ISSN - 2038-6931 – WORKING PAPER – 04/2012

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WORKING PAPER

WHAT ARE WE LEARNING FROM THE LIFE SATISFACTION LITERATURE?

What are we learning from the life satisfaction literature ?

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Abstract
The recent availability of cross-sectional and longitudinal survey data on life satisfaction in a large number of countries gives us the opportunity to verify empirically (and not just to assume) what matters for individuals and what economists and policymakers should take into account when trying to promote personal and societal wellbeing. The wide array of econometric findings available in this booming literature display evidence, generally robust to different cultural backgrounds, on the effects of some important happiness drivers (income, unemployment, marital status) which can be considered "quasi stylized facts" of happiness. If economic policies, for many obvious reasons, cannot maximize self declared life satisfaction as such, we are nonetheless learning a lot from these contributions. In particular, results on the relevance and the risk of crowding out of relational goods, on the revisited inflation/unemployment trade off and, more in general, on the measurement of the shadow value of non market goods obtained with life satisfaction estimates, are conveying relevant information about individual preferences and what is behind utility functions. Such findings suggest us to move beyond anthropological reductionism toward behavioral complexity and to refocus target indicators of economic policies in order to minimize the distance between economic development and human wellbeing.

Keywords: life satisfaction, shadow value of non market goods, unemployment/inflation trade-off.

1. Introduction

Even when happiness data were not available, the interest of economists, since the classics, extended beyond unemployment, output growth and stability to more general and philosophical questions on life satisfaction and its drivers.
In a famous and often quoted sentence Malthus (1798) said when commenting Adam Smith's Wealth of nations that: "*The professed object of Dr. Adam Smith's inquiry is the nature and the causes of the wealth of nations. There is another inquiry, however, perhaps still more interesting, which he occasionally mixes with it, I mean an inquiry into the causes which affect the happiness of nations*".
The value of the investigation on the wealth-happiness nexus was also recognised, among others, by Marshall (1890), Veblen (1899) and, more recently, Dusenberry (1949) and Hirsch (1976).

However, until more recent times, in absence of the ample and multi-country empirical databases we have now, the debate remained confined within the realm of philosophy and history of economic thought and the famous say of Einstein that "things that matter cannot be measured" could be well applied to the case. As in the famous joke about economists, evidence on the determinants of happiness and life satisfaction was in the shadow and out of the street light since the latter made possible to carry on empirical research only on a very limited range of issues for which theoretical hypotheses could be tested and such issues did not include determinants of happiness.

The shortcut generally adopted by economists, standard in mainstream economic textbooks and most theoretical models, was that the utility function and its arguments were an exhaustive, non testable, description of human desires and ambitions or at least of those related to the field of study of economics under the maintained assumption that desires and aspirations which were out the research scope where not affected or were not relevant to the analysis. This simplification introduced a dichotomy between the various parts of the same integrated human being who was assumed to behave according to different rules when *homo oeconomicus*, *homo politicus* or *homo domesticus* in primary relationships such as family or community ties, were in action.

In this perspective the progressive availability of information about individual life satisfaction from surveys[1] has stimulated researchers curiosity and progressively allowed to test the assumptions on which economic thinking was based.

When life satisfaction data became available, the first descriptive provocation challenging the tenet of the non divergence between economic growth and happiness was provided by the so called Easterlin's paradox (1974) with a simple descriptive statistics showing the non convergence between a steadily increasing per capita income and a stationary or slightly decreasing share of (self declared) "very happy" individuals in the post II world war period in the US.

The paradox stimulated the debate and the interest in the field and explains why the relationship between income and happiness is among the most debated issues in it. Beyond it, what is more surprising in happiness studies is the remarkable robustness of some basic results confirmed under different samples, estimation periods and cultural backgrounds: in spite of the same semantic heterogeneity of the concept of happiness,[2] of the different cultural backgrounds affecting the way individuals answer to these questions, we observe almost everywhere the same impact of income, health, wealth, unemployment and marital status.

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[1] Among these databases the most important having information covering a large number of countries and years are the World Value Survey, the World Poll of the Gallup organization; the Eurobarometer and the European Household Survey. On the other side, we have several panel databases available which contain longitudinal information on self declared happiness (British Household Survey Panel, German Socioeconomic Panel, and Russia Monitoring Survey) although they have it for a single country.

[2] The world happiness has nuances which vary according to different languages. In Anglo-Saxon languages is more akin to a concept in which happiness is fruit of chance (the English word happiness has its root in the verb "to happen" and *gluck* (happiness in German) is close in meaning to luck). The meaning is still different in French (*bonheur*) and Italian (*felicità*) where it is more akin to a concept of personal responsibility, cultivation of virtues and life flourishing (Bruni and Porta, 2005).

The goal of this synthetic survey on these studies is that of illustrating such findings and the methodological problems which arise in the field.

The paper is divided into six sections. In the second section we start from the Easterlin's paradox and investigate whether it is valid or not also in other countries and periods. Beyond it, by discussing the econometric evidence on the issue, we document that the relationship between happiness and life satisfaction is much more complex than what assumed by both the paradox an the textbook utility function. In essence, while evidence on the instantaneous nexus between income and happiness does not lead to reject the assumption of a concave relationship between utility and income, usually postulated in theoretical models, several factors complicate the picture in the medium run. Among them the most relevant are *hedonic adaptation* and *relative income* effects by which comparisons with oneself in the past and with others alter the short run satisfaction we derive from material achievements. In spite of it, when higher personal income is also a proxy of high domestic income and public wealth, and contribute to improve quality and availability of domestic public goods (especially health and education) we have a clear cut positive indirect impact of income on life satisfaction. Borrowing the well known concept of Sen (1999) income has straightforward and undoubtedly positive effects on life flourishing when it enhances individual capabilities which, in turn, depend on both personal prosperity, quality of institutions and public wealth.[3]

In the third section we discuss the relationship between happiness and sociability finding that the quality of social relationships is a crucial driver of life satisfaction. We also discuss the novel concept of relational goods and illustrate the coordination failures which have led to deplete progressively the stock of such goods in high income societies. The mechanism is similar to the well known Baumol's disease. Relational goods, like performing arts, do not get benefit from technological innovation as it occurs for most traditional goods since the time needed to produce them cannot be compressed. As a consequence their relative cost gets higher and higher and the opportunity cost of the time invested in relationships grows. Higher opportunity costs do not depend only by the fact that individuals are more productive but also by the competition of an increasingly wider range of non relational leisure (i.e. solo TV watching and internet navigation) activities with time invested in relational goods.

The rest of the third section looks at the relationship between life satisfaction and other important drivers such as education, marital status and children.

In section 4.1 we discuss some crucial methodological issues related to happiness studies. More specifically, we analyse the two alternative approaches (econometric estimates on the determinants of self declared life satisfaction *vis à vis* the momentary affect approach) and tackle issues such as the relationship between life satisfaction and utility, problems related to the cardinality/ordinality assumption and the heterogeneity of life satisfaction scales across individuals and across different cultural backgrounds.

[3] For the development of the concept of capabilities see Sen (1985a and 1985b). As it is well known capabilities are defined in Sen (1999) as "the alternative combinations of functionings that are feasible for a person to achieve" (p.75) and, in turn, functionings as "various things a person may value being or doing." (p.75).

In section 4.2 we document how life satisfaction evidence has been used to calculate the shadow value of non market goods, while in section 4.3 we discuss the specific literature which uses happiness scores to recalculate the unemployment-inflation trade-off.
Finally, in section 5 we discuss the consequences in terms of policy and policy indicators of what we learned from the life satisfaction literature. Without going to the opposite (and dangerous) extreme of using directly life satisfaction scores as wellbeing indicators, empirical results in this literature are very helpful to understand what is missed when relying solely on GDP indicators and how a more sophisticated evaluation of wellbeing can be drawn which takes into account complex interrelations between monetary and non monetary drivers of life satisfaction. Section six concludes.

