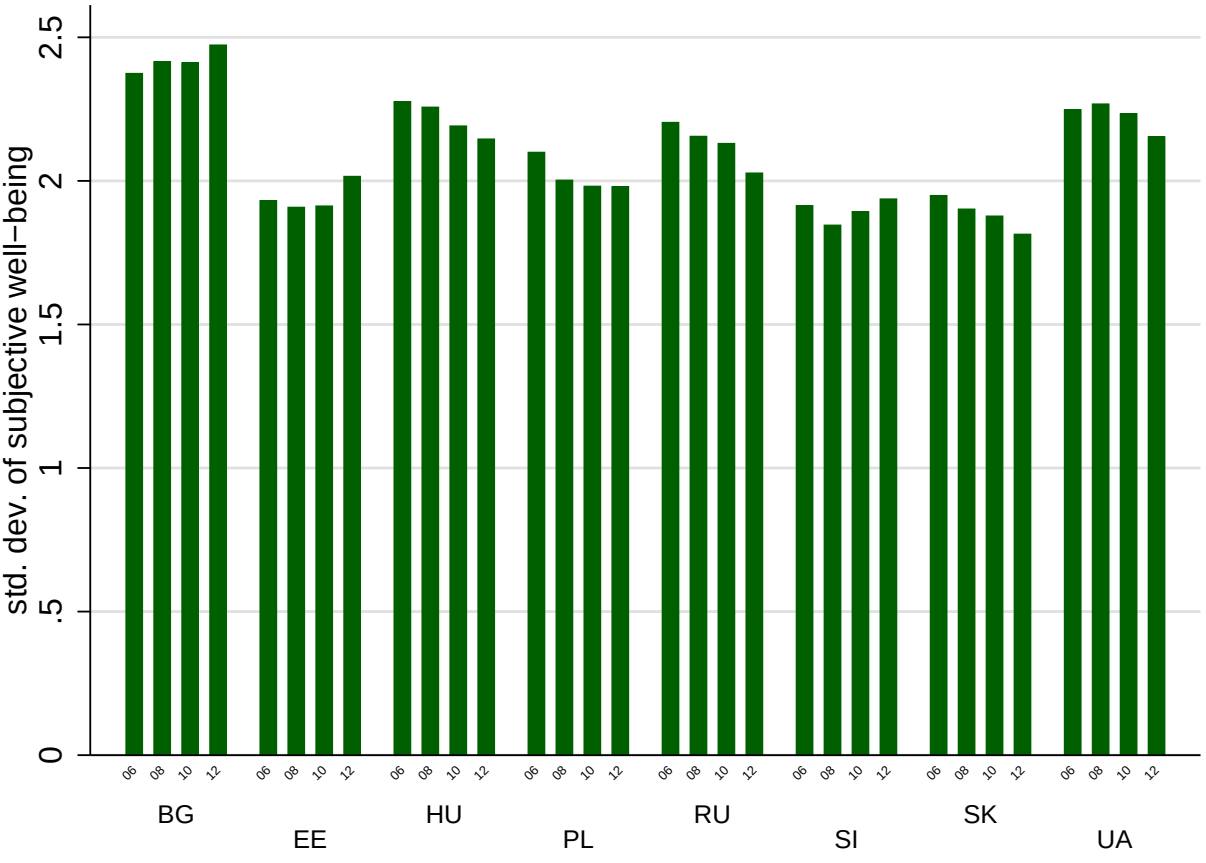


Figure 7: Standard deviation of well-being by year: Eastern countries.



3.4 Methodology

To test the hypothesis that social capital matters for well-being also during an economic crisis, I adopt a Blinder-Oaxaca decomposition. To address the second hypothesis, namely that the determinants of well-being do not change during a crisis, I adopt a regression analysis with interaction terms. Below I detail the methodological aspects of my strategy.

3.4.1 Blinder-Oaxaca Decomposition

The Blinder-Oaxaca decomposition allows us to decompose the well-being gap between the initial and the final year of observations and to identify the extent to which changes over time in the levels and in the coefficients of life satisfaction regressors explain the well-being gap.

The Blinder-Oaxaca decomposition has been developed in the early '70s by Oaxaca (1973) and Blinder (1973) to study discrimination between men and women in the labour market. Recently, it has been applied also in other fields, including the literature on subjective well-being (Bartolini and Sarracino, 2015; Becchetti et al., 2010; Brockmann et al., 2009; Helliwell and Barrington-Leigh, 2010; Sarracino, 2013).

The decomposition method allows us to study group differences in an outcome variable by dividing its differential in two parts: the *explained* one, accounting for differences in observed characteristics of the population and the *unexplained* one, measuring the differences in the coefficients between two groups. The latter is generally considered a discrimination measure (Jann, 2008). For the purpose of the present work, the decomposition allows to identify how much of the overall differential in the average subjective well-being between two years can be ascribed to differences in the set of characteristics as presented in equation 33 (the explained part) and to differences in how these characteristics are evaluated (the unexplained part).

The ordered nature of the dependent variable requires ordered probit or logit techniques. However, I adopt a linear model for ease of computation and comparison of the coefficients across years. Moreover, the literature on subjective well-being demonstrated that, when the dependent variable has a sufficient number of categories, linear models provide results equivalent to their ordered counterparts. In particular, Ferrer-i-Carbonell and Frijters (2004) conclude that assumptions on ordinality or cardinality of the answers to a subjective well-being question are "relatively unimportant to results"[59].

A downside of the Blinder-Oaxaca approach is that the unexplained part captures also the potential effects of differences in any unobserved variables (Jann, 2008).

Formally, the decomposition is as follows:

$$\Delta LS = \underbrace{[E(X_{fy}) - E(X_{iy})]' \cdot \beta^*}_{explained} + \underbrace{[E(X_{fy})' \cdot (\beta_{fy} - \beta^*) + E(X_{iy})' \cdot (\beta^* - \beta_{iy})]}_{unexplained} \qquad (33)$$

where ΔLS is the difference in average subjective well-being between the final (fy) and the initial (iy) year of observations, $E(X)$ is the yearly average of a vector of explanatory variables measured at the beginning and at the end of the period of observation, β_{fy} and β_{iy} are vectors of coefficients and β^* is a vector of *non-discriminatory* coefficients to quantify how much each

[59] Ferrer-i-Carbonell and Frijters (2004)

group of variables explains the overall difference of means. The vector of explanatory variables includes the predictors of well-being described in section 3.3.

I run the decomposition for Western and Eastern countries separately to account for the different shape of the changes of well-being over time.

3.4.2 Regression Analysis

To check whether the determinants of well-being changed during the economic crisis, I adopt a simple regression analysis. First, I estimate a standard happiness equation where the index of well-being is regressed over income, financial dissatisfaction, the proxies of social capital and the set of control variables illustrated before. The model is as follows:

$$SWB_i = \alpha + \boldsymbol{\beta} \cdot \mathbf{Soc - Dem_i} + \gamma_1 \cdot Y_i + \gamma_2 \cdot Fin - dissat_i + \boldsymbol{\gamma_3} \cdot \mathbf{SC_i} + D_{country} + \mu \quad (34)$$

where $\mathbf{Soc - Dem_i}$ and $\mathbf{SC_i}$ are vectors of socio-demographic control variables, and of proxies of social capital. $D_{country}$ is a vector of dummy variables to account for country unobserved heterogeneity.

Second, I extend equation 34 to include interaction effects with the *year* variable. The interactions of the independent variables with year dummies allows to check whether coefficients change significantly from one year to the others. Formally, I estimate the following model:

$$\begin{aligned} SWB_i = \alpha + &\boldsymbol{\beta} \cdot \mathbf{Soc - Dem_i} + \gamma_1 \cdot Y_i \cdot year + \gamma_2 \cdot Fin - dissat_i \cdot year + \\ &\boldsymbol{\gamma_3} \cdot \mathbf{SC_i} \cdot year + D_{country} + \epsilon \end{aligned} \quad (35)$$

Equations 34 and 35 are estimated via OLS with robust standard errors.

3.5 Results

3.5.1 Decomposition of the Well-Being Gap for Western Countries

Between 2006 and 2010 people's well-being in Western European countries decreased by 0.36%, while it increased by 0.72% in the subsequent period. The average well-being between 2006 and 2010 sensibly increased. The decomposition in table 24 informs that changes in the levels of some selected explanatory variables explain the well-being differential in the two periods.

Figures 8 and 9 detail the contribution of the main explanatory variables to the composition of the well-being differential in the two periods.[60] The first remarkable aspect concerns the unexplained part of the gap: even though the unexplained part is not significant, one variable plays a significant role: income. Between 2006 and 2010 income becomes about two times more important for people's well-being (the coefficient changes from 0.069 in 2006 to 0.133 in 2010. Hence, a scarcer income accompanied by an increase of its importance predicts an increase in well-being. However, the increased importance is short lived: in the subsequent period

[60]For detailed results, refer to table B8 and B10 in appendix B.3.

Table 24: Decomposition of the well-being gap for Western European countries.

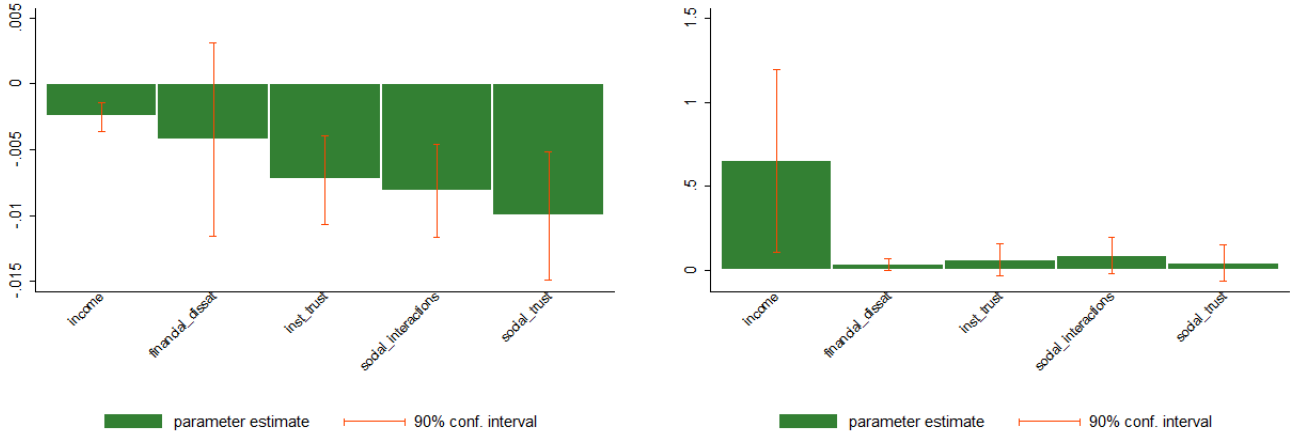
	2010-2006		2012-2010	
Differential				
Prediction_1	7.447***	(559.58)	7.519***	(630.65)
Prediction_2	7.483***	(622.38)	7.447***	(559.58)
Difference	-0.0364*	(-2.03)	0.0724***	(4.05)
Decomposition				
Explained	-0.0364*	(-2.03)	0.0724***	(4.05)
Unexplained	-9.49e-15	(-0.00)	-1.30e-13	(-0.00)
Observations	38339		39634	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

the importance attached to income for well-being shifts from 0.133 to 0.024 which, associated with a further decline in average income, predicts a negative impact on well-being. The first conclusion from the decomposition of well-being for Western countries is that the economic crisis is associated to a short lived increase in the importance that people attach to income.

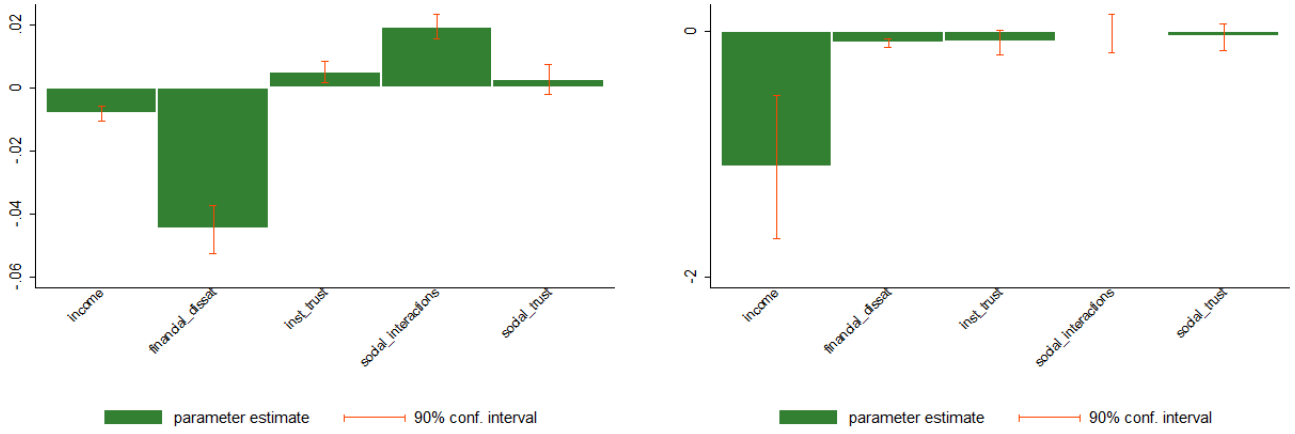
Figure 8: Explained and unexplained part of the well-being gap between 2006 and 2010 in Western European countries



Explained Unexplained

Besides the shift in preferences, people's well-being in Western Europe is shaped by changes in the levels of some important variables. Between 2006 and 2010 the average income decreased, predicting a negative impact on well-being. Also financial dissatisfaction increased, but the effect of well-being is not significant. Remarkably, all the proxies of social capital decreased as well: in the considered period people meeting others at least once a week decreased by 2.4%, the share of people trusting others and institutions decreased by 0.62% and 0.73% respectively, whereas the percentage of people declaring to have someone with whom to discuss intimate and personal things reduced marginally. Such changes predict a decline of well-being between 2006 and 2010 that is larger than the decline predicted by the lost income. For instance, the decrease in trust in others predicts a negative effect on well-being that is four times larger than the income decrease. The second conclusion from the decomposition of well-being for Western countries is that the loss of social capital has a larger impact on well-being than the loss of income. Such conclusion is reinforced by the evidence from the period 2010 - 2012.

Figure 9: Explained and unexplained part of the well-being gap between 2010 and 2012 in Western European countries



Explained Unexplained

The persistent loss of income and the worsening financial dissatisfaction predict a decrease in well-being (-0.52%) which is moderated by the increase in social capital (+0.2% trust in others, +0.5% confidence in institutions, and +5% people having someone to discuss intimate and personal issues).

3.5.2 Decomposition of the Well-Being Gap for Eastern Countries

Eastern countries show a sudden decrease of well-being between 2006 and 2008 as well as a fast recovery between 2008 and 2010. In the first period people's well-being decreases by 2.08%, but two years later the loss is almost entirely recovered (+1.73%). In 2012 the level of well-being for Eastern Europeans returned to the initial level of 2006.

Table 25: Decomposition of the well-being gap for Eastern European countries.

	2008-2006		2010-2008	
Differential				
Prediction_1	5.890***	(205.75)	6.063***	(286.46)
Prediction_2	6.098***	(212.13)	5.890***	(205.75)
Difference	-0.208***	(-5.13)	0.173***	(4.86)
Decomposition				
Explained	-0.208***	(-5.10)	0.173***	(4.88)
Unexplained	-1.74e-13	(-0.00)	1.20e-13	(0.00)
Observations	12637		17665	

t statistics in parentheses

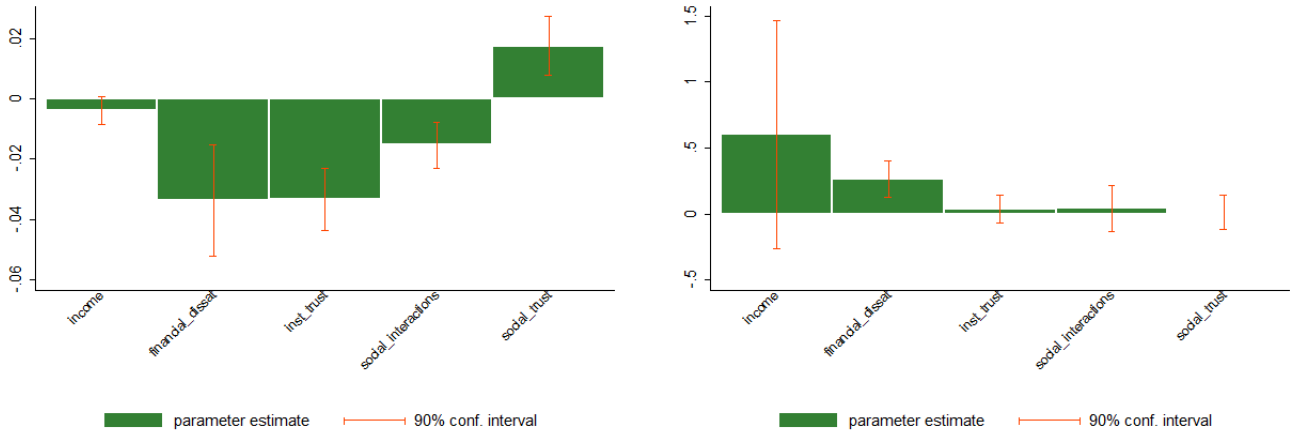
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Also in Eastern countries, just like in Western ones, well-being differentials are entirely explained by changes in the levels of the predictors of well-being (see table 25). Figures 10 and 11 detail the contribution of the main explanatory variables to the composition of the well-being differential in the two periods.[61] A similarity between Eastern and Western countries is the increase in the importance that people attach to income: between 2006 and 2008 the coefficient of income almost doubles (from 0.094 to 0.169). Such preference remains high in the period

[61] Detailed results are available in table B12 and B14 in appendix B.4.