2. The Easterlin's paradox and the relationship between income and happiness

The sections which follow will discuss whether the paradox is confirmed in different countries and periods and interpret it in the light of the complex relationship between income and happiness which include, together with standard economic effect, sociological (comparisons with peers) and psychological (hedonic adaptation) effects.

2.1 Is the paradox confirmed in other countries and periods ?

The symbolic importance of the Easterlin's paradox (even in the limit of its simple descriptive evidence) is that it confutes the maintained assumption of many economic analyses that, by pursuing economic growth, we are also increasing personal life satisfaction.
Even though the paradox illustrates per se an important phenomenon in the US post II World War period, several authors wondered whether the same result could be found in different countries and periods. With this respect we may resume findings of inquiries on this point by saying that: i) the paradox is confirmed in many other high income countries but ii) not in all of them; iii) in spite of the paradox the difference in average happiness levels in high and low income countries is generally positive and strong.[4]
More specifically, the paradox is confirmed by Blanchflower and Oswald (2004) showing that, in spite of a steadily increasing standard of living, in the period going from the early 1970s to the late 1990s, average self declared happiness remained constant or even declined not only in the United States but also in Great Britain, Belgium and Japan. Similar results are obtained by Veenhoven (1993) in Japan over the period 1958-1987 and Frey and Stutzer (2002b) on a large sample of countries using data from the World Database of Happiness and the U.S. Bureau of Census.

[4] An interesting exception is in the comparison between average happiness levels of Mexican and US citizens from the World Value Survey data with the former being on average slightly happier than the latter. A part from the methodological difficulties in comparing self declared life satisfaction among different cultures (see section 4) this finding is not inconsistent, as it may seem to be, with the flow of Mexicans moving to the US. Actually the "vote with feet" of unhappy Mexicans can be part of a sorting and matching process by which those Mexicans for which money matters more move to the US, thereby leaving in their countries citizens with are happier with a lower level of income.

By contrast, Diener and Oishi (2000) document the association between high real per-capita growth rates and (small) increases in self-reported happiness in countries like Denmark, Germany and Italy during the '60s and '70s. In the same direction Castriota (2006) observes that the paradox does not apply to Italy when using Eurobarometer data for last decade.
More recently, the paradox has been questioned by Stevenson and Wolfers (2008) documenting the positive and significant relationship between income and life satisfaction after controlling for many concurring factors. The authors devise a two stage approach. In the first stage they regress on time trends both life satisfaction and per capita income separately for each country having long time series for these two variables. In the second stage they look at the correlation between combinations of points generated by country pairs of trend coefficients for the two variables on the considered number of countries finding the above mentioned positive result. In a reply to them Easterlin and Angelescu (2009) show that, if country pairs of income and happiness trend slope coefficients have a minimum of 8 years (to ensure that what we are observing are long run effects), the paradox emerges again and income per capita is again not significant. Bartolini et al. (2010) show with the same approach that the regressor becomes highly positive and significant if we replace income per capita with a measure of social capital, (proxied by the only variable available for so long time periods, that is, the share of individuals having at least one membership in various country associations and organisations). The querelle demonstrates that the same data can be viewed from different angles leading to different conclusions even though the simple descriptive evidence of the paradox remains there and requires some interpretation. An attempt is provided in the next section

2.2 The interpretation of the paradox

It is important to clarify what the Easterlin's paradox says and what it does not say. The paradox does not establish per se a statistically significant (and negative) nexus between happiness and per capita income or a causality nexus between stagnation of happiness and per capita income growth. Neither it can exclude that a significant and positive relationship between income and happiness exists after controlling for all relevant variables excluded from the picture. Furthermore, it is an aggregate long run association between two variables which is far from verifying the effect of changes in income on (short run) changes in happiness at individual level (a question we will discuss below). What it however undoubtedly says is that per capita income is not a reliable synthetic proxy of life satisfaction in the countries in which the paradox holds, or that, economists and politicians may be misled if they believe that by increasing per capita income they also automatically raise life satisfaction of their citizens and electors.
As a consequence, even without more sophisticated investigation, the paradox suggests that a richer set of indicators has to be used in order to evaluate country wellbeing.
To go deeper into this point consider the comparison between US (where the paradox applies) and Italy (where the paradox does not apply).
In the US per capita income growth in the post world war II period is accompanied by a rising household debt (De Bonis et al. 2007) and increasing inequality (Wilkinson and Pickett,

2009). In the more "parsimonious" Italy saving rates and wealth to income ratios are higher[5] and debt to income ratio far lower than in the US. Health and education are free for large part of the population in Italy and a higher stake of pension rights is not affected by stock market volatility. Exactly as financial analysts do not look only at net sales in corporate accounts, but also at the dynamics of stocks such as debt and total assets, economic wellbeing of individuals does not depend only on per capita income but also on the level and volatility of their wealth, the cost of public goods and the level of debt.
If per capita income in the US has risen significantly in the post world war II period, the per capita flow of money available after paying debt interests, health insurance and education for a large share of the population may have not risen much. In addition to it higher income inequality may have reduced life satisfaction when comparing material achievements with the average ones of the peers (see section 2.4). This may explain why life satisfaction stagnated or even declined in the second period of the time interval under scrutiny.[6]
A conclusion from this evidence is that GDP is not a comprehensive indicator of life satisfaction since it is not even a comprehensive indicator of economic wellbeing.

Beyond the problem of the poverty of economic indicators there are many other potential explanations of the paradox different from the intuitive one that "money does not make happiness". This is all the more so if we consider that evidence from some high income countries and on the difference in happiness between high and low income countries is in contradiction with such simplistic interpretation. The descriptive evidence under scrutiny may tell us that: i) per capita income has diminishing returns on happiness; ii) different levels of inequality may explain why the paradox works in some high income countries and not in others; iiii) short term positive effects of income on happiness may disappear in the long run due to hedonic adaptation; iv) increases in per capita income crowds out other factors (such as relational goods) which are important drivers of life satisfaction. The last point arises because growth in per capita income raises the opportunity cost of investing in relational life (see section 3). Such problem cannot be solved by the individual with simple substitution/income effects since relational life is a local public good on which coordinated investment by all participants to the relationship is required. The consequence is the creation of coordination paradoxes and the decline or crowding out of relational life which is well documented for the US by Putnam (2000) and Bartolini et al. (2009)
In what follows we will go deeper in the other four potential explanations of the Easterlin paradox and this will serve us as a guide in the exploration of the happiness research.

[5] Brandolini et al. (2010) calculate a median net worth to disposable income ratio of 1 in 2001 in the US against a 4.8 value for Italy in 2002 based on domestic survey data.
[6] From a methodological point of view it must be rejected the objection that the unit measures of the two variables are far different and that the discrete qualitative measure of happiness has an upper bound. The point does not matter since, in the Easterlin's analysis we are far from that upper bound (the share of very happy people is around 20 percent of the population). The more general problems related to measuring life satisfaction and happiness (cardinality/ordinality of the measure, heterogeneity in life satisfaction scales across individual and countries) will be discussed in detail in section 4.

2.3 Happiness and income

The three characteristics of money (unit count, reserve of value and medium of exchange) led classical economists to formulate the hypothesis of nonsatiation and decreasing marginal utility[7] in the relationship between income and utility.
The hypothesis stems from the three above mentioned functions of money and, in particular, from the fact that it is a mean of exchange which can be used to purchase an ample variety of material or immaterial goods (some among the latter, such as visibility and social recognition, may be extremely expensive and are probably what financiers of popular sport teams buy when becoming owner of the club). Hence, its marginal utility should keep on being positive, even when individuals possess large amount of it.
Empirical analyses on the relationship between income and life satisfaction confirm that classical economists were right if we look at the instantaneous utility function for a single individual but not when we consider the impact of relative income and the change across time of the function due to hedonic adaptation. However concavity and nonsatiation fit quite well the cross-sectional distribution of per capita income and life satisfaction levels of world countries (see Frey and Stutzer 2002b). This implies that, at low per capita income levels, small improvements make a strong difference in terms of average country life satisfaction while, at high income levels, the same changes have negligible impact. Even though the comparison of happiness levels among different countries is subject to cultural biases and ethimological heterogeneity in the same definition of happiness across cultures, such a strong and expected regularity seem to indicate that the biases are not so relevant.

What is certain is that the positive (generally nonlinear) association between per capita income and life satisfaction exists and is robust (see, among others, Easterlin, 1995 and 2000; Frey and Stutzer, 2000; Di Tella, Mc Culloch and Oswald, 2000) as well as a relationship of the same sign between changes in income and changes in life satisfaction in panel data where researchers control for fixed effects, usually interpreted as time invariant inherited individual traits (see, among others, Winkelmann and Winkelmann, 1998; Ravallion and Lokshin, 2001; Ferrer-i-Carbonell and Frijters, 2004a; Senik, 2004; Ferrer-i-Carbonell, 2005 and Clark et al., 2006).
In this framework the most relevant findings are those of papers which go beyond the detection of the positive nexus and try to solve the causality problem by identifying exogenous changes in income such as tsunami related effects on income (Becchetti and Castriota, 2007), lottery wins (Gardner and Oswald, 2006b) or changes in real income in Russia and East Germany after transition and reunification (Frijters et al., 2004a, 2004b and 2006). All of them find a significant impact of these income shocks on life satisfaction.

Beyond these more general results it is however interesting to see that "money does not buy happiness" for a non negligible subset of individuals in high income countries which have

[7] The law of decreasing marginal utility was first formulated by Gossen (1854) and then adopted by the school of marginalist economists (Jevons, 1886 and Menger, 1971).

been defined as "frustrated achievers" (Graham and Pettinato, 2002). Frustrated achievers are individuals who experience nonpositive (or even negative) changes in life satisfaction in parallel to a positive change in real personal or equivalised household income. In an empirical analysis on GSOEP data (168,626 observations for the period 1984-2004) Becchetti and Rossetti (2009) find that around one third of individual-year changes indicate the presence of frustrated achievement. The main factors associated with it are contemporary deterioration of health or failure of personal relationships.

How to reconcile the robust nexus between income and happiness documented in this section with the Easterlin paradox ? Two are the main rationales. First, cross-sectional evidence on the positive nexus may simply illustrate a distributional effect by indicating that, within a given country, higher income is associated with higher life satisfaction and viceversa. Second, the positive nexus between first differences in income and life satisfaction is a short run effect which can, in principle, be reabsorbed in the long run (as it occurs in the lottery winners story of Gartner and Oswald) . This is not in contrast with the possibility that country growth does not generate significant increases in average life satisfaction.
To understand better these two points we discuss relative income and hedonic adaptation effects.

2.4 Relative income effects

As "social animals" in the Aristotelic sense human beings are deeply affected by comparisons with their peers. Our internal psychological mechanisms are such that we often use comparisons to praise or to stimulate ourselves. In order to do so, we tend to compare ourselves with a demanding reference group when we want to give us a push, while we compare with a less demanding reference group when we want to bolster our self esteem.
Based on these premises the relative income hypothesis argues that individuals do not look just at their own income but also compare it with the average income of their reference group. Competition with others may create "treadmill effects", up to the extreme case of fully relative preferences where only relative and not absolute income matters. In such context an increase in personal income, paralleled by an equal increase in income of all the reference group, would not affect individual life satisfaction. This is equivalent as saying that, with competition on income considered as a zero sum game, the dominance of the relative income effect may paradoxically eliminate any significant impact of a positive change in personal income (Dusenberry, 1949; Frank, 2005 and Layard, 2005).
Beyond this extreme proposition, we however generally observe that absolute and relative effects generally coexist. In addition to it, since more private creation of economic value normally translates into a higher tax inflow and more resources available for the provision of public goods, there is a channel through which an increase in absolute income generates positive effects on happiness even if relative positions are unchanged (especially if it affects health, education and the cost of public goods and services).
The significance of relative income in life satisfaction has been rigorously tested in econometric estimates (Dorn, Fischer, Kirchgassner and Sousa-Poza, 2007; Ferrer-i-Carbonell,

2005). From a methodological point of view the measurement of the relative income effect is not free of problems. First, the identification of the peers is not easy and different authors look at the robustness of the relative income to different reference groups which combine geographical location, gender, age cohorts and professional characteristics. Second, relative income is not uncorrelated with individual or household income and therefore collinearity problem may not help to measure accurately coefficient magnitudes.
The importance of relative income comparisons is confirmed by studies looking at the issue from a different perspective. In a recent experiment with thousands of observations from eight different countries, Corazzini et al. (2010) ask individuals to chose between a first case in which they are first in a group but have income which is lower than in a second case in which they are the last of the group. The experiment shows that the preference for being first, even with a lower income, is associated to male gender, higher education and residence in a high income country. On the other hand, higher income of peers is not so negative, not only in low income countries but also in emerging countries.

This last finding, if associated to those of Senik (2004) in transition countries, Jiang et al. (2009) in urban China and Becchetti and Savastano (2009) in Albania suggests that, for lower levels of income and high social mobility, a negative difference between one's own income and the income of peers may paradoxically translate into a positive and not negative effect on life satisfaction. The standard rationale which may explain this anomaly is the so called *tunnel effect hypothesis* (Hirschman, 1973): if an individual is stuck in a traffic jam and observes that, after a while, a car in the contiguous lane starts moving, he may be happy for it since this is a signal that he is soon also starting to move.
The important implication of these results is that higher social mobility raises the level of income inequality that individuals can tolerate or that "American dreams" have a fundamental social role in compensating dissatisfaction of the less wealthy in highly unequal societies.

Back to the main finding, the fact that individuals, especially in high income countries, may suffer if their reference group is better off suggests, more in general, that inequality may be harmful for happiness. This is exactly the point of a stimulating book of Wilkinson and Pickett (2009) showing, both across world countries and US states, an impressive correlation between domestic Gini coefficients and infant mortality, obesity, imprisonment, homicides, teenage births, mental illness and drug addiction. This evidence is purely descriptive and does not control for concurring factors or causality links (i.e. a country which is more open to immigrants may "import" higher levels of inequality and also higher levels of the above mentioned correlates due to lack of integration of new generations of immigrants). It is however an important stimulus for future research aiming at providing rationales for what observed in these data.

If most of the relative comparison literature refers to income it is interesting to see that relative values on variables different from income follow the same rules.
The analysis of the effect of peer comparisons on variables different from income shows that life satisfaction of obese individuals is significantly higher when also the partner is obese than

when he/she is not (Clark et al. 2009). An interesting follow up of this research is to see how much income and non income inequalities between partners explain separations or divorces. In another contribution (Clark, 2008) it is shown that unemployment comparisons are so important to produce effects which are opposite to what we should expect from a purely economically rational point of view. More specifically, standard economic thinking suggests that individuals living in high unemployment areas should be less happy than those living in low unemployment areas since for the former will suffer from "reservation army" effects in the Marxian sense and more competition in finding a new job. On the contrary, in a UK sample Clark (2008) finds that the result is opposite and may be interpreted in the sense that widespread unemployment condition of peers reduces the negative comparison effect and that this factor has a higher effect on life satisfaction than the relatively lower probability of finding a new job.

To conclude on this point it is very important to clarify that the consequent policy advice of results presented in this section is not the pursuit of full equality. What is said here is only that human beings generally suffer inequality and comparisons with peers when the latter overperform them on average on a given performance indicator. The reaction to this is most of times envy and is not always transformed into the positive energy of emulation or simply lack of sensitiveness to the unpleasant comparison. The definition of the optimal level of inequality for a given society must take into account results arising from the life satisfaction literature.