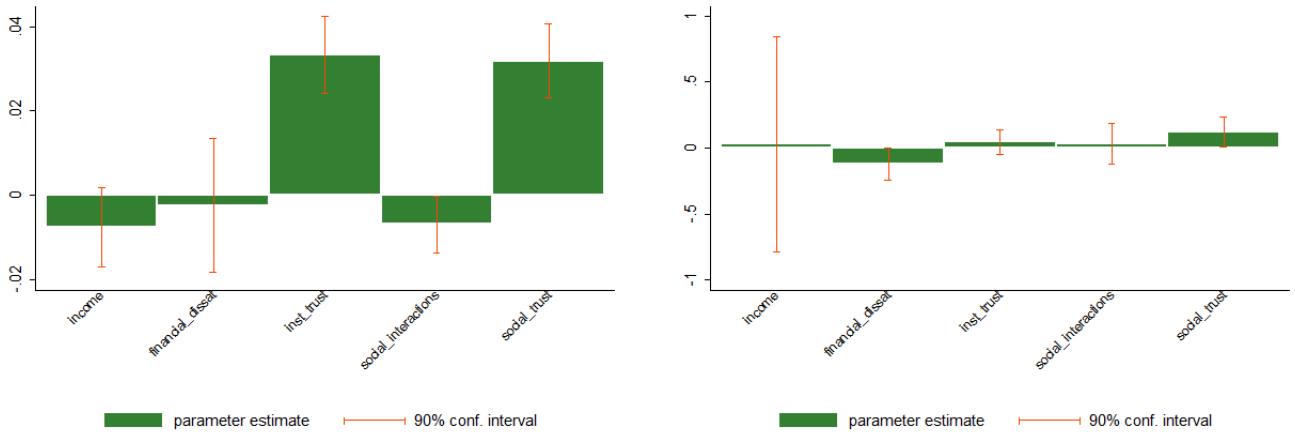
2008 - 2010: while in Western Europe preferences for income decreased, in Eastern Europe they remain persistently high.

Figure 10: Explained and unexplained part of the well-being gap between 2006 and 2008 in Eastern European countries



Explained Unexplained

Figure 11: Explained and unexplained part of the well-being gap between 2008 and 2010 in Eastern European countries



Explained Unexplained

Just as in Western countries, the well-being gap in Eastern countries is explained by the decrease in some important predictors of well-being, namely income, institutional trust, social interactions and by the increase in financial dissatisfaction. The recovery in well-being between 2008 and 2010 is driven by the increase in confidence in institutions and in trust in others.

Summarizing, the figures from the decomposition of the well-being gap in Western and Eastern Europe document the increase in the importance that people attach to income. Such increase is short lived in case of Western Europe and persistent in case of Eastern Europe. Furthermore, the decomposition documents that the loss of social capital in Western countries predicts a decrease of well-being that is larger than the decrease associated with the loss of income. Eastern countries experience something similar, with financial dissatisfaction playing a major role which is comparable to the one of institutional trust. The decrease in the well-being of Easterners is only in part moderated by the increased trust in others. Finally, the

recovery of well-being – typical of the period after the crisis – is largely driven by the increase of social capital.

3.5.3 The Happiness Regression

After comparing the predictive power of social capital and income for well-being in times of crisis, I test whether the components of the happiness regression changed over time, i.e. whether the importance that people attach to the various determinants of well-being changed after the crisis. This allows us to check whether, to what extent, and for how long economic crisis altered the components of people's well-being. To this aim I first present the results from a standard happiness regression (see equation 34), and than I extend it to include interaction effects with year dummies (see equation 35).

Table 26 reports the results of various happiness regressions: for comparability, I include regressions made by year, and by year and region to check whether the signs and significance of the coefficients differ over time, or over time and regions. In all cases signs and significance of coefficients are as expected. After controlling for regional fixed effects and the size of the place where the respondent live, the relationship between age and well-being is characterized by the U-shape usually identified in the literature; men report on average lower well-being than women; single, widowed, separated and divorced ones tend to report lower well-being than married people; unemployed people are less happy than people in employment. Unsurprisingly, one percent increase in household income results in higher well-being, whereas financial dissatisfaction is associated with lower well-being. In particular, the higher the dissatisfaction, the more negative is the effect on well-being. Finally, the four proxies of social capital show that the higher is social involvement, trust in others and in institutions, the more people tend to be satisfied with their lives.

How do these relationships change over time? The answer to this question is provided in the last column of table 27 and in the third and fifth column of table 28 for Western and Eastern countries separately. The full model of table 27 reports the interaction of year dummies with all the independent variables. It documents that the importance that people attach to the various ingredients of well-being significantly changed over time for only a sub-set of variables, namely for age, marital status, religion, unemployment, and for the four proxies of social capital. The only variables whose importance changed over time are income and financial dissatisfaction. Compared to the baseline level (income in 2006) the coefficient of income became increasingly negative over time. For what concerns financial dissatisfaction, the coefficient in 2012 is significantly more negative than the one in 2006.

Table 26: Correlates of subjective well-being in 22 European countries before and after the crisis.

	2006	2006-W	2006-E	2008	2008-W	2008-E	2010	2010-W	2010-E	2012	2012-W	2012-E
Age of respondent, calculated	-0.0451***	-0.0334***	-0.0674***	-0.0519***	-0.0390***	-0.0766***	-0.0524***	-0.0368***	-0.0716***	-0.0462***	-0.0315***	-0.0657***
	(-11.31)	(-7.76)	(-6.78)	(-12.91)	(-8.93)	(-8.26)	(-13.16)	(-7.79)	(-10.04)	(-12.50)	(-7.35)	(-9.60)
age squared / 100	0.0386***	0.0282***	0.0558***	0.0451***	0.0353***	0.0605***	0.0478***	0.0363***	0.0592***	0.0409***	0.0302***	0.0528***
	(9.34)	(6.31)	(5.41)	(10.93)	(7.80)	(6.51)	(11.91)	(7.65)	(8.27)	(10.99)	(6.98)	(7.70)
male	-0.0793***	-0.0932***	-0.0199	-0.0841***	-0.0807***	-0.0974	-0.0594**	-0.0411	-0.102**	-0.102***	-0.0599**	-0.173***
	(-4.00)	(-4.43)	(-0.40)	(-4.10)	(-3.72)	(-1.89)	(-3.00)	(-1.78)	(-2.85)	(-5.63)	(-2.94)	(-4.89)
separated	-0.795***	-0.755***	-0.991***	-0.466***	-0.436***	-0.598**	-0.797***	-0.746***	-1.255***	-0.458***	-0.448***	-1.150
	(-8.02)	(-6.81)	(-4.47)	(-4.94)	(-4.16)	(-2.86)	(-7.05)	(-6.29)	(-3.50)	(-3.51)	(-3.38)	(-1.48)
divorced	-0.316***	-0.291***	-0.493***	-0.381***	-0.359***	-0.528***	-0.398***	-0.367***	-0.482***	-0.329***	-0.394***	-0.252***
	(-8.23)	(-7.19)	(-4.82)	(-9.96)	(-8.76)	(-5.73)	(-11.01)	(-8.37)	(-7.89)	(-9.92)	(-10.01)	(-4.25)
widowed	-0.541***	-0.485***	-0.568***	-0.554***	-0.601***	-0.360***	-0.492***	-0.459***	-0.433***	-0.587***	-0.627***	-0.463***
	(-11.86)	(-9.30)	(-6.21)	(-12.04)	(-11.19)	(-4.08)	(-11.36)	(-8.10)	(-6.57)	(-15.05)	(-12.45)	(-7.51)
never married	-0.424***	-0.375***	-0.566***	-0.396***	-0.358***	-0.489***	-0.358***	-0.326***	-0.364***	-0.372***	-0.313***	-0.463***
	(-14.06)	(-11.95)	(-6.30)	(-12.71)	(-11.07)	(-5.43)	(-11.69)	(-9.10)	(-6.43)	(-13.33)	(-9.95)	(-8.31)
children living at home	-0.0196	0.00853	-0.0710	-0.00561	0.0515	-0.0909	0.0330	-0.00215	0.0990*	0.0175	-0.0292	0.100*
	(-0.66)	(0.26)	(-1.01)	(-0.18)	(1.51)	(-1.33)	(1.13)	(-0.06)	(2.01)	(0.64)	(-0.90)	(2.07)
in education	0.0588	0.0477	0.0474	-0.0232	-0.0112	-0.0412	0.0334	0.0509	0.00521	0.102*	0.0463	0.327***
	(1.28)	(0.95)	(0.45)	(-0.47)	(-0.21)	(-0.36)	(0.69)	(0.90)	(0.06)	(2.33)	(0.95)	(3.69)
unemployed	-0.397***	-0.446***	-0.324**	-0.441***	-0.431***	-0.519***	-0.252***	-0.432***	-0.0383	-0.365***	-0.426***	-0.263***
	(-6.95)	(-6.93)	(-2.73)	(-7.23)	(-6.27)	(-4.13)	(-5.22)	(-7.26)	(-0.48)	(-8.38)	(-8.23)	(-3.29)
sick or disabled	-0.729***	-0.845***	-0.358	-0.559***	-0.578***	-0.595**	-0.473***	-0.502***	-0.606***	-0.558***	-0.716***	-0.203
	(-8.72)	(-9.27)	(-1.76)	(-6.91)	(-6.57)	(-2.90)	(-6.40)	(-6.11)	(-3.56)	(-7.91)	(-8.91)	(-1.40)
retired	0.140***	0.186***	0.171	0.0319	0.0923*	-0.0379	-0.0225	0.0779	-0.0396	-0.0126	0.0517	-0.0185
	(3.64)	(4.45)	(1.93)	(0.80)	(2.13)	(-0.43)	(-0.61)	(1.72)	(-0.64)	(-0.37)	(1.32)	(-0.30)
civil/military service	0.0785	0.322	-0.429	0.179	0.361	-0.0209	-0.199	-0.428	0.253	-0.508	-0.245	-1.209
	(0.30)	(1.29)	(-0.69)	(0.52)	(1.11)	(-0.02)	(-0.63)	(-1.40)	(0.44)	(-1.80)	(-0.97)	(-1.33)
housework	0.0324	0.0369	-0.000605	0.0611	-0.00248	0.165	0.0624	0.0397	0.00988	-0.0230	0.00741	-0.0942
	(0.85)	(0.92)	(-0.01)	(1.46)	(-0.05)	(1.82)	(1.52)	(0.83)	(0.13)	(-0.63)	(0.18)	(-1.39)
other	-0.00618	-0.00198	0.0949	-0.137	-0.0792	-0.373	-0.0985	-0.0919	0.00584	-0.0176	0.0296	-0.145
	(-0.06)	(-0.02)	(0.30)	(-1.29)	(-0.70)	(-1.26)	(-0.86)	(-0.73)	(0.02)	(-0.19)	(0.31)	(-0.61)
Years of full-time education completed	-0.00169	-0.00887**	0.0453***	-0.00293	-0.00679*	0.0199**	-0.0000804	-0.00735*	0.0253***	-0.00752**	-0.0164***	0.0300***
	(-0.63)	(-3.19)	(5.52)	(-1.03)	(-2.24)	(2.60)	(-0.03)	(-2.30)	(4.20)	(-3.00)	(-6.02)	(5.21)
Number of people living regularly as member of household	0.0199	0.0269*	0.00989	0.0224	0.0175	0.0261	0.0239*	0.0596***	-0.0218	0.00983	0.0486***	-0.0447*
	(1.77)	(2.15)	(0.43)	(1.81)	(1.28)	(1.04)	(2.06)	(4.09)	(-1.17)	(0.91)	(3.84)	(-2.32)
ln of household income	0.0873***	0.0733***	0.104*	0.104***	0.0681*	0.169***	0.165***	0.139***	0.176***	0.0887***	0.0262	0.155***
	(5.26)	(4.08)	(2.54)	(4.42)	(2.56)	(3.50)	(7.47)	(5.13)	(4.66)	(4.62)	(1.18)	(4.13)
insatfin==1	-0.366***	-0.376***	-0.469***	-0.393***	-0.422***	-0.281***	-0.343***	-0.352***	-0.434***	-0.410***	-0.427***	-0.434***
	(-16.94)	(-16.75)	(-6.18)	(-16.96)	(-17.59)	(-3.36)	(-14.72)	(-13.66)	(-7.53)	(-19.72)	(-19.43)	(-7.18)
insatfin==2	-1.065***	-1.008***	-1.241***	-1.112***	-1.144***	-0.925***	-0.950***	-0.916***	-1.032***	-1.100***	-1.088***	-1.095***
	(-29.24)	(-24.32)	(-13.28)	(-28.23)	(-24.93)	(-9.32)	(-26.71)	(-20.01)	(-15.14)	(-34.43)	(-27.99)	(-15.67)
insatfin==3	-1.904***	-1.741***	-2.066***	-1.808***	-1.874***	-1.519***	-1.739***	-1.532***	-1.845***	-1.986***	-1.915***	-1.948***
	(-30.55)	(-20.48)	(-17.61)	(-27.71)	(-20.16)	(-12.31)	(-31.84)	(-17.70)	(-21.33)	(-40.50)	(-25.56)	(-23.02)
index of social trust	0.161***	0.160***	0.152***	0.162***	0.164***	0.154***	0.178***	0.168***	0.183***	0.158***	0.158***	0.155***
	(23.56)	(20.52)	(11.31)	(23.15)	(20.23)	(11.82)	(26.80)	(19.10)	(18.64)	(25.73)	(20.52)	(16.10)
index of confidence	0.109***	0.101***	0.141***	0.110***	0.0919***	0.151***	0.134***	0.113***	0.164***	0.119***	0.0975***	0.152***
	(17.98)	(14.73)	(11.60)	(17.12)	(12.66)	(11.92)	(23.02)	(14.89)	(18.55)	(21.57)	(14.18)	(17.34)
having someone to discuss intimate things	0.467***	0.483***	0.439***	0.523***	0.531***	0.510***	0.526***	0.510***	0.538***	0.419***	0.525***	0.319***
	(11.39)	(10.34)	(5.30)	(12.65)	(11.39)	(6.09)	(14.11)	(10.35)	(9.68)	(7.77)	(6.14)	(4.61)
social gathering	0.306***	0.269***	0.398***	0.310***	0.282***	0.352***	0.380***	0.366***	0.372***	0.324***	0.294***	0.376***
	(14.11)	(11.45)	(7.99)	(14.06)	(11.84)	(7.02)	(18.02)	(14.39)	(10.37)	(17.06)	(13.49)	(10.58)
attending religious services	0.0477***	0.0443***	0.0621***	0.0442***	0.0400***	0.0560**	0.0505***	0.0315***	0.0763***	0.0574***	0.0418***	0.0792***
	(6.51)	(5.68)	(3.41)	(5.71)	(4.86)	(2.91)	(6.89)	(3.72)	(5.69)	(8.48)	(5.36)	(6.18)
a big city	-0.0677*	-0.133***	0.0513	-0.0821**	-0.0531	-0.123	-0.0164	-0.0627	0.0291	-0.0883***	-0.130***	-0.0580
	(-2.32)	(-4.18)	(0.76)	(-2.77)	(-1.63)	(-1.87)	(-0.59)	(-1.84)	(0.63)	(-3.49)	(-4.30)	(-1.29)
suburbs of big city	-0.0296	-0.0502	0.0578	-0.0923**	-0.0843*	-0.0848	-0.0365	-0.125***	0.216**	-0.0924**	-0.167***	0.201**
	(-1.02)	(-1.67)	(0.61)	(-2.83)	(-2.51)	(-0.75)	(-1.15)	(-3.67)	(2.82)	(-3.23)	(-5.47)	(2.64)
town or small city	-0.0571*	-0.0760**	-0.0158	-0.0332	-0.0362	-0.0152	-0.0689**	-0.118***	-0.00360	-0.0859***	-0.128***	-0.0212
	(-2.42)	(-3.04)	(-0.26)	(-1.39)	(-1.43)	(-0.26)	(-2.94)	(-4.29)	(-0.08)	(-3.96)	(-5.27)	(-0.50)
Constant	6.279***	6.246***	5.811***	6.211***	6.358***	4.900***	5.348***	5.382***	5.657***	6.501***	6.789***	6.226***
	(30.52)	(28.18)	(12.03)	(23.78)	(21.85)	(10.39)	(21.39)	(17.84)	(22.21)	(28.86)	(25.61)	(24.12)
Observations	26766	20593	6173	25869	19405	6464	28947	17746	11201	33668	21888	11780
Adjusted R^2	0.388	0.318	0.361	0.405	0.321	0.353	0.410	0.322	0.374	0.411	0.328	0.360