2.5 Hedonic adaptation

Hedonic adaptation is one of the most powerful mechanisms which can reconcile evidence on the concave instantaneous utility functions and the insignificance of the income effect of happiness in the long run documented by the Easterlin paradox and supported by Easterlin and Angelescu (2009) and Bartolini et al. (2010) results.
From an empirical point of view hedonic adaptation is calculated by testing whether the sum of current and lagged (personal or household) income coefficients in a life satisfaction regression are significantly different from zero. When the null hypothesis is not rejected we have evidence of full adaptation, that is, current (generally positive) and lagged (generally negative) income effects compensate each other. From a theoretical point of view this implies that the concave utility function assumption does hold in a given instant of time but not across time. Frey and Stutzer (2000) illustrate this concept by showing that, with a given increase in income, we move along the shape of the utility function in the current period (a positive and significant nonlinear effect), but, later on, the monetary achievement triggers a rise in expectations which causes a downshift of the instantaneous utility curve. If the dynamics is repeated in time, and we link the different observed combinations of income and utility at given time intervals, we may end up having a flatter or flat relationship which is

consistent with the Easterlin's paradox. This interpretation is not at odd with the empirical evidence showing that, for a given level of income, higher aspirations and expectations have a negative effect on SWB (Douthitt et al., 1992; Stutzer, 2004).

3. The other stylized facts of life satisfaction

The literature on life satisfaction has progressively extended its interest to factors different from income after the discovery of the importance of non monetary variables in explaining the same relationship between monetary factors and happiness. Here below we survey some of the most important developments.

3.1 Happiness and sociability

The time I invested in the rose made it unique to me
Antoine de Saint Exupery

To understand properly the relationship between happiness and sociability it is essential to introduce the concept of relational goods.
The economic literature has concentrated its analysis on production and consumption of private and public goods and has almost completely neglected a third important category: relational goods. Relational goods have often been confused with private goods even though they have completely different, sometimes opposite, characteristics.

Relational goods are *a specific kind of local public goods (requiring the joint participation of at least two individuals) for which investment, production and consumption coincide* (Gui, 2000; Ulhaner, 1989). Relational goods are, on a smaller scale, lived in family relationships, friendships and any kind of social or recreational organizations. They include companionship, emotional support, social approval, solidarity. These goods may also be produced in many kinds of social events (club or association meetings, live sport events, etc.). A general laughter during a comic movie, supporters' enthusiasm at the stadium when their team scores a goal and applauses at a theatre are examples of relational goods produced on this larger scale.[8] These features help to understand that the production process of these goods is the meeting - 'encounter' in Gui 2005's definition - with family and friends or with a wider net of partners.
In relational goods production, investment and consumption coincide since participating to a relationship is both an act of production (my presence contributes to the increase in the value of the good), investment (the time invested in the relationship makes it more valuable) and consumption (I enjoy it while producing it).

[8] A football match and a comic movie may be seen alone on TV but, in that case, the absence of other close co-participants will deprive the participant of the fruition of the above mentioned public goods incorporated in such events.

Relational goods are *local public goods* in the sense that nonexcludabilty and non rivalry are limited to participants.
Actually, they are a special kind of public goods since they should be more properly defined as *antirival* than non rival since their very same nature is based on interpersonal sharing of them. More to it, participation to their production and consumption generates a positive externality on partners and enhances the quality of the public good itself (to the extreme of mass social events where congestion can increase utility !). This is why nonrivalry and nonexcludability are not viewed by participants as negative elements preventing them from exploiting all private benefits of the good, but as positive elements which implement its value (my satisfaction is actually higher, or even uniquely possible in case of only two partners, when another is also participating and taking pleasure).

A crucial feature of relational goods is that they require sincerity or *genuineness* to be valuable (Bruni and Stanca, 2008). These two features cannot be acquired on the market[9] (without being transformed in something completely different), even though they can be generated as a by product of some instrumental activity.[10]
Bardsley and Sugden (2006) use the Adam Smith's Theory of Moral Sentiments concept of 'fellow-feelings', to describe the mental states produced during such non instrumental social interactions. Fellow feelings are, in turn, fuelled by emotional consent and a record of intense experiences lived together.
Given this definition, it appears clear that relational goods are a different way of including "others" in the utility function with respect to the well established relative income approach in happiness studies (Ferrer-i-Carbonell, 2005). [11]

Why do we stress the concept of relational goods and what has it to do with happiness (and with the Easterlin's puzzle) ? In essence the points are that: i) the importance of relationships has been always neglected in theoretical models and, as a consequence, in policy suggestions; ii) relational goods suffer from a sort of Baumol's disease which will be illustrated below and the fall of their production has important effects on individual happiness.

[9] This does not mean that they don't have a price and a shadow value to be estimated.
[10] This does not prevent the possibility that relational goods are bundled with other goods. When travel agents sell packaged holidays for affinity groups, they are in a sense also putting in the bundle the companionship of fellow-customers, while clubs the companionship of fellow members (Becchetti, Giachin and Pelloni, 2009a). In such case the non instrumentality of the companionship is preserved by the fact that the actual producers of the relational goods are not their sellers (even though it is not said that the bundling produces the best quality of relational goods).
[11] Different ways of considering others in the utility function have correspondences in alternative philosophical views on human relationships. Grossly simplifying, in the history of literature and philosophy we move from the extreme perspective of Camus, for which "hell is others", to that of a branch of philosophical thought which includes Mounier (1949), Levinas (1972) and Buber (2002) considering the human nature as intrinsically relational (or persons as "knots into which relationships are tied") and thereby arguing that human flourishing is impossible without a good relational life.

To understand it consider that, with extremely rare exceptions, relationships do not appear directly in the *homo oeconomicus* utility function. An objection to this point may be that others are nonetheless, even though indirectly, taken into account in consumer choices since they are incorporated into leisure or purchasing choices (i.e. strong relational preferences may increase the demand for large houses versus small lofts, or family cars versus single place cars, etc.). This way of considering relational goods has however several limits: i) it is possible to enjoy relational goods without purchasing anything (i.e. in a walk with a friend); ii) leisure is a general concept which incorporates many different activities which can be relational, pseudo-relational (second life in internet) or utterly non relational (hours spent alone on the TV); iii) relational goods may also be produced and consumed when relationships with colleagues are good and there is a favourable working atmosphere.
For all these reasons it is important to test empirically whether the standard restriction in the utility function for which relationships do not matter holds, that is, to evaluate whether the time spent for relational goods has significant effects on life satisfaction (Becchetti, Pelloni and Rossetti, 2008).
The neglect of relational goods does not only create problems when evaluating factors affecting individual life satisfaction but may also lead to important consequences in terms of trust and productivity. As we all know, situations like those of prisoner's dilemma, traveler's game and trust games illustrate important cases in which trust and cooperation increase social payoff. Given that a trustful atmosphere may depend not only on law but also on norms which are fostered by interpersonal relations (Putnam 2000)[12] relational goods are an important factor easing productive relationships and the production of public goods.

3.1.1 Relational goods, happiness estimates and the Baumol's relational disease

It would not be correct to argue that the above described conception of relational goods is completely excluded from standard happiness estimates. Marital status controls are in fact important proxies which measure, in some way, the accumulated stock of a specific kind of relational good (love affection) where we may imagine a given threshold of such stock which delimits success from failure in the provision of the relational good itself (or marriage and/or stable partnerships from separation or divorce).
What is however completely neglected in standard happiness estimates is the focus on the actual production of relational goods and, more specifically, of other types of relational goods.
If we carefully look at characteristics of relational goods we may understand why they can suffer from a Baumol's relational disease (Baumol and Bowen, 1965). In the classical Baumol's disease it is argued that the relative price of performing arts versus manufacturing activities has exploded in the last century. While once the time needed by an artisan to produce a watch was exactly the same as that to produce one hour of performing art, technological innovation, division of labour and mass production allow today to produce thousands of watches in the hour needed to produce an hour of performing art. This is why

[12] We notice however that the econometric techniques we use are unable to capture these more universal benefits of relational goods.

the relative price of performing art has exploded. Relational goods are similar to performing arts since they require an almost fixed amount of time invested to be produced. Exactly as for performing arts technological progress in other areas (but also the explosion of various forms of non relational or pseudo-relational leisure) has increased opportunity costs of the time dedicated to them. The additional complication is that the requirement of joint effort with partners needed to produce them creates coordination failure problems and does not allow a solution to the problem on individual basis.[13] The Baumol's disease of relational goods may help to explain the decline in participation to social activities observed, among others, by Putnam (2000) and Bartolini et al. (2009)

The Baumol's disease and the coordination failure arguments provide an interpretation of the paradox of overconsumption of goods satisfying extrinsic needs (material goods beside basic necessities) and underconsumption of goods satisfying intrinsic needs (relational goods among them) without departing from rationality by assuming that people tend to mispredict utility, through underestimation of adaptation, distorted memories of past experiences, materialistic beliefs fostered by institutions (e.g. marketing) (as in Frey et al. 2007).