Table 27: Changes in the correlates of people's well-being over time using OLS with interaction terms.

	individual aspects		social aspects		full model	
Age of respondent, calculated	-0.0682***	(-31.67)	-0.0561***	(-27.58)	-0.0489***	(-24.97)
age squared / 100	0.0655***	(29.80)	0.0523***	(25.25)	0.0430***	(21.53)
male	-0.0986***	(-9.24)	-0.0410***	(-4.04)	-0.0815***	(-8.34)
separated	-1.058***	(-9.57)	-0.963***	(-9.28)		
divorced	-0.628***	(-15.01)	-0.499***	(-12.66)		
widowed	-0.725***	(-15.96)	-0.692***	(-16.11)		
never married	-0.558***	(-19.98)	-0.517***	(-19.36)		
year==4	-0.0753**	(-2.93)	-0.0891	(-1.06)	-0.414	(-1.94)
year==5	0.0402	(1.56)	-0.118	(-1.47)	0.461**	(2.68)
year==6	0.129***	(5.23)	0.0878	(0.99)	1.026***	(5.89)
1.children living at home	-0.187***	(-7.33)	-0.140***	(-5.76)	-0.0300	(-1.28)
1o.hhchild*3b.year	0	(.)	0	(.)	0	(.)
1.hhchild*4.year	0.0429	(1.32)	0.0186	(0.60)	0.0298	(0.99)
1.hhchild*5.year	0.0924**	(2.89)	0.0767*	(2.53)	0.102***	(3.48)
1.hhchild*6.year	0.00998	(0.32)	0.0132	(0.45)	0.0481	(1.70)
1o.separated	0	(.)	0	(.)	-0.762***	(-7.73)
1o.ms2*3b.year	0	(.)	0	(.)	0	(.)
1.ms2*4.year	0.346*	(2.32)	0.286*	(2.01)	0.304*	(2.23)
1.ms2*5.year	-0.239	(-1.45)	-0.152	(-0.97)	-0.144	(-0.96)
1.ms2*6.year	0.261	(1.48)	0.271	(1.63)	0.311	(1.92)
1o.divorced	0	(.)	0	(.)	-0.314***	(-8.29)
1o.ms3*3b.year	0	(.)	0	(.)	0	(.)
1.ms3*4.year	-0.0286	(-0.49)	-0.0556	(-1.02)	-0.0597	(-1.14)
1.ms3*5.year	-0.0811	(-1.42)	-0.0902	(-1.68)	-0.123*	(-2.40)
1.ms3*6.year	0.0440	(0.80)	-0.000412	(-0.01)	-0.0156	(-0.32)
1o.widowed	0	(.)	0	(.)	-0.527***	(-12.53)
1o.ms4*3b.year	0	(.)	0	(.)	0	(.)
1.ms4*4.year	-0.0282	(-0.46)	-0.0438	(-0.75)	-0.0265	(-0.46)
1.ms4*5.year	0.00966	(0.16)	0.0252	(0.44)	-0.0398	(-0.71)
1.ms4*6.year	-0.0277	(-0.48)	-0.0603	(-1.10)	-0.0901	(-1.67)
1o.never married	0	(.)	0	(.)	-0.422***	(-16.38)
1o.ms5*3b.year	0	(.)	0	(.)	0	(.)
1.ms5*4.year	0.0464	(1.26)	0.0253	(0.71)	0.0463	(1.35)
1.ms5*5.year	0.0574	(1.58)	0.0601	(1.73)	0.0443	(1.32)
1.ms5*6.year	0.0233	(0.68)	0.0239	(0.72)	0.0376	(1.17)
in education	0.0329	(1.31)	-0.0790***	(-3.33)	0.0239	(1.02)
1.unemployed	-1.040***	(-16.69)	-0.888***	(-15.08)	-0.452***	(-8.04)
1o.totunemp*3b.year	0	(.)	0	(.)	0	(.)
1.totunemp*4.year	-0.0733	(-0.81)	-0.0570	(-0.67)	-0.0141	(-0.17)
1.totunemp*5.year	0.0789	(0.99)	0.101	(1.35)	0.0946	(1.31)
1.totunemp*6.year	-0.0142	(-0.19)	-0.0273	(-0.38)	0.0301	(0.43)
sick or disabled	-1.217***	(-28.82)	-0.991***	(-25.06)	-0.603***	(-15.72)
retired	-0.199***	(-9.73)	-0.139***	(-7.23)	0.0250	(1.34)
civil/military service	-0.176	(-1.07)	-0.320*	(-2.08)	-0.138	(-0.91)
housework	-0.168***	(-7.80)	-0.133***	(-6.52)	0.0103	(0.53)
other	-0.307***	(-5.27)	-0.260***	(-4.72)	-0.0831	(-1.62)
Years of full-time education completed	0.0416***	(28.60)	0.0186***	(13.46)	-0.00368**	(-2.73)
Number of people living regularly as member of household	0.0795***	(13.19)	0.0577***	(10.02)	0.0232***	(4.08)
a big city	-0.0614***	(-4.01)	-0.0499***	(-3.45)	-0.0513***	(-3.68)
suburbs of big city	-0.0742***	(-4.44)	-0.0395*	(-2.51)	-0.0607***	(-3.99)
town or small city	-0.0882***	(-6.93)	-0.0578***	(-4.80)	-0.0561***	(-4.84)
index of social trust			0.194***	(28.41)	0.167***	(25.13)
3b.year*co.factor2			0	(.)	0	(.)
4.year*c.factor2			-0.00343	(-0.36)	-0.00525	(-0.56)
5.year*c.factor2			-0.00157	(-0.17)	0.00777	(0.85)
6.year*c.factor2			-0.00559	(-0.62)	-0.00966	(-1.09)
index of confidence			0.136***	(22.89)	0.110***	(18.90)
3b.year*co.factor3			0	(.)	0	(.)
4.year*c.factor3			0.00789	(0.95)	0.00526	(0.63)
5.year*c.factor3			0.00957	(1.20)	0.0188*	(2.33)
6.year*c.factor3			-0.000492	(-0.06)	0.00712	(0.93)
1.having someone to discuss intimate things			0.534***	(12.48)	0.467***	(11.39)
1o.Dfs_inmdisc*3b.year			0	(.)	0	(.)
1.Dfs_inmdisc*4.year			0.0521	(0.87)	0.0545	(0.94)
1.Dfs_inmdisc*5.year			0.0964	(1.68)	0.0860	(1.56)
1.Dfs_inmdisc*6.year			0.0273	(0.39)	-0.00621	(-0.09)
1.social gathering			0.344***	(15.55)	0.302***	(14.19)
1o.Dfs_sclmeet*3b.year			0	(.)	0	(.)
1.Dfs_sclmeet*4.year			0.0125	(0.40)	0.0141	(0.47)
1.Dfs_sclmeet*5.year			0.0704*	(2.30)	0.0726*	(2.46)
1.Dfs_sclmeet*6.year			0.0305	(1.04)	0.0288	(1.03)
attending religious services			0.0503***	(7.13)	0.0526***	(7.66)
3b.year*co.fs_relig			0	(.)	0	(.)
4.year*c.fs_relig			-0.0120	(-1.19)	-0.00464	(-0.47)
5.year*c.fs_relig			-0.00418	(-0.43)	-0.00942	(-0.99)
6.year*c.fs_relig			0.00744	(0.79)	0.00812	(0.88)
ln of household income					0.101***	(7.48)
3b.year*co.ln_hhy					0	(.)
4.year*c.ln_hhy					0.0318	(1.58)
5.year*c.ln_hhy					-0.0688***	(-4.40)
6.year*c.ln_hhy					-0.0864***	(-5.57)
financial dissatisfaction					-0.592***	(-38.09)
3b.year*co.insatfin					0	(.)
4.year*c.insatfin					0.0161	(0.70)
5.year*c.insatfin					0.0128	(0.60)
6.year*c.insatfin					-0.0703***	(-3.44)
Constant	8.891***	(136.11)	6.355***	(75.63)	6.330***	(40.53)
Observations	115250		115250		115250	
Adjusted R^2	0.273		0.352		0.401	

Note: country fixed effects are included in the model, but omitted for brevity.

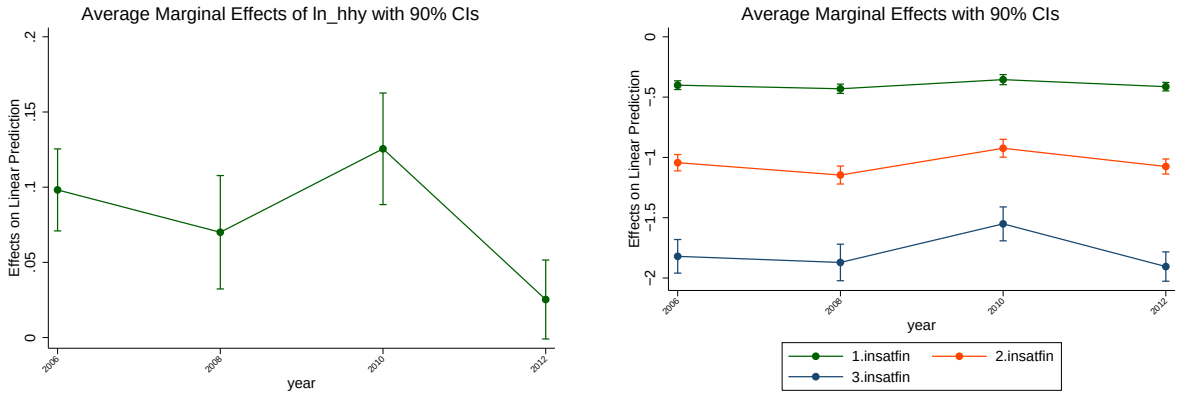
Table 28: Changes in the correlates of people's well-being over time by groups of countries. OLS with interaction terms.

	all sample		Western countries		Eastern countries	
Age of respondent, calculated	-0.0489***	(-24.97)	-0.0353***	(-16.00)	-0.0690***	(-17.29)
age squared / 100	0.0430***	(21.52)	0.0325***	(14.40)	0.0556***	(13.84)
year==4	-0.408	(-1.91)	0.249	(0.85)	-2.026***	(-4.05)
year==5	0.448**	(2.59)	-0.422	(-1.45)	-0.421	(-1.13)
year==6	1.037***	(5.93)	0.885***	(3.53)	0.294	(0.78)
1.male	-0.0782***	(-4.04)	-0.0909***	(-4.42)	-0.0324	(-0.67)
1o.fs_gndr*3b.year	0	(.)	0	(.)	0	(.)
1.fs_gndr*4.year	-0.0123	(-0.44)	0.00939	(0.32)	-0.0796	(-1.15)
1.fs_gndr*5.year	0.0177	(0.65)	0.0496	(1.64)	-0.0728	(-1.22)
1.fs_gndr*6.year	-0.0172	(-0.66)	0.0311	(1.09)	-0.126*	(-2.13)
1.children living at home	-0.0298	(-1.27)	0.0214	(0.83)	-0.0982	(-1.69)
1o.hhchild*3b.year	0	(.)	0	(.)	0	(.)
1.hhchild*4.year	0.0288	(0.96)	0.00847	(0.26)	0.0926	(1.21)
1.hhchild*5.year	0.104***	(3.52)	-0.00483	(-0.14)	0.208**	(3.14)
1.hhchild*6.year	0.0465	(1.64)	-0.0442	(-1.41)	0.169**	(2.58)
1.separated	-0.762***	(-7.72)	-0.701***	(-6.38)	-1.015***	(-4.58)
1o.ms2*3b.year	0	(.)	0	(.)	0	(.)
1.ms2*4.year	0.303*	(2.22)	0.285	(1.88)	0.402	(1.33)
1.ms2*5.year	-0.142	(-0.95)	-0.120	(-0.74)	-0.317	(-0.75)
1.ms2*6.year	0.310	(1.91)	0.224	(1.31)	-0.104	(-0.13)
1.divorced	-0.313***	(-8.27)	-0.278***	(-6.95)	-0.530***	(-5.25)
1o.ms3*3b.year	0	(.)	0	(.)	0	(.)
1.ms3*4.year	-0.0612	(-1.16)	-0.0549	(-0.98)	-0.0501	(-0.37)
1.ms3*5.year	-0.121*	(-2.35)	-0.107	(-1.83)	0.0167	(0.14)
1.ms3*6.year	-0.0178	(-0.36)	-0.124*	(-2.24)	0.272*	(2.36)
1.widowed	-0.526***	(-12.43)	-0.492***	(-10.12)	-0.547***	(-6.60)
1o.ms4*3b.year	0	(.)	0	(.)	0	(.)
1.ms4*4.year	-0.0302	(-0.52)	-0.102	(-1.49)	0.111	(0.98)
1.ms4*5.year	-0.0351	(-0.62)	0.0284	(0.40)	0.0732	(0.73)
1.ms4*6.year	-0.0952	(-1.75)	-0.128	(-1.93)	0.0378	(0.39)
1.never married	-0.422***	(-16.39)	-0.318***	(-11.70)	-0.666***	(-9.21)
1o.ms5*3b.year	0	(.)	0	(.)	0	(.)
1.ms5*4.year	0.0462	(1.34)	-0.00365	(-0.10)	0.244*	(2.53)
1.ms5*5.year	0.0446	(1.33)	-0.0471	(-1.27)	0.261**	(3.19)
1.ms5*6.year	0.0373	(1.16)	-0.0306	(-0.89)	0.207*	(2.54)
in education	0.0239	(1.02)	0.0191	(0.74)	0.0809	(1.65)
1.unemployed	-0.452***	(-8.04)	-0.486***	(-7.65)	-0.416***	(-3.59)
1o.totunemp*3b.year	0	(.)	0	(.)	0	(.)
1.totunemp*4.year	-0.0137	(-0.17)	0.00855	(0.09)	-0.0673	(-0.40)
1.totunemp*5.year	0.0925	(1.28)	-0.0264	(-0.31)	0.333*	(2.42)
1.totunemp*6.year	0.0311	(0.44)	0.0106	(0.13)	0.0689	(0.50)
sick or disabled	-0.603***	(-15.71)	-0.677***	(-15.87)	-0.450***	(-5.14)
retired	0.0250	(1.34)	0.105***	(4.96)	-0.000717	(-0.02)
civil/military service	-0.138	(-0.91)	0.00982	(0.07)	-0.294	(-0.76)
housework	0.0103	(0.53)	0.0183	(0.84)	-0.0382	(-0.95)
other	-0.0834	(-1.63)	-0.0411	(-0.76)	-0.166	(-1.20)
Years of full-time education completed	-0.00367**	(-2.73)	-0.0114***	(-7.85)	0.0313***	(9.42)
Number of people living regularly as member of household	0.0233***	(4.09)	0.0394***	(5.93)	-0.00362	(-0.35)
ln of household income	0.101***	(7.47)	0.0918***	(5.55)	0.0299	(0.86)
3b.year*co.ln_hhy	0	(.)	0	(.)	0	(.)
4.year*c.ln_hhy	0.0321	(1.60)	-0.0249	(-0.92)	0.175***	(3.48)
5.year*c.ln_hhy	-0.0688***	(-4.40)	0.0291	(1.09)	0.00619	(0.17)
6.year*c.ln_hhy	-0.0861***	(-5.55)	-0.0681**	(-3.09)	-0.0218	(-0.60)
financial dissatisfaction	-0.592***	(-38.07)	-0.536***	(-31.26)	-0.723***	(-20.24)
3b.year*co.insatfin	0	(.)	0	(.)	0	(.)
4.year*c.insatfin	0.0158	(0.69)	-0.0338	(-1.33)	0.171***	(3.33)
5.year*c.insatfin	0.0134	(0.63)	0.0617*	(2.41)	0.0489	(1.15)
6.year*c.insatfin	-0.0708***	(-3.47)	-0.0376	(-1.58)	-0.0304	(-0.72)
index of social trust	0.167***	(25.10)	0.165***	(21.87)	0.154***	(11.47)
3b.year*co.factor2	0	(.)	0	(.)	0	(.)
4.year*c.factor2	-0.00540	(-0.57)	0.00311	(0.29)	-0.00563	(-0.30)
5.year*c.factor2	0.00791	(0.87)	0.000884	(0.08)	0.0293	(1.77)
6.year*c.factor2	-0.00986	(-1.11)	-0.00830	(-0.79)	0.00344	(0.21)
index of confidence	0.110***	(18.88)	0.101***	(15.18)	0.132***	(10.92)
3b.year*co.factor3	0	(.)	0	(.)	0	(.)
4.year*c.factor3	0.00528	(0.63)	-0.00638	(-0.67)	0.0318	(1.83)
5.year*c.factor3	0.0187*	(2.32)	0.0113	(1.14)	0.0288	(1.94)
6.year*c.factor3	0.00717	(0.93)	-0.00209	(-0.23)	0.0159	(1.07)
1.having someone to discuss intimate things	0.467***	(11.40)	0.483***	(10.38)	0.452***	(5.50)
1o.Dfs_inmdisc*3b.year	0	(.)	0	(.)	0	(.)
1.Dfs_inmdisc*4.year	0.0531	(0.92)	0.0529	(0.81)	0.0566	(0.48)
1.Dfs_inmdisc*5.year	0.0879	(1.60)	0.0358	(0.53)	0.0979	(0.99)
1.Dfs_inmdisc*6.year	-0.00761	(-0.11)	0.0692	(0.71)	-0.119	(-1.11)
1.social gathering	0.302***	(14.19)	0.268***	(11.56)	0.375***	(7.67)
1o.Dfs_sclmeet*3b.year	0	(.)	0	(.)	0	(.)
1.Dfs_sclmeet*4.year	0.0140	(0.47)	0.0238	(0.72)	-0.0156	(-0.23)
1.Dfs_sclmeet*5.year	0.0726*	(2.45)	0.104**	(3.06)	-0.00593	(-0.10)
1.Dfs_sclmeet*6.year	0.0286	(1.02)	0.0216	(0.69)	0.0142	(0.24)
attending religious services	0.0528***	(7.66)	0.0553***	(7.34)	0.0553***	(3.46)
3b.year*co.fs_relig	0	(.)	0	(.)	0	(.)
4.year*c.fs_relig	-0.00505	(-0.51)	-0.0166	(-1.52)	0.0154	(0.69)
5.year*c.fs_relig	-0.00879	(-0.92)	-0.0304**	(-2.80)	0.0106	(0.54)
6.year*c.fs_relig	0.00757	(0.82)	-0.0142	(-1.37)	0.0363	(1.87)
a big city	-0.0512***	(-3.68)	-0.0962***	(-5.99)	-0.00136	(-0.05)
suburbs of big city	-0.0606***	(-3.99)	-0.111***	(-6.95)	0.137**	(3.16)
town or small city	-0.0560***	(-4.84)	-0.0881***	(-6.91)	-0.00121	(-0.05)
Constant	6.329***	(40.46)	6.085***	(31.84)	6.572***	(18.12)
Observations	115250		79632		35618	
Adjusted R^2	0.401		0.318		0.360	

Note: country fixed effects are included in the model, but omitted for brevity.