Even though under different definitions and forms, this issue is at the center of the interpretation of differences in hours worked between US and Europa and the consequences of strategic relational complementarities in the enjoyment of leisure (Alesina et. al., 2005 and Burda et al., 2008). As it is well known, in the "US equilibrium", individuals work a lot, consume a lot, and have reduced time for communal activities. On the contrary, in the "European equilibrium", they work less and consume less, but enjoy more common leisure.

This difference might not depend from a difference in the tax system (Prescott, 2004) or in tastes (Blanchard, 2006). An alternative hypothesis is that history (e.g., the first oil shock) and institutions (labor-market regulations) have simply led otherwise identical Americans and Europeans to coordinate on different equilibria.[14] The relationship of these two equilibria with happiness is analyzed by Alesina et al. (2005) documenting that happiness is higher in countries with lower working hours. To this piece of evidence we may add that in the European countries we observe an upward-sloping trend in happiness and a downward sloping trend in hours worked against no trend in happiness and a upward sloping trend in hours worked in the US as shown by Wolfers and Stevenson (2008).

To sum up, the Baumol's relational disease and the coordination problem in production of relational goods provide an alternative path for explaining the Easterlin paradox. In affluent societies with high productive jobs and plenty of non relational leisure activities available the opportunity cost of time invested in relational life rises. This phenomenon reduces personal investment and creates coordination failures leading to a reduction of the relational goods

[13] See on this point, among others, Corneo (2005), Jenkins and Osberg (2003) and Antoci at al. (2005) reflecting in their models on consequences of the fact that individual's time use choices may be contingent on the time use choices of others.

[14] According to these authors one of the strongest pieces of evidence in favor of complementarities across either leisure or work is that an overwhelming share of the population both in Europe and the US takes its two days of leisure during Saturday and Sunday. There would be huge benefits from staggering work so that different people take different days off during the week: this could reduce commuting time and would allow capital to be spread over more workers: the fact that this is not done suggest that the costs in terms of forgone welfare due to less coordinated leisure would be sizable as well.

produced in equilibrium. Since such goods are important drivers of life satisfaction this phenomenon has important negative effects on wellbeing.

3.2 Happiness and children: the fertility puzzle

The relationship between life satisfaction and children is another interesting strand of happiness research which may provide relevant insights for policies by helping to calculate the effects of pro or anti fertility policies and identify both pecuniary and non pecuniary effects of children on life satisfaction.
Beyond its importance for fiscal policies the research on this field highlights a fertility puzzle which leads us to reflect about individual preferences, motivational complexity and what is effectively measured by self declared life satisfaction.
Most happiness papers use the number of children as a control without explicitly focusing on the econometric results on this variable. Evidence from this "indirect" literature[15] shows that, when using as regressor a measure of non equivalised household income in life satisfaction estimates, the number of children has often negative[16] or insignificant [17]effects. In a recent survey Dolan et al. (2008) show that the impact is more negative when economic and relational conditions are harsher such as in cases of single parents (Frey and Stutzer, 2000; Angeles, 2009), divorced mothers (Schoon et al., 2005), poor families (Alesina et al., 2004 for the US), children over 3 years (e.g. Shields and Price, 2005) or who are sick and require extra care (Marks et al., 2002).[18]

The other approach for measuring life satisfaction (momentary affect calculated with the daily reconstruction method)[19] finds similar results by showing that taking care of children is among the less satisfaction-enhancing activities (Kahneman et al., 2004).

In spite of it, Easterlin (2005) illustrates that people want to have children and their desires do not change much during their life cycle (around 70 percent of people want at least one child and the average desired number of children is around 2). An even stronger conclusion provided by the author is that aspirations about children are not affected by hedonic adaptation, that is, do not adjust to the level of achievement as it is usually the case for material ends.

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[15] For indirect literature we mean empirical analyses focused on the impact of other factors which use the number of children as control variable. The direct literature concerns analyses focused exactly on the impact of the number of children on happiness. Evidence on both sides has pros and cons. The advantage of "indirect" literature is that it provides an unintended result on something which is not the focus of the paper. The disadvantage is that in the indirect literature there may not be specific effort of the researchers in going beyond the first regression findings to check the robustness of results on the variable which is not of specific interest of the paper.

[16]Frey and Stutzer (2000), Alesina et al. (2004), Di Tella et al. (2003) and Smith (2003) documenting that children have stronger negative effect in UK and the US than in Europe or Russia.

[17] Haller and Hadler (2006) in the WVS; Van Praag, Frijters and Ferrer-i-Carbonell (2003) in a 1992-1997 GSOEP estimate on West and East German workers.

[18] Needless to say we are talking about an aggregate average effect. Subsample splits, interactions with slope dummies and quantile regressions can articulate in more detail the relationship between the two variables.

[19] For a methodological discussion of the momentary affect approach see section 4.

Since it is difficult to believe that child births can be explained on aggregate by a problem of lack of self-control, we must wonder *why people desire (or do not prevent) something that is going to have negative effects on their life satisfaction*.

To answer this question it is possible to identify at least five potential explanations.

First, we may be induced to think that the negative effect vanishes once we eliminate from the estimate respondents living in the "harsher conditions" described above by Dolan (2008). Robustness checks on the German Socioeconomic Panel however show that the effect does not disappear when single mothers are eliminated from the sample (Becchetti et al., 2009)

A second explanation may be related to life cycle effects. On this point the variability of parental wellbeing reaction to children across life is demonstrated by Clark et al. (2008) documenting how first child births have a positive impact around the event date which however lasts only one year. Another life cycle effect is shown by Stanca (2009) and Becchetti et al., (2010) observing that, in a broader time horizon and with cross-sectional estimates on a large number of countries, the effect of children becomes positive and significant for individuals above a given age threshold. The picture which can be drawn from these results is quite realistic. Waiting the first child is a life satisfaction enhancing event but the difficulties of living with her/him after birth compensate such effect. While children are at home the effect gets negative and becomes again positive when parents are old and can rely on their offspring both on a relational and on an economic effect.

The puzzle however remains. When people decide to have children they may be rational only if the present discounted effect of current and future life satisfaction states generated by this decision is positive, while what we measure is a negative effect. To explain that, we may assume that life satisfaction declarations are biased toward the closer past events, while actual individual decisions are taken on different grounds or under the standard approach of utility under rational expectations, that is, the present discounted value of current and future expected life satisfaction with fully rational and forward looking capacity to evaluate it. In such case we should admit that self declared life satisfaction is more backward looking and does not measure utility of forward looking rational individuals, perfectly anticipating what is going to happen in the future.

A third explanation which also departs from the perfect information assumption is that individuals mainly look at the relational effect of having children and underestimate the economic effect on their income and the nonpecuniary costs of rearing them.

The paradox can also be solved by the assumption of motivational complexity. By considering the Sen (1977) argument on the fact that individuals are not just moved by self-interest, but also by sympathy and commitment, we might consider that the decision to have children falls into those duties which most people feel they have to comply with. Even if it cannot explain all the fertility decisions, this hypothesis is not rejected by empirical evidence. Individuals attending religious services have significantly more children even though they do not experiment a different impact of children on life satisfaction than those not attending.