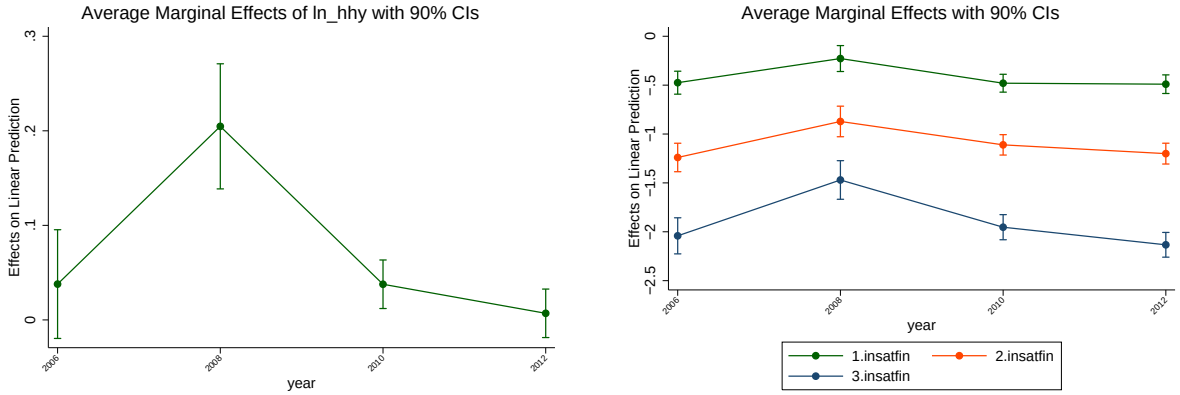
Figure 12 and 13 illustrate the marginal effects for income and financial dissatisfaction for Western and Eastern countries, respectively.[62]

Figures confirm that the importance of income in Western countries decreased over time: the coefficient in 2012 is positive, but significantly lower than the one in 2006. However, before losing about 50% of its magnitude, the coefficient of income first increased in 2010 when the average well-being reached its negative peak. For what concerns the coefficients of financial dissatisfaction, no remarkable differences happen over time in Western countries.



(a) Income (b) Financial dissatisfaction

Figure 12: Average marginal effects of income on well-being over time in Western countries.



(a) Income (b) Financial dissatisfaction

Figure 13: Average marginal effects of income on well-being over time in Eastern countries.

In Eastern countries the importance of income reaches its peak in 2008 when the average well-being is at its negative peak. Between 2006 and 2008 the importance that people attach to income more than doubles. However, such increase is short lived: by 2010 the coefficient reaches its pre-crisis level and it further decreases until 2012. The coefficients of financial dissatisfaction follow a similar pattern: they become slightly less negative in 2008 compared to 2006 and they go back to their pre-crisis levels in the two following years.

Summarizing, estimates suggest that the majority of independent variables did not significantly change their coefficients between 2006 and 2012. Hence, even though in times of crisis material concerns prevail, the importance that people attach to the various determinants of

[62]Marginal effects are computed after the results reported in table 28.

well-being did not change significantly. Income becomes temporarily more important: in Western countries this shift is slower, but more durable (4 years); in Eastern countries the shift is sudden and lasts only two years. In both cases, four years after the crisis people attach less importance to income than previously. The coefficient for financial dissatisfaction did not change much for Western countries, while it became temporarily less negative in Eastern countries.

3.6 Conclusions

This work argues that social capital matters for well-being also in times of economic crisis. In such unfortunate events material concerns gain relevance, but this is not enough to explain the loss of people's well-being. The decrease of social capital plays a large role in explaining the decreasing well-being of people in Western and Eastern countries. Hence, policies for the recovery from an economic crisis should mind their effects on social capital if their aim is to protect and promote people's well-being.

The figures from the decomposition of the well-being gap in Western and Eastern Europe document the increase in the importance that people attach to income. Such increase is short lived in the case of Western Europe and persistent in case of Eastern Europe. Furthermore, the decomposition documents that in case of Western countries the loss of social capital predicts a decrease in well-being that is larger than the decrease associated with the loss of income. Eastern countries experience something similar with financial dissatisfaction playing a major role which is comparable to the one of institutional trust. The decrease in the well-being of Easterners is only partly counteracted by the increased trust in others, while the recovery of well-being typical of the second period after the crisis is largely driven by the increase of social capital.

The analysis of the change of the coefficients of the predictors of well-being confirms the findings from the Blinder-Oaxaca decomposition. In particular, I found that the importance of various measures of social capital did not change over time, while income became only temporarily more important. This evidence lends support to the conclusion that social capital matters for well-being also in times of crisis, probably because it offers an informal safety net to which to resort in case of need, it attenuates social stigma, and it provides psychological support when in difficulty. At the same time, present results suggest that policies to promote a fast recovery from the crisis should not undermine other dimensions of people's lives such as social capital. The pursuit of economic recovery without caring for its side effects on various aspects of people's social lives risks to miss to deliver the desired result of promoting people's well-being. This might happen for at least two reasons: a. such policies aim at a fast recovery of income growth which has declining effects on people's well-being; b. they penalize other aspects of people's lives that matter for well-being. These explanations received some support in recent works about economic growth, trends of well-being and the moderating factors between them (Bartolini and Sarracino, 2014; Mikucka and Sarracino, 2014; Oishi and Kesebir, 2015). Hence, policies for recovery should be more socially-aware promoting growth while preserving the social environment.

B.1 Appendix B.1: Factor Analysis to Build the Indexes

Table B1: Factor loading and unique variances.

	*Factor*1	*PSI*
2006		
Most people try to take advantage of you, or try to be fair	.8445302	.2867688
Most people can be trusted or you can't be too careful	.8366396	.3000342
Most of the time people helpful or mostly looking out for themselves	.800868	.3586104
2008		
Most people try to take advantage of you, or try to be fair	.8522328	.2736993
Most people can be trusted or you can't be too careful	.8472131	.28223
Most of the time people helpful or mostly looking out for themselves	.8131431	.3387982
2010		
Most people try to take advantage of you, or try to be fair	.8467537	.2830081
Most people can be trusted or you can't be too careful	.8426472	.2899457
Most of the time people helpful or mostly looking out for themselves	.8114059	.3416205
2012		
Most people try to take advantage of you, or try to be fair	.8511103	.2756113
Most people can be trusted or you can't be too careful	.8488576	.2794407
Most of the time people helpful or mostly looking out for themselves	.8124947	.3398524

Table B2: Factor loading and unique variances for the proxies of confidence in institutions

	*Factor*1	*PSI*
2006		
Trust in country's parliament	.8362231	.300731
Trust in the legal system	.902575	.1853583
Trust in the police	.8546238	.2696182
2008		
Trust in country's parliament	.846284	.2838034
Trust in the legal system	.9103097	.1713362
Trust in the police	.8578383	.2641134
2010		
Trust in country's parliament	.8465308	.2833857
Trust in the legal system	.9139161	.1647574
Trust in the police	.8541123	.2704922
2012		
Trust in country's parliament	.8548708	.2691959
Trust in the legal system	.9184988	.1563599
Trust in the police	.8592529	.2616845

Table B3: Factor loading and unique variances for the proxies of well-being.

	*Factor*1	*PSI*
2006		
How satisfied with life as a whole	.9227887	.1484609
How happy are you	.9227887	.1484609
2008		
How satisfied with life as a whole	.9276047	.1395496
How happy are you	.9276047	.1395496
2010		
How satisfied with life as a whole	.9284555	.1379703
How happy are you	.9284555	.1379703
2012		
How satisfied with life as a whole	.9266394	.1413394
How happy are you	.9266394	.1413394

B.2 Appendix B.2: Detailed OLS Regressions

Table B4: Correlates of subjective well-being in 22 European countries in 2006.

	(1)	(2)	(3)	(4)
Age of respondent, calculated	-0.0611***	-0.0625***	-0.0441***	-0.0451***
	(-6.50)	(-7.14)	(-7.99)	(-8.18)
age squared / 100	0.0574***	0.0591***	0.0382***	0.0386***
	(6.58)	(7.29)	(7.74)	(7.79)
male	-0.0982**	-0.119***	-0.0916**	-0.0793**
	(-3.70)	(-4.50)	(-3.60)	(-3.12)
separated	-1.097***	-1.002***	-0.805***	-0.795***
	(-10.73)	(-9.68)	(-9.35)	(-9.53)
divorced	-0.602***	-0.520***	-0.333***	-0.316***
	(-9.71)	(-9.58)	(-6.59)	(-5.98)
widowed	-0.738***	-0.666***	-0.540***	-0.541***
	(-11.21)	(-10.16)	(-11.03)	(-11.12)
never married	-0.545***	-0.467***	-0.435***	-0.424***
	(-16.93)	(-12.89)	(-13.17)	(-12.48)
children living at home	-0.172***	-0.112**	-0.0286	-0.0196
	(-5.09)	(-3.07)	(-0.92)	(-0.64)
in education	0.0762	0.172*	0.0633	0.0588
	(1.09)	(2.69)	(1.39)	(1.29)
unemployed	-1.003***	-0.784***	-0.405***	-0.397***
	(-9.46)	(-9.24)	(-6.63)	(-6.49)
sick or disabled	-1.338***	-1.185***	-0.735***	-0.729***
	(-13.77)	(-12.62)	(-9.46)	(-9.51)
retired	-0.0531	0.0531	0.142***	0.140***
	(-1.05)	(1.10)	(4.12)	(4.02)
civil/military service	0.0378	0.138	0.0755	0.0785
	(0.10)	(0.35)	(0.24)	(0.25)
housework	-0.127*	-0.0286	0.0425	0.0324
	(-2.30)	(-0.60)	(1.02)	(0.78)
other	-0.173	-0.0745	-0.00428	-0.00618
	(-1.45)	(-0.67)	(-0.05)	(-0.07)
Years of full-time education completed	0.0397***	0.0244**	-0.00262	-0.00169
	(4.82)	(3.77)	(-0.48)	(-0.32)
Number of people living regularly as member of household	0.0742***	0.0173	0.0287*	0.0199
	(5.47)	(1.16)	(2.45)	(1.75)
ln of household income		0.347***	0.0795*	0.0873*
		(6.85)	(2.45)	(2.70)
insatfin==1			-0.365***	-0.366***
			(-8.65)	(-8.66)
insatfin==2			-1.067***	-1.065***
			(-12.06)	(-12.13)
insatfin==3			-1.906***	-1.904***
			(-13.97)	(-14.07)
index of social trust			0.162***	0.161***
			(15.93)	(15.67)
index of confidence			0.112***	0.109***
			(11.79)	(11.69)
having someone to discuss intimate things			0.470***	0.467***
			(9.30)	(9.20)
social gathering			0.308***	0.306***
			(8.84)	(8.69)
attending religious services				0.0477***
				(4.05)
a big city				-0.0677
				(-1.37)
suburbs of big city				-0.0296
				(-0.61)
town or small city				-0.0571
				(-1.66)
Constant	8.729***	5.480***	6.367***	6.279***
	(37.47)	(10.92)	(16.27)	(15.68)
Observations	26766	26766	26766	26766
Adjusted R^2	0.264	0.277	0.387	0.388

Table B5: Correlates of subjective well-being in 22 European countries in 2008.

	(1)	(2)	(3)	(4)
Age of respondent, calculated	-0.0678***	-0.0692***	-0.0513***	-0.0519***
	(-7.50)	(-9.03)	(-8.62)	(-8.44)
age squared / 100	0.0645***	0.0654***	0.0449***	0.0451***
	(8.62)	(10.69)	(8.69)	(8.39)
male	-0.106**	-0.137***	-0.0954**	-0.0841**
	(-3.43)	(-4.29)	(-3.76)	(-3.17)
separated	-0.709***	-0.568***	-0.478**	-0.466**
	(-5.98)	(-4.60)	(-3.64)	(-3.51)
divorced	-0.652***	-0.523***	-0.398***	-0.381***
	(-11.63)	(-9.45)	(-7.75)	(-7.57)
widowed	-0.696***	-0.557***	-0.550***	-0.554***
	(-9.24)	(-7.47)	(-8.36)	(-8.43)
never married	-0.525***	-0.423***	-0.410***	-0.396***
	(-11.85)	(-8.86)	(-10.24)	(-9.67)
children living at home	-0.178***	-0.104**	-0.0169	-0.00561
	(-4.33)	(-3.01)	(-0.49)	(-0.17)
in education	-0.0336	0.0927	-0.0299	-0.0232
	(-0.46)	(1.38)	(-0.54)	(-0.42)
unemployed	-1.100***	-0.817***	-0.449***	-0.441***
	(-10.57)	(-9.29)	(-7.71)	(-7.56)
sick or disabled	-1.174***	-0.943***	-0.562***	-0.559***
	(-14.26)	(-12.08)	(-6.68)	(-6.61)
retired	-0.212**	-0.0621	0.0361	0.0319
	(-3.25)	(-1.06)	(0.77)	(0.68)
civil/military service	-0.0122	0.0879	0.183	0.179
	(-0.03)	(0.26)	(0.53)	(0.53)
housework	-0.113	0.0135	0.0677	0.0611
	(-2.06)	(0.23)	(1.41)	(1.27)
other	-0.453*	-0.327	-0.148	-0.137
	(-2.68)	(-1.96)	(-1.13)	(-1.04)
Years of full-time education completed	0.0407***	0.0230**	-0.00467	-0.00293
	(5.17)	(3.47)	(-0.84)	(-0.51)
Number of people living regularly as member of household	0.0933***	0.0197	0.0326	0.0224
	(4.84)	(1.32)	(2.02)	(1.40)
ln of household income		0.500***	0.0929*	0.104*
		(11.24)	(2.67)	(2.89)
insatfin==1			-0.393***	-0.393***
			(-6.78)	(-6.67)
insatfin==2			-1.117***	-1.112***
			(-9.59)	(-9.50)
insatfin==3			-1.817***	-1.808***
			(-12.81)	(-12.66)
index of social trust			0.163***	0.162***
			(18.02)	(18.36)
index of confidence			0.112***	0.110***
			(11.13)	(10.98)
having someone to discuss intimate things			0.523***	0.523***
			(11.55)	(11.52)
social gathering			0.313***	0.310***
			(9.73)	(9.69)
attending religious services				0.0442**
				(3.95)
a big city				-0.0821*
				(-2.49)
suburbs of big city				-0.0923*
				(-2.51)
town or small city				-0.0332
				(-0.83)
Constant	8.737***	4.100***	6.361***	6.211***
	(32.99)	(8.57)	(21.27)	(20.41)
Observations	25869	25869	25869	25869
Adjusted R^2	0.289	0.304	0.404	0.405

Table B6: Correlates of subjective well-being in 22 European countries in 2010.

	(1)	(2)	(3)	(4)
Age of respondent, calculated	-0.0721***	-0.0729***	-0.0518***	-0.0524***
	(-8.50)	(-9.97)	(-9.41)	(-9.41)
age squared / 100	0.0705***	0.0711***	0.0477***	0.0478***
	(9.42)	(10.84)	(9.23)	(9.26)
male	-0.0623*	-0.0961***	-0.0737**	-0.0594*
	(-2.69)	(-4.08)	(-3.05)	(-2.58)
separated	-1.200***	-0.993***	-0.808***	-0.797***
	(-16.16)	(-16.22)	(-14.23)	(-14.74)
divorced	-0.716***	-0.566***	-0.412***	-0.398***
	(-12.30)	(-10.01)	(-7.77)	(-7.58)
widowed	-0.696***	-0.515***	-0.487***	-0.492***
	(-7.34)	(-6.01)	(-8.31)	(-8.46)
never married	-0.509***	-0.394***	-0.369***	-0.358***
	(-11.18)	(-8.54)	(-10.29)	(-10.24)
children living at home	-0.127**	-0.0467	0.0259	0.0330
	(-2.92)	(-1.39)	(0.93)	(1.24)
in education	0.0567	0.210*	0.0341	0.0334
	(0.70)	(2.51)	(0.49)	(0.49)
unemployed	-0.927***	-0.589***	-0.256*	-0.252*
	(-7.64)	(-5.24)	(-2.59)	(-2.64)
sick or disabled	-1.086***	-0.816***	-0.479***	-0.473***
	(-12.32)	(-9.95)	(-7.38)	(-7.05)
retired	-0.256***	-0.0881	-0.0185	-0.0225
	(-4.41)	(-1.70)	(-0.39)	(-0.48)
civil/military service	0.0116	0.0378	-0.210	-0.199
	(0.03)	(0.08)	(-0.62)	(-0.59)
housework	-0.147*	0.0150	0.0703	0.0624
	(-2.78)	(0.29)	(1.40)	(1.23)
other	-0.339**	-0.168	-0.0898	-0.0985
	(-2.94)	(-1.47)	(-0.85)	(-0.93)
Years of full-time education completed	0.0479***	0.0252**	-0.000410	-0.0000804
	(4.87)	(3.50)	(-0.07)	(-0.01)
Number of people living regularly as member of household	0.0954**	0.00729	0.0315	0.0239
	(3.79)	(0.32)	(1.85)	(1.46)
ln of household income		0.590***	0.157**	0.165**
		(10.52)	(3.60)	(3.77)
insatfin==1			-0.343***	-0.343***
			(-6.89)	(-6.82)
insatfin==2			-0.955***	-0.950***
			(-8.13)	(-7.95)
insatfin==3			-1.750***	-1.739***
			(-10.52)	(-10.26)
index of social trust			0.179***	0.178***
			(13.59)	(13.66)
index of confidence			0.137***	0.134***
			(9.43)	(9.34)
having someone to discuss intimate things			0.527***	0.526***
			(9.97)	(9.91)
social gathering			0.386***	0.380***
			(6.19)	(6.12)
attending religious services				0.0505***
				(5.26)
a big city				-0.0164
				(-0.34)
suburbs of big city				-0.0365
				(-0.79)
town or small city				-0.0689
				(-1.39)
Constant	8.910***	3.309***	5.450***	5.348***
	(33.18)	(5.41)	(8.89)	(8.75)
Observations	28947	28947	28947	28947
Adjusted R^2	0.272	0.292	0.409	0.410

Table B7: Correlates of subjective well-being in 22 European countries in 2012.

	(1)	(2)	(3)	(4)
Age of respondent, calculated	-0.0696***	-0.0694***	-0.0454***	-0.0462***
	(-9.03)	(-10.54)	(-9.25)	(-9.24)
age squared / 100	0.0675***	0.0669***	0.0405***	0.0409***
	(10.65)	(12.26)	(10.34)	(10.08)
male	-0.115***	-0.138***	-0.116***	-0.102***
	(-4.15)	(-4.72)	(-4.52)	(-4.11)
separated	-0.763***	-0.626***	-0.466***	-0.458***
	(-7.02)	(-6.21)	(-6.01)	(-5.79)
divorced	-0.626***	-0.498***	-0.346***	-0.329***
	(-11.63)	(-7.84)	(-7.01)	(-6.84)
widowed	-0.788***	-0.634***	-0.579***	-0.587***
	(-11.71)	(-10.69)	(-10.07)	(-10.15)
never married	-0.534***	-0.432***	-0.392***	-0.372***
	(-11.79)	(-10.15)	(-10.71)	(-9.99)
children living at home	-0.146***	-0.0747*	0.00511	0.0175
	(-4.37)	(-2.40)	(0.20)	(0.66)
in education	0.0505	0.207**	0.102	0.102
	(0.84)	(3.13)	(1.76)	(1.76)
unemployed	-1.039***	-0.739***	-0.370***	-0.365***
	(-17.44)	(-8.67)	(-6.13)	(-5.90)
sick or disabled	-1.239***	-0.975***	-0.568***	-0.558***
	(-15.57)	(-10.26)	(-7.19)	(-7.19)
retired	-0.263***	-0.114*	-0.00911	-0.0126
	(-5.18)	(-2.30)	(-0.26)	(-0.35)
civil/military service	-0.629	-0.453	-0.505	-0.508
	(-1.91)	(-1.44)	(-1.70)	(-1.69)
housework	-0.238*	-0.0805	-0.0151	-0.0230
	(-2.43)	(-1.00)	(-0.24)	(-0.37)
other	-0.279**	-0.124	-0.0193	-0.0176
	(-3.33)	(-1.61)	(-0.27)	(-0.24)
Years of full-time education completed	0.0358***	0.0175*	-0.00928	-0.00752
	(3.91)	(2.17)	(-1.74)	(-1.47)
Number of people living regularly as member of household	0.0643**	-0.0138	0.0214	0.00983
	(3.40)	(-0.49)	(1.08)	(0.50)
ln of household income		0.522***	0.0768	0.0887
		(6.31)	(1.66)	(1.85)
insatfin==1			-0.410***	-0.410***
			(-7.34)	(-7.40)
insatfin==2			-1.103***	-1.100***
			(-10.69)	(-10.70)
insatfin==3			-1.994***	-1.986***
			(-15.88)	(-15.57)
index of social trust			0.159***	0.158***
			(15.90)	(15.89)
index of confidence			0.122***	0.119***
			(10.69)	(10.48)
having someone to discuss intimate things			0.420***	0.419***
			(4.73)	(4.68)
social gathering			0.328***	0.324***
			(9.85)	(9.69)
attending religious services				0.0574***
				(4.87)
a big city				-0.0883
				(-1.98)
suburbs of big city				-0.0924
				(-1.68)
town or small city				-0.0859*
				(-2.55)
Constant	9.080***	4.106***	6.641***	6.501***
	(43.75)	(5.52)	(14.80)	(13.61)
Observations	33668	33668	33668	33668
Adjusted R^2	0.280	0.297	0.409	0.411

B.3 Appendix B.3: Detailed Decomposition of Well-Being in Western European Countries

Table B8: Detailed decomposition of the well-being gap between 2006 and 2010 in Western European countries.

		index of well-being	
	Differential	*Explained*	*Unexplained*
Prediction_1	7.447***		
	(559.58)		
Prediction_2	7.483***		
	(622.38)		
Difference	−0.0364**		
	(−2.03)		
Age of respondent, calculated		0.000691	0.0557
		(0.55)	(0.37)
female		−0.000450	0.0244
		(−1.27)	(1.61)
mar_stat		−0.00976***	0.0101
		(−4.56)	(0.57)
household_size		−0.000952	0.0796**
		(−1.57)	(1.96)
empl_stat		−0.0148***	−0.0115
		(−7.73)	(−0.61)
education		−0.00289***	0.0168
		(−4.75)	(0.31)
income		−0.00251***	0.654**
		(−3.82)	(1.98)
financial dissatisfaction		−0.00424	0.0363*
		(−0.95)	(1.72)
social_trust		−0.0100***	0.0446
		(−3.38)	(0.67)
inst_trust		−0.00730***	0.0653
		(−3.58)	(1.11)
social_interactions		−0.00814***	0.0874
		(−3.78)	(1.34)
religion		−0.00154**	−0.0280
		(−2.49)	(−1.03)
domicle		0.00126**	−0.0150
		(2.43)	(−0.76)
Total		−0.0364**	$-9.49e-15$
		(−2.03)	(−0.00)
Constant			−0.851**
			(−2.28)
Observations	38339		

Table B9: Coefficients and X-values for 2006 and 2010 in Western European countries.

	β_{2010}	β_{2006}	β_{ref}	X_{2010}	X_{2006}
Age of respondent, calculated	−0.037	−0.034	−0.035	48.453	48.036
age squared / 100	0.036	0.028	0.032	26.585	26.111
male	−0.042	−0.092	−0.068	0.489	0.483
separated	−0.754	−0.762	−0.609	0.014	0.015
divorced	−0.370	−0.298	−0.351	0.097	0.092
widowed	−0.460	−0.489	−0.547	0.070	0.077
never married	−0.321	−0.376	−0.339	0.297	0.260
children living at home	0.001	0.011	0.009	0.366	0.379
in education	0.045	0.037	0.018	0.065	0.058
unemployed	−0.463	−0.491	−0.489	0.063	0.042
sick or disabled	−0.517	−0.875	−0.679	0.034	0.026
retired	0.081	0.190	0.102	0.215	0.206
civil/military service	−0.432	0.300	0.006	0.001	0.001
housework	0.032	0.031	0.019	0.080	0.097
other	−0.102	−0.006	−0.044	0.010	0.010
Years of full-time education completed	−0.008	−0.009	−0.011	12.957	12.694
Number of people living regularly as member of household	0.060	0.028	0.041	2.564	2.584
ln of household income	0.133	0.069	0.065	10.152	10.191
financial dissatisfaction	−0.470	−0.514	−0.542	0.808	0.800
index of social trust	0.168	0.160	0.164	5.605	5.667
index of confidence	0.113	0.101	0.101	5.706	5.779
having someone to discuss intimate things	0.515	0.490	0.521	0.923	0.924
social gathering	0.365	0.270	0.304	0.674	0.698
attending religious services	0.033	0.045	0.040	2.336	2.374
a big city	−0.066	−0.132	−0.096	0.152	0.160
suburbs of big city	−0.129	−0.051	−0.110	0.151	0.160
town or small city	−0.119	−0.077	−0.088	0.311	0.306
Constant	5.496	6.347	6.335	1.000	1.000

Table B10: Detailed decomposition of the well-being gap between 2010 and 2012 in Western European countries.

		index of well-being	
	Differential	*Explained*	*Unexplained*
Prediction_1	7.519***		
	(630.65)		
Prediction_2	7.447***		
	(559.58)		
Difference	0.0724***		
	(4.05)		
Age of respondent, calculated		−0.00148	0.0843
		(−1.17)	(0.56)
female		0.0000750	−0.00888
		(0.22)	(−0.59)
mar_stat		0.00194	−0.00787
		(0.96)	(−0.43)
household_size		−0.000219	−0.0414
		(−0.38)	(−1.02)
empl_stat		−0.00175	−0.0151
		(−0.95)	(−0.79)
education		−0.000339	−0.120**
		(−0.72)	(−2.20)
income		−0.00808***	−1.105**
		(−5.76)	(−3.12)
financial dissatisfaction		−0.0448***	−0.0922***
		(−9.69)	(−4.18)
social_trust		0.00263	−0.0439
		(0.90)	(−0.67)
inst_trust		0.00516**	−0.0894
		(2.53)	(−1.52)
social_interactions		0.0195***	−0.0176
		(8.10)	(−0.18)
religion		0.000776	0.0231
		(1.30)	(0.86)
domicle		−0.00170**	−0.0203
		(−3.07)	(−1.04)
Total		0.0724***	$-1.30e-13$
		(4.05)	(−0.00)
Constant			1.387***
			(3.45)
Observations	39634		

Table B11: Coefficients and X-values for 2010 and 2012 in Western European countries.

	β_{2012}	β_{2010}	β_{ref}	X_{2012}	X_{2010}
Age of respondent, calculated	−0.032	−0.037	−0.035	49.002	48.453
age squared / 100	0.031	0.036	0.032	27.136	26.585
male	−0.060	−0.042	−0.068	0.488	0.489
separated	−0.450	−0.754	−0.609	0.009	0.014
divorced	−0.397	−0.370	−0.351	0.097	0.097
widowed	−0.626	−0.460	−0.547	0.069	0.070
never married	−0.312	−0.321	−0.339	0.301	0.297
children living at home	−0.020	0.001	0.009	0.365	0.366
in education	0.037	0.045	0.018	0.068	0.065
unemployed	−0.468	−0.463	−0.489	0.072	0.063
sick or disabled	−0.739	−0.517	−0.679	0.031	0.034
retired	0.054	0.081	0.102	0.217	0.215
civil/military service	−0.238	−0.432	0.006	0.001	0.001
housework	−0.002	0.032	0.019	0.080	0.080
other	0.014	−0.102	−0.044	0.011	0.010
Years of full-time education completed	−0.017	−0.008	−0.011	12.988	12.957
Number of people living regularly as member of household	0.047	0.060	0.041	2.559	2.564
ln of household income	0.024	0.133	0.065	10.029	10.152
financial dissatisfaction	−0.580	−0.470	−0.542	0.890	0.808
index of social trust	0.160	0.168	0.164	5.621	5.605
index of confidence	0.097	0.113	0.101	5.758	5.706
having someone to discuss intimate things	0.545	0.515	0.521	0.974	0.923
social gathering	0.295	0.365	0.304	0.650	0.674
attending religious services	0.043	0.033	0.040	2.355	2.336
a big city	−0.134	−0.066	−0.096	0.170	0.152
suburbs of big city	−0.170	−0.129	−0.110	0.149	0.151
town or small city	−0.129	−0.119	−0.088	0.314	0.311
Constant	6.883	5.496	6.335	1.000	1.000

B.4 Appendix B.4: Detailed Decomposition of Well-Being in Eastern European Countries

Table B12: Detailed decomposition of the well-being gap between 2006 and 2008 in Eastern European countries.

	index of well-being		
	Differential	*Explained*	*Unexplained*
Prediction_1	5.890***		
	(205.75)		
Prediction_2	6.098***		
	(212.13)		
Difference	−0.208***		
	(−5.13)		
Age of respondent, calculated		−0.00741	−0.341
		(−1.20)	(−1.10)
female		0.00165*	−0.0341
		(1.65)	(−1.14)
mar_stat		−0.0144**	0.0458
		(−3.13)	(1.24)
household_size		−0.00211	0.0332
		(−1.09)	(0.38)
empl_stat		0.00197	−0.0608
		(0.91)	(−1.30)
education		0.00863***	−0.306**
		(3.99)	(−2.30)
income		−0.00373	0.604
		(−1.33)	(1.15)
financial dissatisfaction		−0.0336**	0.267**
		(−3.01)	(3.20)
social_trust		0.0175**	0.00980
		(2.93)	(0.12)
inst_trust		−0.0333***	0.0399
		(−5.36)	(0.62)
social_interactions		−0.0153***	0.0426
		(−3.30)	(0.40)
religion		−0.00387*	−0.0222
		(−1.92)	(−0.29)
domicle		−0.00263**	−0.0509
		(−2.52)	(−1.05)
Total		−0.208***	$-1.74e-13$
		(−5.10)	(−0.00)
Constant			−0.901
			(−1.35)
Observations	12637		

Table B13: Coefficients and X-values for 2006 and 2008 in Eastern European countries.