In the introduction we mentioned that the relationship between happiness and children is another field where happiness studies may provide relevant policy insights. Trying to explain this paradox the analysis of the effects of children on life satisfaction may

help to estimate the shadow value of the gross (pecuniary plus non pecuniary) effect of having them. This can be done by replacing the household income with the equivalised income using proper (demand based[20] or stated utility level[21]) equivalence scales. In this case the pecuniary effect of children (the reduction of the income available for any single member of the household) may be separated by the non pecuniary (i.e. relational) one captured by the number of children variable.

In such case the shadow value of both the aggregate and the two decomposed effects may be interesting for policies. The aggregate effect may help to calculate the subsidy (tax) needed to stimulate (reduce) fertility. The net non pecuniary component may help to calculate the non pecuniary (relational) cost of the divorced parent who is not living anymore with their children. Results on German GSOEP data at individual level recorded for more than 20 years show that the negative effect of having children is relatively stronger for women, East Germans and individuals above median income in both East and West Germany (Becchetti et al., 2010).

To sum up, several rationales may help us to explain the children puzzle (decision of having children in spite of their average negative effect on life satisfaction). Some of them imply departures from selfishness and rationality (lack of self control, moral commitment), while some others question our capacity of calculating correctly consequences of our choices (underestimation of the economic and child bearing consequences of fertility decisions). The negative average effect may however hide strong variability of the impact across gender and income levels. The inability to understand how much these different rationales matter poses serious limits on the effect of policy measures and on the potential success of monetary incentives aimed at affecting fertility decisions.

A final interesting point is that, if we relate happiness results with the well known ones of the development literature on women education, we may convene that they are two extremes of the same phenomenon (Becker et al., 1990). On the one side, the increase in female education (and the consequent increase in their opportunity cost of having children) has been one of the most effective measures reducing explosive demographic trends (and promoting economic growth) in developing countries. On the other side, life satisfaction evidence tells us that subsidies to women can compensate too high opportunity costs which bring fertility below the replacement rate in developed countries.

3.3 Education and happiness

Following Castriota (2009) we identify at least eight reasons why education should have a direct positive effect on life satisfaction: i) a minimum level of capabilities is required to appear in public without shame; ii) knowledge is like a standard good which provides direct

[20] The first *demand based* approach makes use of so-called expert scales, where given weights are assigned to different household members and is the approach commonly used in income inequality analyses.

[21] For details of this approach which calculates scale elasticity using income satisfaction estimates see Schwarze (2003).

utility *per se* increasing the set of available functionings and capabilities. Furthermore, education iii) is a useful instrument to signal one's own skills in a framework of asymmetric information between the worker and the potential employer; iv) fosters labor market participation, employability and job protection and v) is positively correlated with productivity and earnings (see Becker, 1994); (vi) is related with job satisfaction since the educational attainment helps getting more interesting jobs and increase the probability of career advancement (Blanchflower and Oswald, 1994), vii) enhances autonomy and independence on the job and participation in relevant decisions (Albert and Davia, 2005); viii) affects positively health, given that more educated people are supposed to have less unhealthy habits given their higher capacity of exploiting new information about healthy lifestyles.[22]

This list of benefits clearly shows that when evaluating the impact of education on happiness what needs to be carefully evaluated is a complex pattern of direct and indirect effects. More specifically, only the first two items generate a positive direct effect on life satisfaction, whereas items from iii) to vii) illustrate indirect paths for a positive effect through reduced probability of unemployment and increased wage and non wage job satisfaction. The indirect pecuniary job satisfaction channel finds strong support at micro (return to schooling literature)[23] and macro (the role of education and human capital in conditional convergence) level. Finally, a crucial positive indirect effect is through health which is one of the most important variables determining life satisfaction.

These positive effects are however counteracted by the impact of education on aspiration levels since, everything else being equal, an increase in aspirations may reduce life satisfaction. An anecdotal example may be given by looking at how the range of job positions desirable by students changes according to their education record. Jobs which are desired with lower education levels become undesirable with higher education levels. If there is much shortage and competition for higher quality than lower quality jobs the gap between aspirations and achievements may increase with education.

The combination of these factors leads to a non necessarily positive and significant *direct* effect of education, net of other concurring factors.[24] The point is well resumed by Frey and Stutzer (2002b, p. 59) claiming that "*the level of education, as such, bears little relationship to happiness. Education is highly correlated with income ... Education may indirectly contribute to happiness by allowing a better adaptation to changing environments. But it also tends to raise*

[22] Hayward et al (2005) document that "Educational attainment is positively associated both with health status and with healthy lifestyles. For example, in the 1996-97 [Canadian] National Population Health Survey, only 19% of respondents with less than high school education rated their health as 'excellent', compared with almost 30% of university graduates. Self-rated health, in turn, has been shown to be a reliable predictor of health problems, health-care utilization, and longevity. From a health determinant perspective, education is clearly a good investment that can reduce long-term health care costs" (pp.37-38).

[23] For a survey on this literature see Card (1999).

[24] For positive and significant results see Di Tella, MacCulloch and Oswald (2001) on Eurobarometer data, Becchetti Castriota and Londoño (2006) on World Value Survey data, Albert and Davia (2005) on the European Community Household Panel and Hayo and Seifert (2003) for Eastern European countries between 1991 and 1995. Fore negative and significant results see Clark and Oswald (1996)

aspiration levels. It has, for instance, been found that the highly educated are more distressed than the less well educated when they are hit by unemployment (Clark and Oswald, 1994)".
If the effect of education on mean happiness is not always clear cut that on the distribution is more clear cut since higher shares of highly educated individuals significantly reduce happiness inequality (Becchetti, Massari and Naticchioni, 2010) by affecting both tails of the happiness distribution.
On the one side, the above mentioned effect on aspirations affects the right tail.On the other side, education reduces the left tail by widening the set of functionings and capabilities. Since functionings are "various things a person may value being or doing" (Sen, 1999, p.75), the nexus between the increase of functionings and the enhancement of capabilities is not unreasonable. Furthermore, since an important part of happiness inequality is explained by fat low tails (higher share of individuals with very low life satisfaction scores), higher education, by enlarging the set of functionings and capabilities, reduces the likelihood that individuals are devoid of sufficient resources to escape the low satisfaction trap. Such resources may be, following what observed at the beginning of this section, the increased possibility of finding satisfactory and well remunerated jobs, of taking care of one's own health and the additional opportunities that educated people have to enjoy leisure by appreciating a wider variety of cultural products.

3.4 Religion and happiness

Another quasi-stylised fact in happiness research is given by the positive and significant effect of religious practice (but not religious education per se) in most econometric studies. If we consider the role of religion, without entering into any discussion about faith, we may observe that it possesses at least two elements which, in the light of empirical results from life satisfaction studies, seem to be devised exactly to affect positively life satisfaction. First, several studies in economics and psychology show that individuals tend to adapt quickly to positive events while effects of negative shocks tend to persist (Costa et al. 1987; Cummins et al., 2004). By training believers' gratitude and providing a rationale for negative aspects of life religion aims at increasing (reducing) persistence of positive (negative) shocks. Second, while research on relative income (and, more generally, on other peer comparisons) shows that we suffer from comparisons with better-off peers (see section 2.4) and our competitive socioeconomic context tends to exasperate such differences by praising the winners, religion compensates these potential negative effects on individual wellbeing of the non top rank majority of people by advocating equal dignity of all individuals and by proposing a reverted ranking (poor and humble are preferred to the mighty and rich).
In addition to it, religious participation obviously creates a (vertical and horizontal) relational good for believers stimulating common consent and fellow feelings of participants especially when believers' community ties are stronger.
These happiness enhancing factors must compensate potentially negative ones (when religion is lived as a constraint on individual freedom or as a source of sacrifices or when more psychologically problematic people may self select as religious believers) to produce the

observed positive and significant effects on life satisfaction (Lelkes, 2006; Clark and Lelkes, 2009).

3.5 Marital status

The positive and significant relationship between marital status and happiness is a result emerging from the large majority of happiness empirical papers where marital status variables are always included as standard controls. Actually marital status controls are generally considered as both states (married, divorced, separated, widowed, cohabiting, single) and changes of states (marriage, divorce, separation).
As for many other happiness drivers it is interesting to look at both the "indirect" and the "direct" literature.
The indirect literature presents in most cases a positive and significant effect of the married and a negative and significant effect of separated or divorced status (Di Tella, Mc Culloch and Oswald (2003) in the US and Europe; Blanchflower and Oswald (2004) in the UK; Frijters and Beatton (2008) in Germany; Frey and Stutzer (2002a) in Switzerland and Graham and Pettinato (2002) in Latin America and Russia). The negative effect of the divorced status is generally weaker, consistently with the set point theory assumption that shocks tend generally to be reabsorbed over time (Costa et al. 1987; Cummins et al., 2004). Blanchflower and Oswald (2004) calculate that the shadow value of a lasting marriage is, on average, worth $100,000 per year.[25]
The marriage result is remarkable if we think that it must necessarily be an average of successful and unsuccessful (but not leading to separation) marriages. Again here the causality nexus is difficult to ascertain. If marriage may make people happier, it may nonetheless be the case that individuals with more prosocial personality traits and more optimistic attitude toward life are more likely to find themselves in stable marriages.
In this respect the analysis of the impact of changes in marital status is interesting and important helping us to disentangle direct from reverse causality effect.
From this point of view a paper from Clark, Diener, Georgellis and Lucas (2008) documents a "hill effect" around the marriage events with happiness increasing up to the event and declining after it.
To avoid endogeneity the authors control for pre-marriage levels of happiness. They find some evidence of self selection but also of a positive and significant effect of marriage on life satisfaction. Waite et al. (2002) also look at dynamic effects around the event and observe that adaptation to marriage is partial but not complete so that the latter generates permanent effects on welfare.
The more recent literature goes more in depth by exploring factors which may determine satisfaction or lack of satisfaction in marriage. and Frey and Stutzer (2006) observe that division of labour is important for spouses' well-being and especially so for women when

[25] A discussion on the use of happiness regression in calculating shadow values of non market goods is provided in section 4.3.

there are young children to raise. In addition to it, above median differences in partners' education level have a negative effect on experienced life satisfaction compared to those of couples with small differences.

4.Critiques and methodology of happiness research: can we rely on life satisfaction survey data ?

Are results presented above reliable and how much they can be affected by measurement problems ?
A first general critique to the empirical studies on the determinants of happiness is that the realm of economic research should be limited to what is observable and, consequently, individual satisfaction should be solely inferred by economic agents' saving, investment and consumption choices (for a survey of this arguments see Frey and Stutzer, 2002). The typical reply to this critique is that the same bundle of consumption goods, or the same measurable level of material well-being, may hide completely different levels of satisfaction according to heterogeneous intrinsic and extrinsic motivations and different courses of action leading to the same material outcome.[26] This argument may be resumed by arguing that *experience utility* is at least as relevant as *choice utility*. In this sense the empirical research on the determinants of happiness overcomes the "instrumentalist" assumption that selected strategies and experience lived during the course of actions have no effects on individual happiness beyond the realized outcome. [27]

4.1 How to measure happiness: life satisfaction and momentary approach

As it may be easily imagined the empirical studies on life satisfaction pose a series of methodological problems which cannot be easily solved. First of all, how happiness should be measured ? From this point of view the literature is divided into two strands. According to a first (largely followed by economists) life satisfaction is intended as an overall evaluation of one's own life, everything considered, without particular reference to the most recent events. The typical question consistent with this view and contained in large databases such as the GSOEP and the BHPS is "How satisfied are you with your life, all things considered ?" with response is given on the basis of a 0-10 or 0-7 Likert scale.

[26] A first paradox we meet into in this field is that economists tend to believe that goals achieved with the minimum effort are those giving the highest level of utility while in many cases it may be exactly the opposite since effort gives flavor to what has been conquered.
[27] On this point it worth mentioning Frey and Stuzter (2002a) reporting Sen's (1986) sentence on the fact that \ *the popularity of the positivistic view is due to a mixture of an obsessive concern with observability and a peculiar belief that choice...is the only human aspect that can be observed*" and providing several examples of nonobjectivist analyses such as theoretical studies on emotions (Elster, 1998), self signaling, goal completion mastery and meaning (Lowenstein, 1999) and status (Frank, 1985).

In spite of these intentions the literature shows that most recent events are shown to have extra weight in life satisfaction answers (Kahneman, Fredrickson, Schreiber & Redelmeier, 1993; Redelmeier & Kahneman, 1996). An example of it is provided by Schwarz (1987) who divides his experimental sample into two groups and asks to all participants to do a photocopy of the questionnaire. A (treatment) group of participants find in the photocopy a dime while the (control) group doesn't. The author documents that ex post the treatment group declares higher levels of life satisfaction. In the same direction Schwarz and Clore (1983) demonstrate that atmospheric conditions are another factor close to the time of the question which people tend to overweight in their life satisfaction evaluation.

The above mentioned factors add noise to life satisfaction as a measure of true experienced utility. The consequence is that the signal-to-noise ratio has to be sufficiently high to make empirical research productive (Di Tella andMacCulloch, 2006). In general the disturbing influence of more recent events should not produce effects if we assume that shocks close to the interview time are randomly distributed with zero mean, an assumption which is all the more reasonable in large samples. Furthermore, it has been shown that the effect of atmospheric conditions which can affect more systematically a large number of respondents interviewed in short intervals of time, can be significantly reduced by introducing a specific question on weather conditions in the questionnaire.

The second approach for measuring happiness (momentary affect) has been mostly devised by the nobel price Daniel Kanheman[28]. In such approach (generally applied with the daily reconstruction method) respondents are asked to record the main events occurring during their day registering in parallel their state of satisfaction during each of them.

Even though happiness and pleasure are two different things (a masochist is happy even in pain or a stoic is happy even in sacrifice) the momentary affect, by reducing the distance between the event to be evaluated and the evaluation, reduces also the distance between the two concepts and bring happiness studies closer to an hedonistic perspective. This is not the case of the first life satisfaction approach where individuals may declare themselves satisfied about their life even though in it there have been hardship, sacrifices and moments of pain or sorrow.[29]

Note as well that the first approach in measuring happiness, by containing information on respondents' global evaluation of their life, reduces the possibility of interpreting life satisfaction scores as a mere a subutility function, as Kimball and Willis (2006) conjecture for measures of current affect. The parallelism between life satisfaction measures and utility functions commonly adopted in the economic models still presents some problems. Do individuals express lifetime utility or flow-utility related to specific and more recent events when declaring their life satisfaction levels ? Some of the findings commented in the section (3.2) looking at children and happiness seems to suggest that the second possibility cannot be ruled out.

[28] For an overview see Kahneman and Kreueger (2006).

[29] A useful distinction akin to the two approaches is made by Kahneman and Krueger (2006 , p.5) with the two concepts of *experienced utility* and *remembered utility*, that is, between "the way people feel about experiences in real-time and the way they remember their experiences after they are over".

4.2 Cardinality, ordinality and cultural bias

A second main methodological problem in the life satisfaction literature is related to the use of cardinality. As we all know the standard economic theory moved from cardinality to ordinality by establishing that it is possible to express one's own preference among bundles of goods (under the assumption of completeness, reflexivity, monotonicity and transitivity) while it is not possible to make comparisons among two different levels of happiness. By considering the GSOEP measure of happiness (0-10 integer values), even if we are not asked to say that a level of 4 expresses an "amount" of happiness which is twice as much as the level of 2, we still need to assume homogeneity of life satisfaction scales across individuals.
This problem should prevent us from making interpersonal comparisons using self-reported measures at the individual level (Harsanyi,1955). Consider however that the valuation of public goods only requires inter-group comparisons or that the life satisfaction evaluations are comparable across groups of individuals under different circumstances. The interpersonal comparability problem is reduced by the focus on groups since we do have usually no a priori reason to assume that a large group of respondents should be scoring themselves systematically differently in a way that interferes with estimating the coefficients of interest (Di Tella and McCulloch, 2006).
Again, on this point Cantril (1965) observes that individual evaluations on the 0-10 scales are quite comparable and Clark et al. (2008) argue that in other professions, such as medicine, cardinality is implicitly accepted and considered reliable when, for instance, a doctor asks to his patient how much a given touched part of the body hurts (and bases on an implicit comparison with other patients' declarations his evaluation of the intensity of the pain).