	β_{2008}	β_{2006}	β_{ref}	X_{2008}	X_{2006}
Age of respondent, calculated	−0.077	−0.066	−0.069	47.783	46.631
age squared / 100	0.061	0.055	0.056	26.266	24.969
male	−0.100	−0.020	−0.108	0.413	0.428
separated	−0.599	−1.004	−0.902	0.012	0.014
divorced	−0.540	−0.503	−0.438	0.086	0.073
widowed	−0.374	−0.587	−0.503	0.156	0.126
never married	−0.501	−0.566	−0.473	0.200	0.209
children living at home	−0.087	−0.064	0.047	0.430	0.474
in education	−0.044	0.031	0.076	0.072	0.080
unemployed	−0.532	−0.340	−0.300	0.050	0.055
sick or disabled	−0.613	−0.384	−0.459	0.018	0.020
retired	−0.039	0.165	−0.010	0.300	0.264
civil/military service	0.040	−0.355	−0.282	0.001	0.001
housework	0.163	−0.004	−0.045	0.089	0.087
other	−0.404	0.089	−0.170	0.005	0.006
Years of full-time education completed	0.019	0.044	0.032	12.078	11.811
Number of people living regularly as member of household	0.024	0.010	0.000	2.852	3.071
ln of household income	0.169	0.094	0.017	8.283	8.509
financial dissatisfaction	−0.562	−0.731	−0.700	1.586	1.538
index of social trust	0.154	0.152	0.164	4.283	4.176
index of confidence	0.151	0.141	0.152	3.595	3.814
having someone to discuss intimate things	0.514	0.443	0.471	0.899	0.885
social gathering	0.353	0.397	0.374	0.448	0.507
attending religious services	0.058	0.066	0.073	2.889	2.942
a big city	−0.117	0.059	0.009	0.265	0.265
suburbs of big city	−0.085	0.044	0.148	0.051	0.069
town or small city	−0.012	−0.015	0.005	0.330	0.306
Constant	5.114	6.015	6.854	1.000	1.000

Table B14: Detailed decomposition of the well-being gap between 2008 and 2010 in Eastern European countries.

		index of well-being	
	Differential	*Explained*	*Unexplained*
Prediction_1	6.063***		
	(286.46)		
Prediction_2	5.890***		
	(205.75)		
Difference	0.173***		
	(4.86)		
Age of respondent, calculated		−0.0358***	0.226
		(−6.55)	(0.82)
female		−0.000435	−0.00118
		(−0.52)	(−0.05)
mar_stat		−0.0101**	0.0172
		(−2.38)	(0.51)
household_size		−0.000587	−0.0498
		(−0.51)	(−0.66)
empl_stat		−0.00387*	0.0192
		(−1.67)	(0.46)
education		0.00626***	0.0697
		(3.37)	(0.59)
income		−0.00764	0.0310
		(−1.34)	(0.06)
financial dissatisfaction		−0.00239	−0.122
		(−0.25)	(−1.64)
social_trust		0.0319***	0.121*
		(5.94)	(1.72)
inst_trust		0.0333***	0.0484
		(5.96)	(0.85)
social_interactions		−0.00686*	0.0324
		(−1.66)	(0.35)
religion		−0.00803***	0.0586
		(−4.26)	(0.88)
domicle		0.000941	0.0576
		(1.33)	(1.36)
Total		0.173***	$1.20e-13$
		(4.88)	(0.00)
Constant			0.698
			(1.31)
Observations	17665		

Table B15: Coefficients and X-values for 2008 and 2010 in Eastern European countries.

	β_{2010}	β_{2008}	β_{ref}	X_{2010}	X_{2008}
Age of respondent, calculated	−0.071	−0.077	−0.069	49.724	47.783
age squared / 100	0.059	0.061	0.056	28.030	26.266
male	−0.103	−0.100	−0.108	0.417	0.413
separated	−1.283	−0.599	−0.902	0.003	0.012
divorced	−0.488	−0.540	−0.438	0.106	0.086
widowed	−0.447	−0.374	−0.503	0.146	0.156
never married	−0.366	−0.501	−0.473	0.231	0.200
children living at home	0.106	−0.087	0.047	0.418	0.430
in education	0.004	−0.044	0.076	0.060	0.072
unemployed	−0.061	−0.532	−0.300	0.069	0.050
sick or disabled	−0.610	−0.613	−0.459	0.013	0.018
retired	−0.037	−0.039	−0.010	0.335	0.300
civil/military service	0.255	0.040	−0.282	0.001	0.001
housework	0.006	0.163	−0.045	0.062	0.089
other	−0.019	−0.404	−0.170	0.005	0.005
Years of full-time education completed	0.025	0.019	0.032	12.271	12.078
Number of people living regularly as member of household	−0.024	0.024	0.000	2.733	2.852
ln of household income	0.182	0.169	0.017	7.821	8.283
financial dissatisfaction	−0.639	−0.562	−0.700	1.590	1.586
index of social trust	0.182	0.154	0.164	4.477	4.283
index of confidence	0.164	0.151	0.152	3.813	3.595
having someone to discuss intimate things	0.546	0.514	0.471	0.866	0.899
social gathering	0.367	0.353	0.374	0.472	0.448
attending religious services	0.078	0.058	0.073	2.779	2.889
a big city	0.029	−0.117	0.009	0.280	0.265
suburbs of big city	0.222	−0.085	0.148	0.057	0.051
town or small city	−0.005	−0.012	0.005	0.310	0.330
Constant	5.812	5.114	6.854	1.000	1.000

References

Algan, Y., Cahuc, P., and Shleifer, A. (2013). Teaching practices and social capital. *American Economic Journal: Applied Economics*, 5(3):189–210.

Allison, P. (2001). *Missing Data*. Series: Quantitative Applications in the Social Sciences, volume 136. Sage Publications.

Anand, P., Hunter, G., Carter, I., Dowding, K., Guala, F., and Van Hees, M. (2009). The development of capability indicators. *Journal of Human Development and Capabilities*, 10(1):125–152.

Anand, P., Hunter, G., and Smith, R. (2005). Capabilities and well-being: evidence based on the Sen–Nussbaum approach to welfare. *Social Indicators Research*, 74(1):9–55.

Arrow, K. (1972). Gifts and exchanges. *Philosophy & Public Affairs*, 1(4):343–362.

Balli, H. O. and Sørensen, B. E. (2013). Interaction effects in econometrics. *Empirical Economics*, 45(1):583–603.

Bárcena-Martín, E., Cortés-Aguilar, A., and Moro-Egido, A. I. (2016). Social comparisons on subjective well-being: The role of social and cultural capital. *Journal of Happiness Studies*, Published online: 07 June. doi:10.1007/s10902-016-9768-3.

Bartolini, S. (2014). Building sustainability through greater happiness. *The Economic and Labour Relations Review*, 25(4):587–602.

Bartolini, S. (forthcoming). *Manifesto for Happiness: Shifting Society from Money to Well-Being*. Pennsylvania University Press.

Bartolini, S. and Bilancini, E. (2010). If not only GDP, what else? Using relational goods to predict the trends of subjective well-being. *International Review of Economics*, 57(2):199–213.

Bartolini, S., Bilancini, E., and Pugno, M. (2013a). Did the decline in social connections depress Americans' happiness? *Social Indicators Research*, 110(3):1033–1059.

Bartolini, S., Bilancini, E., and Sarracino, F. (2013b). Predicting the trend of well-being in Germany: How much do comparisons, adaptation and sociability matter? *Social Indicators Research*, 114(2):169–191.

Bartolini, S. and Bonatti, L. (2002). Environmental and social degradation as the engine of economic growth. *Ecological Economics*, 43(1):1–16.

Bartolini, S. and Bonatti, L. (2003). Endogenous growth and negative externalities. *Journal of Economics*, 79(2):123–144.

Bartolini, S. and Bonatti, L. (2008). Endogenous growth, decline in social capital and expansion of market activities. *Journal of Economic Behavior & Organization*, 67(3):917–926.

Bartolini, S. and Sarracino, F. (2014). Happy for how long? How social capital and economic growth relate to happiness over time. *Ecological Economics*, 108:242–256.

Bartolini, S. and Sarracino, F. (2015). The dark side of Chinese growth: Declining social capital and well-being in times of economic boom. *World Development*, 74:333–351.

Baum, C. F., Lewbel, A., Schaffer, M. E., and Talavera, O. (2012). Instrumental variables estimation using heteroskedasticity-based instruments. In *United Kingdom Stata User's Group Meetings*, volume 7.

Becchetti, L., Corrado, L., and Conzo, P. (2016). Sociability, altruism and well-being. *Cambridge Journal of Economics*, Published online: July 25. doi:10.1093/cje/bew033.

Becchetti, L., Massari, R., and Naticchioni, P. (2010). Why has happiness inequality increased? Suggestions for promoting social cohesion. *ECINEQ Working Paper Series*, 177.

Becchetti, L., Massari, R., and Naticchioni, P. (2014). The drivers of happiness inequality: Suggestions for promoting social cohesion. *Oxford Economic Papers*, 66:419–442.

Becchetti, L. and Pelloni, A. (2013). What are we learning from the life satisfaction literature? *International Review of Economics*, 60:113–155.

Becchetti, L., Pelloni, A., and Rossetti, F. (2008). Relational goods, sociability, and happiness. *Kyklos*, 61(3):343–363.

Becchetti, L., Ricca, E. G., and Pelloni, A. (2009). The 60es turnaround as a test on the causal relationship between sociability and happiness. *SOEPpapers on Multidisciplinary Panel Data Research*, 209.

Becchetti, L., Ricca, E. G., and Pelloni, A. (2012). The relationship between social leisure and life satisfaction: Causality and policy implications. *Social Indicators Research*, 108(3):453–490.

Becchetti, L., Trovato, G., and Londono Bedoya, D. A. (2011). Income, relational goods and happiness. *Applied Economics*, 43(3):273–290.

Becker, A., Deckers, T., Dohmen, T. J., Falk, A., and Kosse, F. (2012). The relationship between economic preferences and psychological personality measures. *Annual Review of Economics*, 4:453–478.

Belk, R. (1985). Materialism: Trait aspects of living in the material world. *Journal of Consumer Research*, 12:265 – 280.

Benjamin, D. J., Heffetz, O., Kimball, M. S., and Rees-Jones, A. (2014a). Can marginal rates of substitution be inferred from happiness data? Evidence from residency choices. *The American Economic Review*, 104(11):3498–3528.

Benjamin, D. J., Heffetz, O., Kimball, M. S., and Szembrot, N. (2014b). Beyond happiness and satisfaction: Toward well-being indices based on stated preference. *The American Economic Review*, 104(9):2698–2735.

Berkman, L. and Syme, S. (1979). Social networks, host resistance and mortality: a nine-year follow-up study of Alameda country residents. *American Journal of Epidemiology*, 109:186 – 204.

Berkman, L. F. (1986). Social networks, support, and health: taking the next step forward. *American Journal of Epidemiology*, 123(4):559–562.

Beugelsdijk, S., de Groot, H., and van Schaik, A. (2004). Trust and economic growth: a robustness analysis. *Oxford Economic Papers*, 56:118–134.

Bjørnskov, C. (2008). Social capital and happiness in the United States. *Applied Research in Quality of Life*, 3(1):43–62.

Blanchflower, D. G. and Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics*, 88(7):1359–1386.

Blinder, A. (1973). Wage discrimination: reduced-form and structural estimates. *Journal of Human Resources*, 8(4):436–455.

Boehm, J. K. and Lyubomirsky, S. (2008). Does happiness promote career success? *Journal of Career Assessment*, 16(1):101–116.

Borghans, L., Duckworth, A. L., Heckman, J. J., and Ter Weel, B. (2008). The economics and psychology of personality traits. *Journal of Human Resources*, 43(4):972–1059.

Boschi, M., Girardi, A., and Ventura, M. (2014). Partial credit guarantees and smes financing. *Journal of Financial Stability*, 15:182–194.

Bowles, S. and Gintis, H. (2002). Social capital and community governance. *The Economic Journal*, 112(483):F419–F436.

Boyce, C. J. (2010). Understanding fixed effects in human well-being. *Journal of Economic Psychology*, 31(1):1–16.

Boyce, C. J., Brown, G. D., and Moore, S. C. (2010a). Money and happiness rank of income, not income, affects life satisfaction. *Psychological Science*, 21(4):471–475.

Boyce, C. J. and Wood, A. M. (2011). Personality and the marginal utility of income: Personality interacts with increases in household income to determine life satisfaction. *Journal of Economic Behavior & Organization*, 78(1):183–191.

Boyce, C. J., Wood, A. M., and Brown, G. D. (2010b). The dark side of conscientiousness: Conscientious people experience greater drops in life satisfaction following unemployment. *Journal of Research in Personality*, 44(4):535–539.

Boyce, C. J., Wood, A. M., Daly, M., and Sedikides, C. (2015). Personality change following unemployment. *Journal of Applied Psychology*, 100(4):991–1011.

Boyce, C. J., Wood, A. M., and Powdthavee, N. (2013). Is personality fixed? Personality changes as much as "variable" economic factors and more strongly predicts changes to life satisfaction. *Social Indicators Research*, 111(1):287–305.

Brambor, T. (2005). Understanding interaction models: Improving empirical analyses. *Political Analysis*, 14(1):63–82.

Braumoeller, B. (2004). Hypothesis testing and multiplicative interaction terms. *International Organization*, 58(4):807–820.

Brereton, F., Clinch, J. P., and Ferreira, S. (2008). Happiness, geography and the environment. *Ecological Economics*, 65(2):386–396.

Brockmann, H., Delhey, J., Welzel, C., and Yuan, H. (2009). The China puzzle: Falling happiness in a rising economy. *Journal of Happiness Studies*, 10:387–405.

Brown, G. D., Gardner, J., Oswald, A. J., and Qian, J. (2008). Does wage rank affect employees well-being? *Industrial Relations: A Journal of Economy and Society*, 47(3):355–389.

Brown, T. T. (2014). How effective are public health departments at preventing mortality? *Economics & Human Biology*, 13:34–45.

Bruni, L. and Stanca, L. (2008). Watching alone: relational goods, television and happiness. *Journal of Economic Behavior & Organization*, 65(3):506–528.

Burger, J. M. and Caldwell, D. F. (2000). Personality, social activities, job-search behavior and interview success: Distinguishing between PANAS trait positive affect and NEO extraversion. *Motivation and Emotion*, 24(1):51–62.

Caporale, G. M., Georgellis, Y., Tsitsianis, N., and Yin, Y. P. (2009). Income and happiness across Europe: Do reference values matter? *Journal of Economic Psychology*, 30(1):42–51.

Carlsson, F., Johansson-Stenman, O., and Martinsson, P. (2007). Do you enjoy having more than others? Survey evidence of positional goods. *Economica*, 74(296):586–598.

Carpiano, R. M. (2007). Neighborhood social capital and adult health: an empirical test of a Bourdieu-based model. *Health & Place*, 13(3):639–655.

Celse, J. (2016). An experimental investigation of the impact of absolute and relative inequalities on individual satisfaction. *Journal of Happiness Studies*, Published online: 20 May. doi:10.1007/s10902-016-9757-6.

Cetre, S., Clark, A., and Senik, C. (2016). Happy people have children: Choice and self-selection into parenthood. *IZA Discussion Paper*, No. 9880.

Chan, K. and Prendergast, G. (2007). Materialism and social comparison among adolescents. *Social Behavior and Personality: an international journal*, 35(2):213–228.

Chen, M.-H. and Wang, M.-C. (2008). Social networks and a new venture's innovative capability: the role of trust within entrepreneurial teams. *R&D Management*, 38(3):253–264.

Chou, Y. K. (2006). Three simple models of social capital and economic growth. *The Journal of Socio-Economics*, 35(5):889–912.

Clark, A., Flèche, S., and Senik, C. (2012). The great happiness moderation. *IZA DP No. 6761*.

Clark, A., Senik, C., and Yamada, K. (2015). When experienced and decision utility concur: The case of income comparisons. *IZA DP No. 9189*.

Clark, A. E. (2003). Unemployment as a social norm: Psychological evidence from panel data. *Journal of Labor Economics*, 21(2):323–351.

Clark, A. E., Frijters, P., and Shields, M. A. (2008). Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles. *Journal of Economic Literature*, 46(1):95–144.

Clark, A. E. and Oswald, A. J. (1996). Satisfaction and comparison income. *Journal of Public Economics*, 61(3):359–381.

Clark, A. E. and Oswald, A. J. (2002). A simple statistical method for measuring how life events affect happiness. *International Journal of Epidemiology*, 31(6):1139–1144.

Clark, A. E. and Senik, C. (2010). Who compares to whom? The anatomy of income comparisons in Europe. *The Economic Journal*, 120(544):573–594.

Clifton, D. O. and Harter, J. K. (2003). Strengths investment. In Cameron, K. S., Dutton, J. E., and Quinn, R. E., editors, *Positive Organizational Scholarship*, pages 111–121. San Francisco: Berrett-Koehler.

Cohen, P. and Cohen, J. (1996). *Life Values and Adolescent Mental Health*. Psychology Press, Erlbaum, Mahwah, NJ.

Cohen, S. and Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2):310–357.

Costa, D. and Kahn, M. (2003). Understanding the decline in social capital, 1952-1998. *Kyklos*, 56:17–46.

Côté, S. (1999). Affect and performance in organizational settings. *Current Directions in Psychological Science*, 8(2):65–68.

Cropanzano, R. and Wright, T. A. (2001). When a "happy" worker is really a "productive" worker: A review and further refinement of the happy-productive worker thesis. *Consulting Psychology Journal: Practice and Research*, 53(3):182–199.

D'Ambrosio, C. and Frick, J. (2007). Income satisfaction and relative deprivation: An empirical link. *Social Indicators Research*, 81(3):497–519.

D'Ambrosio, C. and Frick, J. (2012). Individual well-being in a dynamic perspective. *Economica*, 79:284–302.

Danner, D. D., Snowdon, D. A., and Friesen, W. V. (2001). Positive emotions in early life and longevity: findings from the nun study. *Journal of Personality and Social Psychology*, 80(5):804–813.

De Carolis, D. M. and Saparito, P. (2006). Social capital, cognition, and entrepreneurial opportunities: A theoretical framework. *Entrepreneurship Theory and Practice*, 30(1):41–56.

De Neve, J.-E. and Oswald, A. J. (2012). Estimating the influence of life satisfaction and positive affect on later income using sibling fixed effects. *Proceedings of the National Academy of Sciences of the United States of America*, 109(49):19953–19958.

Deaton, A. and Stone, A. A. (2013). Two happiness puzzles. *The American Economic Review*, 103(3):591–597.

Decancq, K., Fleurbaey, M., and Schokkaert, E. (2015a). Chapter 2: Inequality, Income, and Well-Being. In Atkinson, A. B. and Bourguignon, F., editors, *Handbook of Income Distribution*, volume 2, pages 67–140. Elsevier.

Decancq, K., Fleurbaey, M., and Schokkaert, E. (2015b). Happiness, equivalent incomes and respect for individual preferences. *Economica*, 82(s1):1082–1106.

Decancq, K. and Schokkaert, E. (2016). Beyond GDP: Using equivalent incomes to measure well-being in Europe. *Social Indicators Research*, 126(1):21–55.

Deci, E. (1971). Effects of externally mediated rewards on intrinsic motivations. *Journal of Personality and Social Psychology*, 18(1):105–115.

Delhey, J. and Kohler, U. (2011). Is happiness inequality immune to income inequality? New evidence through instrument-effect-corrected standard deviations. *Social Science Research*, 40(3):742–756.

Denny, K. and Oppedisano, V. (2013). The surprising effect of larger class sizes: Evidence using two identification strategies. *Labour Economics*, 23:57–65.

Di Maria, C. H., Peroni, C., and Sarracino, F. (2014). Happiness matters: the role of well-being in productivity. *MPRA Paper*, No. 56983.

Di Tella, R., Haisken-De New, J., and MacCulloch, R. (2010). Happiness adaptation to income and to status in an individual panel. *Journal of Economic Behavior & Organization*, 76(3):834–852.

Diener, E. (2006). Guidelines for national indicators of subjective well-being and ill-being. *Journal of Happiness Studies*, 7:397–404.

Diener, E. and Fujita, F. (1995). Resources, personal strivings, and subjective well-being: A nomothetic and idiographic approach. *Journal of Personality and Social Psychology*, 68(5):926.

Diener, E., Nickerson, C., Lucas, R. E., and Sandvik, E. (2002). Dispositional affect and job outcomes. *Social Indicators Research*, 59(3):229–259.

Diener, E., Sandvik, E., Seidlitz, L., and Diener, M. (1993). The relationship between income and subjective well-being: relative or absolute? *Social Indicators Research*, 28:195–223.

Diener, E. and Seligman, M. E. (2009). Beyond money: Toward an economy of well-being. In Diener, E., editor, *The Science of Well-Being*, pages 201–265. Springer.

Diener, E. and Suh, E. (1997). Measuring quality of life: economic, social and subjective indicators. *Social Indicators Research*, 40:189–216.

Dolan, P., Peasgood, T., and White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology*, 29(1):94–122.

Dolan, P. and White, M. P. (2007). How can measures of subjective well-being be used to inform public policy? *Perspectives on Psychological Science*, 2(1):71–85.

Duesenberry, J. S. (1949). *Income, Saving, and the Theory of Consumer Behavior*. Harvard University Press, Cambridge and London.

Durand, M. (2015). The OECD Better Life Initiative: How's Life? and the Measurement of Well-Being. *Review of Income and Wealth*, 61(1):4–17.

Dutta, I. and Foster, J. (2013). Inequality of happiness in the US: 1972–2010. *Review of Income and Wealth*, 59(3):393–415.

Easterlin, R. (1974). Does economic growth improve the human lot? Some empirical evidence. In David, P. and Melvin, W., editors, *Nations and Households in Economic Growth*, pages 98–125. CA: Stanford University Press.

Easterlin, R. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behaviour & Organization*, 27(1):35–47.

Easterlin, R. A. (2003). Explaining happiness. *Proceedings of the National Academy of Sciences*, 100(19):11176–11183.

Easterlin, R. A., Angelescu, L., Switek, M., Sawangfa, O., and Zweig, J. S. (2010). The happiness-income paradox revisited. *Proceedings of the National Academy of Sciences*, 107(52):1–6.

Emran, M. S. and Shilpi, F. (2012). The extent of the market and stages of agricultural specialization. *Canadian Journal of Economics/Revue canadienne d'économique*, 45(3):1125–1153.

ESS (2012). ESS Round 6: European Social Survey Round 6 Data. Data file edition 2.1. Norwegian Social Science Data Services, Norway - Data archive and distributor of ESS data.

ESS (2014). ESS Round 6: European Social Survey. ESS-6 2012 Documentation Report. Edition 2.1. Bergen, European Social Survey Data Archive, Norwegian Social Science Data Services.

Eurofound (2012a). *Experiencing the economic crisis in the EU: Changes in living standards, deprivation and trust*. Publications Office of the European Union, Luxembourg.

Eurofound (2012b). *Third European Quality of Life Survey – Quality of life in Europe: Impacts of the crisis*. Publications Office of the European Union, Luxembourg.

Eurofound (2014). *Third European Quality of Life Survey – Quality of life in Europe: Families in the economic crisis*. Publications Office of the European Union, Luxembourg.

Eurostat (2015). *Quality of Life in Europe: Facts and Views*. Luxembourg: Publications Office of the European Union.

Falk, A. and Knell, M. (2004). Choosing the Joneses: Endogenous goals and reference standards. *The Scandinavian Journal of Economics*, 106(3):417–435.

Ferrer-i-Carbonell, A. (2005). Income and well-being: An empirical analysis of the comparison income effect. *Journal of Public Economics*, 89(5):997–1019.

Ferrer-i-Carbonell, A. (2013). Happiness economics. *SERIEs - Journal of the Spanish Economic Association*, 4(1):35–60.

Ferrer-i-Carbonell, A. and Frijters, P. (2004). How important is methodology for the estimates of the determinants of happiness? *The Economic Journal*, 114(497):641–659.

Ferrer-i-Carbonell, A. and Gërxhani, K. (2016). Tax evasion and well-being: A study of the social and institutional context in Central and Eastern Europe. *European Journal of Political Economy*, Available online: 20 September. doi:10.1016/j.ejpoleco.2016.09.004.

Ferrer-i-Carbonell, A. and Van Praag, B. (2002). The subjective costs of health losses due to chronic diseases. An alternative model for monetary appraisal. *Health Economics*, 11(8):709–722.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7(2):117–140.

Fliessbach, K., Weber, B., Trautner, P., Dohmen, T., Sunde, U., Elger, C. E., and Falk, A. (2007). Social comparison affects reward-related brain activity in the human ventral striatum. *Science*, 318(5854):1305–1308.

Fogaça, N. and Junior, F. A. C. (2016). Is "happy worker" more productive. *Management*, 4(4):149–160.

Frank, R. H. (2005). Positional externalities cause large and preventable welfare losses. *The American Economic Review*, 95(2):137–141.

Frey, B., Luechinger, S., and Stutzer, A. (2009). The life satisfaction approach to the value of public goods: the case of terrorism. *Public Choice*, 138:317–345.

Frey, B. S., Gallus, J., and Steiner, L. (2014). Open issues in happiness research. *International Review of Economics*, 61:115–125.

Frey, B. S. and Stutzer, A. (2000). Happiness, economy and institutions. *The Economic Journal*, 110(466):918–938.

Frey, B. S. and Stutzer, A. (2009). Should national happiness be maximized? In Dutt, A. K. and Radcliff, B., editors, *Happiness, Economics and Politics: Towards a Multi-Disciplinary Approach*, pages 301–323. Edward Elgar Publishing.

Frey, B. S. and Stutzer, A. (2012). The use of happiness research for public policy. *Social Choice and Welfare*, 38(4):659–674.

Friehe, T., Mechtel, M., and Pannenberg, M. (2014). Positional income concerns: Prevalence and relationship with personality and economic preferences. *SOEPpapers on Multidisciplinary Panel Data Research*, 712.

Frijters, P. and Van Praag, B. (1998). Climate equivalence scales and the effects of climate change on Russian welfare and well-being. *Climatic Change*, 39:61–81.

Gallie, D. (2013a). *Economic Crisis, Quality of Work, and Social Integration: The European Experience*. Oxford: Oxford University Press.

Gallie, D. (2013b). Economic crisis, quality of work and social integration: Topline results from Rounds 2 and 5 of the European Social Survey. *ESS Topline Results Series, Issue 3*. London: Centre for Comparative Social Surveys.

Gao, W. and Smyth, R. (2015). Education expansion and returns to schooling in urban China, 2001–2010: Evidence from three waves of the China Urban Labor Survey. *Journal of the Asia Pacific Economy*, 20(2):178–201.

Gasper, D. (2007). What is the capability approach?: Its core, rationale, partners and dangers. *The Journal of Socio-Economics*, 36(3):335–359.

George, J. M. (1990). Personality, affect, and behavior in groups. *Journal of Applied Psychology*, 75(2):107–116.

George, J. M. and Brief, A. P. (1992). Feeling good – doing good: a conceptual analysis of the mood at work-organizational spontaneity relationship. *Psychological Bulletin*, 112(2):310–329.

Gielen, A. C. and Ours, J. C. (2014). Unhappiness and job finding. *Economica*, 81(323):544–565.

Glaeser, E. L., Laibson, D., and Sacerdote, B. (2002). An economic approach to social capital. *The Economic Journal*, 112(483):F437–F458.

Goerke, L. and Pannenberg, M. (2015). Direct evidence for income comparisons and subjective well-being across reference groups. *Economics Letters*, 137:95–101.

Graham, C. (2005a). The economics of happiness. Insights on globalization from a novel approach. *World Economics*, 6(3):41–55.

Graham, C. (2005b). Insights on development from the economics of happiness. *The World Bank Research Observer*, 20(2):201–231.

Graham, C., Eggers, A., and Sukhtankar, S. (2004). Does happiness pay?: An exploration based on panel data from Russia. *Journal of Economic Behavior & Organization*, 55(3):319–342.

Graham, C. and Nikolova, M. (2015). Bentham or Aristotle in the development process? An empirical investigation of capabilities and subjective well-being. *World Development*, 68:163–179.

Greene, W. H. (2008). *Econometric Analysis. 5th Edition*. Prentice Hall, Upper Saddle River, NJ.

Groot, W., van den Brink, H. M., and Plug, E. (2004). Money for health: the equivalent variation of cardiovascular diseases. *Health Economics*, 13(9):859–872.

Groves, M. O. (2005). How important is your personality? Labor market returns to personality for women in the US and UK. *Journal of Economic Psychology*, 26(6):827–841.

Harter, J. and Schmidt, F. (2000). Validation of a performance-related and actionable management tool: A meta-analysis and utility analysis. *Technical Paper. The Gallup Organization, Lincoln, NE*.

Harter, J. K., Schmidt, F. L., and Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis. *Journal of Applied Psychology*, 87(2):268–279.

Harter, J. K., Schmidt, F. L., and Keyes, C. L. (2003). Well-being in the workplace and its relationship to business outcomes: A review of the Gallup studies. In Keyes, C. L. M. and Haidt, J., editors, *Flourishing: Positive Psychology and the Life Well-Lived*, pages 205–224. Washington, DC: American Psychological Association.

Hawe, P. and Shiell, A. (2000). Social capital and health promotion: a review. *Social Science & Medicine*, 51(6):871–885.

Heaney, J.-G., Goldsmith, R. E., and Jusoh, W. J. W. (2005). Status consumption among Malaysian consumers: Exploring its relationships with materialism and attention-to-social-comparison-information. *Journal of International Consumer Marketing*, 17(4):83–98.

Heckman, J. J. and Kautz, T. (2013). Fostering and measuring skills: Interventions that improve character and cognition. *IZA DP No. 7750*.

Heineck, G. and Anger, S. (2010). The returns to cognitive abilities and personality traits in Germany. *Labour Economics*, 17(3):535–546.

Heinz, M. and Schumacher, H. (2015). Signaling cooperation. *SAFE Working Paper*, No. 120.

Helliwell, J. (2001). Social capital, the economy and wellbeing. In *The Review of Economic Performance: The Longest Decade: Canada in the 1990s*. Centre for the Study of Living Standards, Ottawa, Canada.

Helliwell, J. (2006). Well-being, social capital and public policy: what's new? *The Economic Journal*, 116(510):34–45.

Helliwell, J. (2007). Well-being and social capital: does suicide pose a puzzle? *Social Indicators Research*, 81(3):455–496.

Helliwell, J. and Barrington-Leigh, C. (2010). Viewpoint: measuring and understanding subjective well-being. *Canadian Journal of Economics*, 43:729–753.

Helliwell, J. and Putnam, R. (1995). Economic growth and social capital in Italy. *Eastern Economic Journal*, 21(3):295–307.

Helliwell, J. and Wang, S. (2011). Trust and wellbeing. *International Journal of Wellbeing*, 1(1):42–78.

Helliwell, J. F. (2011). Institutions as enablers of wellbeing: The Singapore prison case study. *International Journal of Wellbeing*, 1(2).

Helliwell, J. F., Huang, H., and Wang, S. (2014). Social capital and well-being in times of crisis. *Journal of Happiness Studies*, 15(1):145–162.

Helliwell, J. F. and Putnam, R. D. (2004). The social context of well-being. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 359:1435–1446.

Hermalin, B. E. and Isen, A. M. (2008). A model of the effect of affect on economic decision making. *Quantitative Marketing and Economics*, 6(1):17–40.

Hirschman, A. O. and Rothschild, M. (1973). The changing tolerance for income inequality in the course of economic development. *The Quarterly Journal of Economics*, 87(4):544–566.

House, J. S., Robbins, C., and Metzner, H. L. (1982). The association of social relationships and activities with mortality: prospective evidence from the Tecumseh Community Health Study. *American Journal of Epidemiology*, 116(1):123–140.

Ichida, Y., Kondo, K., Hirai, H., Hanibuchi, T., Yoshikawa, G., and Murata, C. (2009). Social capital, income inequality and self-rated health in Chita peninsula, Japan: a multilevel analysis of older people in 25 communities. *Social Science & Medicine*, 69(4):489–499.

Inkeles, A. (2000). Measuring social capital and its consequences. *Policy Sciences*, 33(3-4):245–268.

Jann, B. (2008). A Stata implementation of the Blinder-Oaxaca decomposition. *Stata Journal*, 8:453–459.

Judge, T. A., Thoresen, C. J., Bono, J. E., and Patton, G. K. (2001). The job satisfaction – job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, 127(3):376–407.

Kahneman, D. and Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences of the United States of America*, 107(38):16489–16493.

Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., and Stone, A. (2004). Toward national well-being accounts. *The American Economic Review*, 94(2):429–434.

Kahneman, D. and Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, pages 263–291.

Kapteyn, A. (1985). Utility and economics. *De Economist*, 133:1–20.

Kasser, T. (2002). *The High Price of Materialism*. MIT Press, Cambridge, MA.

Kasser, T., Ryan, R. M., Zax, M., and Sameroff, A. J. (1995). The relations of maternal and social environments to late adolescents' materialistic and prosocial values. *Developmental Psychology*, 31(6):907–914.

Kasser, T. and Sheldon, K. M. (2000). Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science*, 11(4):348–351.

Keyes, C. L. M., Hysom, S. J., and Lupo, K. L. (2000). The positive organization: Leadership legitimacy, employee well-being, and the bottom line. *The Psychologist-Manager Journal*, 4(2):143–153.

Keyes, C. L. M. and Ryff, C. D. (1998). Generativity in adult lives: Social structural contours and quality of life consequences. In McAdams, D. and de St. Aubin, E., editors, *Generativity and Adult Development: Perspectives on Caring for and Contributing to the Next Generation*, pages 227–263. Washington, DC: American Psychological Association.

Killingsworth, M. A. and Gilbert, D. T. (2010). A wandering mind is an unhappy mind. *Science*, 330(6006):932–932.

Knack, S. and Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly Journal of Economics*, 112(4):1251–1288.

Kotan, M. (2010). Freedom or happiness? Agency and subjective well-being in the capability approach. *The Journal of Socio-Economics*, 39(3):369–375.

Krause, A. (2013). Don‘t worry, be happy? Happiness and reemployment. *Journal of Economic Behavior & Organization*, 96:1–20.

Krueger, A. B. and Schkade, D. A. (2008). The reliability of subjective well-being measures. *Journal of Public Economics*, 92(8-9):1833–1845. Special Issue: Happiness and Public Economics.

Krugman, P. and Wells, R. (2013). *Economics. Third Edition.* Worth Publishers, New York, NY.

Lang, R. E. and Hornburg, S. P. (1998). What is social capital and why is it important to public policy? *Housing Policy Debate*, 9(1):1–16.

Layard, R. (2005). *Happiness: Lessons from a New Science.* The Penguin Press, New York.

Leung, A., Kier, C., Fung, T., Fung, L., and Sproule, R. (2013). Searching for happiness: The importance of social capital. In *The Exploration of Happiness*, pages 247–267. Springer.

Levinson, A. (2009). Valuing air quality using happiness data: The case of air quality. *NBER Working Paper Series*, N15156.

Lewbel, A. (2012). Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models. *Journal of Business & Economic Statistics*, 30(1):67–80.

Lin, F. (2015). Estimating the effect of the internet on international trade. *The Journal of International Trade & Economic Development*, 24(3):409–428.

Liñán, F. and Santos, F. J. (2007). Does social capital affect entrepreneurial intentions? *International Advances in Economic Research*, 13(4):443–453.

Liu, Z. and Shang, Q. (2012). Individual well-being in urban China: The role of income expectations. *China Economic Review*, 23(4):833–849.

Lochner, K., Kawachi, I., and Kennedy, B. P. (1999). Social capital: a guide to its measurement. *Health & Place*, 5(4):259–270.

Lomas, J. (1998). Social capital and health: implications for public health and epidemiology. *Social Science & Medicine*, 47(9):1181–1188.

Lucas, R. E., Clark, A. E., Georgellis, Y., and Diener, E. (2004). Unemployment alters the set point for life satisfaction. *Psychological Science*, 15(1):8–13.

Lucas, R. E. and Diener, E. (2003). The happy worker: Hypotheses about the role of positive affect in worker productivity. In Barrik, M. R. and Ryan, A. M., editors, *Personality and Work: Reconsidering the Role of Personality in Organizations*, pages 30–59. San Francisco, CA: Jossey-Bass.

Luechinger, S. (2009). Valuing air quality using the life satisfaction approach. *The Economic Journal*, 119(536):482–515.

Luechinger, S. and Raschky, P. A. (2009). Valuing flood disasters using the life satisfaction approach. *Journal of Public Economics*, 93(3):620–633.

Luttmer, E. (2005). Neighbors as negatives: relative earnings and well-being. *The Quarterly Journal of Economics*, 120(3):963–1002.

Lyubomirsky, S. and Ross, L. (1997). Hedonic consequences of social comparison: A contrast of happy and unhappy people. *Journal of Personality and Social Psychology*, 73(6):1141–1157.

MacKerron, G. (2012). Happiness economics from 35 000 feet. *Journal of Economic Surveys*, 26(4):705–735.

Mansyur, C., Amick, B. C., Harrist, R. B., and Franzini, L. (2008). Social capital, income inequality, and self-rated health in 45 countries. *Social Science & Medicine*, 66(1):43–56.

Marks, G. N. and Fleming, N. (1999). Influences and consequences of well-being among Australian young people: 1980–1995. *Social Indicators Research*, 46(3):301–323.

Matzler, K., Renzl, B., Mooradian, T., von Krogh, G., and Mueller, J. (2011). Personality traits, affective commitment, documentation of knowledge, and knowledge sharing. *The International Journal of Human Resource Management*, 22(02):296–310.

Matzler, K., Renzl, B., Müller, J., Herting, S., and Mooradian, T. A. (2008). Personality traits and knowledge sharing. *Journal of Economic Psychology*, 29(3):301–313.

Mavridis, D. (2010). Can subjective well-being predict unemployment length? *World Bank Policy Research Working Paper Series*, Vol. 5293.

McBride, M. (2001). Relative-income effects on subjective well-being in the cross-section. *Journal of Economic Behavior & Organization*, 45(3):251–278.

McBride, M. (2010). Money, happiness, and aspirations: An experimental study. 74:262–276.

McHoskey, J. W. (1999). Machiavellianism, intrinsic versus extrinsic goals, and social interest: A self-determination theory analysis. *Motivation and Emotion*, 23(4):267–283.

Mikucka, M. and Sarracino, F. (2014). Making economic growth and well-being compatible: The role of social capital and income inequality. *MPRA Paper No. 59695*.

Mishra, V. and Smyth, R. (2015). Estimating returns to schooling in urban China using conventional and heteroskedasticity-based instruments. *Economic Modelling*, 47:166–173.

Mueller, G. and Plug, E. (2006). Estimating the effect of personality on male and female earnings. *Industrial & Labor Relations Review*, 60(1):3–22.

Narayan, D. and Pritchett, L. (1999). Cents and sociability: Household income and social capital in rural Tanzania. *Economic Development and Cultural Change*, 47(4):871–897.

Nussbaum, M. (2011). *Creating Capabilities: The Human Development Approach*. Belknap Press of Harvard University Press.

Nyhus, E. K. and Pons, E. (2005). The effects of personality on earnings. *Journal of Economic Psychology*, 26(3):363–384.

Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, 14:693–709.

O'Connor, K. J. (2016). Happier people are less likely to be unemployed: Evidence from longitudinal data in the U.S. and Germany. *Unpublished Working Paper*, University of Southern California. Version: October 22.

OECD (2001). *The Well-being of Nations: The Role of Human and Social Capital*, chapter 3: The evidence on social capital, pages 39–63. OECD, Paris.

Oishi, S. and Kesebir, S. (2015). Income inequality explains why economic growth does not always translate to an increase in happiness. *Psychological Science*, 26(10):1630–1638.

Oishi, S., Kesebir, S., and Diener, E. (2011). Income inequality and happiness. *Psychological Science*, 22(9):1095–1100.

Olver, J. M. and Mooradian, T. A. (2003). Personality traits and personal values: a conceptual and empirical integration. *Personality and Individual Differences*, 35(1):109–125.

Onyx, J. and Bullen, P. (2000). Measuring social capital in five communities. *The Journal of Applied Behavioral Science*, 36(1):23–42.

Oswald, A. J. and Powdthavee, N. (2008). Death, happiness, and the calculation of compensatory damages. *The Journal of Legal Studies*, 37(S2):S217–S251.

Oswald, A. J. and Proto, Eugenio Sgroi, D. (2015). Happiness and productivity. *Journal of Labor Economics*, 33(4):789–822.

Pavot, W. and Diener, E. (2004). Findings on subjective well-being: Applications to public policy, clinical interventions, and education. In Linley, P. A. and Joseph, S., editors, *Positive psychology in practice*, pages 679–692. Hoboken, NJ: Wiley.

Paxton, P. (1999). Is social capital declining in the United States? A multiple indicator assessment. *American Journal of Sociology*, 105(1):88–127.

Plug, E. J. S. and van Praag, B. M. S. (1995). Family equivalence scales with a narrow and broad welfare context. *Journal of Income Distribution*, 4(2):171–186.

Polavieja, J. (2013). Economic crisis, political legitimacy, and social cohesion. In Gallie, D., editor, *Economic Crisis, Quality of Work, and Social Integration: The European Experience*, chapter 10, pages 256–278. Oxford: Oxford University Press.

Powdthavee, N. (2008). Putting a price tag on friends, relatives and neighbours: using surveys of life satisfaction to value social relationships. *The Journal of Socio-Economics*, 37(4):1459–1480.

Powdthavee, N. (2010). *The Happiness Equation: The Surprising Economics of Our Most Valuable Asset*. Icon Books, London.

Proto, E. and Rustichini, A. (2015). Life satisfaction, income and personality. *Journal of Economic Psychology*, 48:17–32.

Putnam, R. (2000). *Bowling Alone: The Collapse and Revival of American Community*. Simon and Schuster.

Putnam, R. (2001). Social capital: Measurement and consequences. *Canadian Journal of Policy Research*, 2(1):41–51.

Putnam, R. D. (1993). The prosperous community. Social capital and public life. *The American Prospect*, 4(13):35–42.

Rablen, M. D. (2008). Relativity, rank and the utility of income. *The Economic Journal*, 118(528):801–821.

Rahn, W. M. and Transue, J. E. (1998). Social trust and value change: The decline of social capital in American youth, 1976–1995. *Political Psychology*, 19(3):545–565.

Ram, R. (2010). Social capital and happiness: Additional cross-country evidence. *Journal of Happiness Studies*, 11(4):409–418.

Ravazzini, L. and Chávez-Juárez, F. (forthcoming). Which inequality makes people dissatisfied with their lives? Evidence of the link between life satisfaction and inequalities. *Social Indicators Research*.

Rayo, L. and Becker, G. S. (2007). Habits, peers, and happiness: An evolutionary perspective. *The American Economic Review*, 97(2):487–491.

Rogers, S. H., Halstead, J. M., Gardner, K. H., and Carlson, C. H. (2011). Examining walkability and social capital as indicators of quality of life at the municipal and neighborhood scales. *Applied Research in Quality of Life*, 6(2):201–213.

Runciman, W. G. (1966). *Relative Deprivation and Social Justice: A Study of Attitudes to Social Inequality in Twentieth-century England*. University of California Press.

Russell, H. (2013). Work–family conflict and economic change. In Gallie, D., editor, *Economic Crisis, Quality of Work, and Social Integration: The European Experience*, chapter 7, pages 169–194. Oxford: Oxford University Press.

Russell, J. E. (2008). Promoting subjective well-being at work. *Journal of Career Assessment*, 16(1):117–131.

Ryan, L. and Dziurawiec, S. (2001). Materialism and its relationship to life satisfaction. *Social Indicators Research*, 55(2):185–197.

Sandvik, E., Diener, E., and Seidlitz, L. (1993). Subjective well-being: The convergence and stability of self-report and non-self-report measures. *Journal of Personality*, 61(3):317–342.

Sarracino, F. (2010). Social capital and subjective well-being trends: Comparing 11 western European countries. *The Journal of Socio-Economics*, 39(4):482–517.

Sarracino, F. (2012). Money, sociability and happiness: Are developed countries doomed to social erosion and unhappiness? *Social Indicators Research*, 109(2):135–188.

Sarracino, F. (2013). Determinants of subjective well-being in high and low income countries: Do happiness equations differ across countries? *The Journal of Socio-Economics*, 42:51–66.

Schafer, J. (1997). *Analysis of Incomplete Multivariate Data*. Chapman and Hall/CRC, CRC Press Company.

Schafer, J. (1999). Multiple imputation: a primer. *Statistical Methods in Medical Research*, 8:3–15.

Schlueter, T., Sievers, S., and Hartmann-Wendels, T. (2015). Bank funding stability, pricing strategies and the guidance of depositors. *Journal of Banking & Finance*, 51:43–61.

Schokkaert, E. (2007). Capabilities and satisfaction with life. *Journal of Human Development*, 8(3):415–430.

Schroeter, C., Anders, S., and Carlson, A. (2013). The economics of health and vitamin consumption. *Applied Economic Perspectives and Policy*, 35(1):125–149.

Seeman, T. E. (1996). Social ties and health: The benefits of social integration. *Annals of Epidemiology*, 6(5):442–451.

Sen, A. (1985). Well-being, agency and freedom: The Dewey lectures 1984. *The Journal of Philosophy*, 82(4):169–221.

Sen, A. (1993). Capability and well-being. In Nussbaum, M. and Sen, A., editors, *The Quality of Life*, pages 30–53. Oxford University Press.

Sen, A. (1999). *Development as Freedom*. New York, NY: Anchor Books.

Senik, C. (2004). When information dominates comparison: Learning from Russian subjective panel data. *Journal of Public Economics*, 88(9):2099–2123.

Senik, C. (2008). Ambition and jealousy: Income interactions in the 'Old' Europe versus the 'New' Europe and the United States. *Economica*, 75(299):495–513.

Sheldon, K. M., Sheldon, M. S., and Osbaldiston, R. (2000). Prosocial values and group assortation. *Human Nature*, 11(4):387–404.

Smelser, N. J., Baltes, P. B., and Berkman, L. (2001). Social Integration, Social Networks, and Health. In Smelser, N. J. and Baltes, P. B., editors, *International Encyclopedia of the Social & Behavioral Sciences*, pages 14327–14332. Elsevier.

Smith, C., Organ, D. W., and Near, J. P. (1983). Organizational citizenship behavior: Its nature and antecedents. *Journal of Applied Psychology*, 68(4):653–663.

Solnick, S. J. and Hemenway, D. (2005). Are positional concerns stronger in some domains than in others? *The American Economic Review*, 95(2):147–151.

Soto, C. J. and Luhmann, M. (2013). Who can buy happiness? Personality traits moderate the effects of stable income differences and income fluctuations on life satisfaction. *Social Psychological and Personality Science*, 4(1):46–53.

Spector, P. E. (1997). *Job satisfaction: Application, Assessment, Causes, and Consequences*. Series: Advanced Topics in Organizational Behavior, volume 3. Sage Publications.

Staw, B. M., Sutton, R. I., and Pelled, L. H. (1994). Employee positive emotion and favorable outcomes at the workplace. *Organization Science*, 5(1):51–71.

Stiglitz, J. E., Sen, A., and Fitoussi, J.-P. (2009). Report by the Commission on the Measurement of Economic Performance and Social Progress. *Paris: Commission on the Measurement of Economic Performance and Social Progress*.

Stutzer, A. (2004). The role of income aspirations in individual happiness. *Journal of Economic Behavior & Organization*, 54(1):89–109.

Stutzer, A. and Frey, B. S. (2006). Does marriage make people happy, or do happy people get married? *The Journal of Socio-Economics*, 35(2):326–347.

Stutzer, A. and Frey, B. S. (2008). Stress that doesn't pay: The commuting paradox. *The Scandinavian Journal of Economics*, 110(2):339–366.

Tiefenbach, T. and Holdgrün, P. S. (2015). Happiness through participation in neighborhood associations in Japan? The impact of loneliness and voluntariness. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 26(1):69–97.

Tiefenbach, T. and Kohlbacher, F. (2015). Disasters, donations, and tax law changes: Disentangling effects on subjective well-being by exploiting a natural experiment. *Journal of Economic Psychology*, 50:94–112.

Tsai, W., Chen, C., and Liu, H. (2007). Test of a model linking employee positive moods and task performance. *Journal of Applied Psychology*, 92(6):1570–1583.

Tsui, H. C. (2014). What affects happiness: Absolute income, relative income or expected income? *Journal of Policy Modeling*, 36(6):994–1007.

Uysal, S. D. and Pohlmeier, W. (2011). Unemployment duration and personality. *Journal of Economic Psychology*, 32(6):980–992.

Van den Berg, B. and Ferrer-i-Carbonell, A. (2007). The well-being of informal caregivers: A monetary valuation of informal care. *Health Economics*, 16:1227–1244.

Van Praag, B. and Baarsma, B. E. (2005). Using happiness surveys to value intangibles: The case of airport noise. *The Economic Journal*, 115(500):224–246.

Van Reekum, C. M., Urry, H. L., Johnstone, T., Thurow, M. E., Frye, C. J., Jackson, C. A., Schaefer, H. S., Alexander, A. L., and Davidson, R. J. (2007). Individual differences in amygdala and ventromedial prefrontal cortex activity are associated with evaluation speed and psychological well-being. *Journal of Cognitive Neuroscience*, 19(2):237–248.

Veblen, T. (1899). *Theory of the Leisure Class: An Economic Study in the Evolution of Institutions.* Macmillan, New York.

Verme, P. (2009). Happiness, freedom and control. *Journal of Economic Behavior & Organization*, 71(2):146–161.

Welsch, H. (2006). Environment and happiness: valuation of air pollution using life satisfaction data. *Ecological Economics*, 58(4):801–813.

Welsch, H. and Kühling, J. (2016). How has the crisis of 2008–09 affected subjective well-being? Evidence from 25 OECD countries. *Bulletin of Economic Research*, 68(1):34–54.

Whiteley, P. (2000). Economic growth and social capital. *Political Studies*, 48:443–466.

Williams, G. C., Frankel, R. M., Campbell, T. L., and Deci, E. L. (2000). Research on relationship-centered care and healthcare outcomes from the rochester biopsychosocial program: A self-determination theory integration. *Families, Systems, & Health*, 18(1):79–90.

Wilson, R. S., Krueger, K. R., Arnold, S. E., Schneider, J. A., Kelly, J. F., Barnes, L. L., Tang, Y., and Bennett, D. A. (2007). Loneliness and risk of alzheimer disease. *Archives of General Psychiatry*, 64(2):234–240.

Wright, T. A. and Bonett, D. G. (1997). The role of pleasantness and activation-based well-being in performance prediction. *Journal of Occupational Health Psychology*, 2(3):212–219.

Wright, T. A. and Cropanzano, R. (2000). Psychological well-being and job satisfaction as predictors of job performance. *Journal of Occupational Health Psychology*, 5(1):84–94.

Wright, T. A., Cropanzano, R., Denney, P. J., and Moline, G. L. (2002). When a happy worker is a productive worker: A preliminary examination of three models. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 34(3):146–150.

Zak, P. and Knack, S. (2001). Trust and growth. *The Economic Journal*, (111):295–321.

Zelenski, J. M., Murphy, S. A., and Jenkins, D. A. (2008). The happy-productive worker thesis revisited. *Journal of Happiness Studies*, 9(4):521–537.

Acknowledgments

A good friend of mine once asked me:
– Do we really need to make all this research to know what makes us happy? Or to understand that happiness is important?
I didn't reply as I knew that the answer was "No".
Then he said:
– Happiness is simple: it's about *work* and *love*.

[...]

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