The problem is further complicated by the presence of cultural differences when comparing responses of individuals from different countries. In this case we first have a semantic issue since the same world of happiness does not have the same meaning in different languages (see footnote 2). In addition to it, cultural habits may generate significant country biases (it may be considered polite and correct in a given culture to declare oneself always satisfied while, in another one, people may tend to overcomplain).
More recently, a very interesting approach to solve this issue has been that which uses vignettes describing situations of happiness or sorrow and ask to people to attribute an happiness level to individuals in the vignette. This approach has been used to test for heterogeneity in life satisfaction scales and to evaluate its effect on standard happiness regressions. In one of the most recent papers Beegle et al. (2009) perform an experiment of this type on a large sample and show that respondents hold diverse scales when assessing their wellbeing. Nonetheless, they find little bias in the identification of significant determinants of life satisfaction. These findings are important since they give a firmer foundation to survey methods and life satisfaction regressions.
Needless to say, these problems make a fixed effect panel estimate (where basically what we measure are within effect for each individual) more reliable than cross-sectional country comparisons which are unfortunately the aspects which however attract most of the curiosity of the general public and of the press.

In spite of all these methodological problems Alesina et al. (2004) remind us that there are a series of arguments in favour of the reliability of life satisfaction studies.
The most relevant are that: (i) the long tradition of happiness studies in psychology and sociology which documents that the latter have survived a cultural "Darwinian selection" in these disciplines (Alesina, Di Tella and MacCulloch, 2004); (ii) the health related literature findings documenting significant and positive links between self-declared happiness levels and healthy physical reactions such as smiling attitudes (Pavot et al., 1991 and Eckman et al., 1990) and heart rate and blood pressure responses to stress (Shedler, Mayman and Manis, 1993); (iii) the capacity of wellbeing levels of being reliable predictors of future respondents' behaviour (i.e. individuals choose to discontinue activities associated with (Frijters, 2000 and Shiv and Huber, 2000)); (v) the close correspondence between respondents' self-declared happiness and the evaluation of the same respondents provided by friends and family members (see Sandvik et al., 1993 and Diener and Lucas, 1999). (vi) the significant nexus between positive feelings and physical measures of brain activity (higher alpha power in the left parefrontal cortex) identified in neuroscience studies when, at the same time, measures of hedonic well being, such as self-declared life satisfaction, have been shown to be related to the same brain activity (Clark et al., 2006).
This last argument deserves further consideration since it shows how neuroscience studies may create a third independent type of empirical measures which may reinforce consistency checks on the two traditional ones. In essence, individual may express themselves with revealed choices, with declarations collected in survey data and with physiological states which can now be tracked with brain images. All of these measures have limits when taken individually: the value of non market goods and experienced utility cannot be measured with revealed choices, survey answers are riddled with interview biases (see section 4.5) while brain images are not free from observational equivalence and statistical approximations (what is the blood flow threshold which delimits significant from not significant brain activity ?). As a consequence, consistency checks using at least two of these approaches may reinforce the validity of empirical findings.

4.3 Happiness and causality

It is not success that make people happy but happiness that makes people successful
Alfred Schweitzer

The problem of biunivocal causality and endogeneity is particularly severe in happiness studies. Beyond age (but not longevity), there are plausible assumptions for justifying theoretically both direct and reverse causality links for almost all other factors correlated with life satisfaction.
To make just an example the usually observed positive relationship between marriage and life satisfaction may depend from the positive effect generated by the marital status on life satisfaction or may otherwise imply that individuals with more pro-social inherited traits and a more positive view of life have higher probability to find a stable partner. In the same way,

the significant relationship between money and happiness may also be determined by common unobserved individual traits (assertiveness, optimism, hope in the future) which positively affect both life satisfaction and professional success in life leading to higher income.

Controlling for fixed effects is however not sufficient to capture reverse causality. Fixed effects proxy time invariant idiosyncratic personal characteristics but cannot capture endogeneity between changes of the regressor and the dependent variable, that is, situations in which variation in happiness within individuals across time affect potential happiness determinants and not viceversa. This is for instance the typical case of relational goods (section 3.1). Our basic mood may vary across life periods and such variation is highly likely to be associated to a different propensity to meet friends and to participate to social activities.

The identification of the correct causality nexus is a fundamental question when we want to draw policy conclusions from the observed empirical findings. More specifically, as it is well known, policy measures aimed at affecting a given happiness driver may be effective only in case of direct causality link. The point is underlined also by Clark et al. (2006) recommending caution in drawing policy recommendations from studies on happiness and unemployment, since the part of the measured effect which is expression of an inverse causality nexus (individuals with lower life satisfaction, or prone to pessimism, have relatively higher difficulties in finding a job), can hardly be tackled by active labour policies.

To apply this reasoning to the relational goods example as a politician I may increase wellbeing with policies which make it easier the creation of relational goods if a higher frequency, intensity or quality of the latter affect life satisfaction but my strategy will be totally ineffective if only the reverse link exists or an exogenous dynamics of people mood (which the politician cannot affect) univocally determines the fruition and enjoyment of relational goods. [30]

As in other economic subfields, causality problems may be solved by randomized field, laboratory or quasi-natural experiments. Lab experiments have the advantage of reproducibility[31] and capacity to isolate, ceteris paribus and with a specific treatment, the change of the variable whose impact on our target indicator we want to test. Their main limit is the reduced external consistency, or the lack of perfect correspondence between the artificial events produced in the laboratory and what happens in the reality of economic life. Since most lab experiments are run on the population of students with limited monetary incentives and the possibility of creating experiments with repeated action is limited by costs, experimental researchers have generally no guarantee that the observed behaviour would correspond to that of the actual population in real life choices where the experimental situation under scrutiny is continuously repeated in time.

This is why what is generally preferred is a situation not determined by an "artificial shock" created in the laboratory but by an exogenous shock generated by an historic event. In such

[30] The extreme generalized case in which policies are completely useless is that of the *set point theory* (Costa et al., 1987; Cummins et al., 2004) which states that any positive change in income (as of any other event in life) has no permanent effects on happiness, the latter being uniquely determined by individual temperament.

[31] Reproducibility is important since it allows to overcome another potential problem of experiments, that is, whether their results can be generalized or not when the same experimental protocol is applied to different samples in different countries.

case the exogeneity of the shock should eliminate the suspicion of reverse causality, so that the relationship between the exogenous variation and that of the target variable can be interpreted univocally.

Few interesting natural experiments in happiness studies have been performed to verify the causal nexus between money and happiness. From this point of view, as briefly mentioned before, Gardner and Oswald (2006) look at lottery wins, Frijters et al. (2004a, 2004b and 2006) consider aggregate changes in real income after transition or reunification in Russia and Germany respectively, while Becchetti and Castriota (2010) look at the effect of the Tsunami as a "negative lottery" by comparing changes in income and in life satisfaction for individuals hit by the calamity and those living at few kilometres from them who were not directly affected by the natural catastrophe.

Consider that in second and third example of studies, differently from the first, a distinctive advantage is in the absence of voluntary participation bias (that is, individuals who were hit by the shock did not made any voluntary choice which affected their probability of living such event since they did not buy any lottery ticket).

The more traditional alternative to experiments is given by the identification of *relevant* and *valid* instruments, that is, of instruments which are significantly correlated with the endogenous instrumented variable but are such that there is no correlation between them and the error term of the structural regression (which, in turn, implies no direct causation from the instrument to the dependent variable and absence of omitted factors affecting both). It is not easy to find instruments having the two properties (relevance and validity) together given the trade-off between them.

An example of the instrumental approach applied to life satisfaction studies may be retrieved in Becchetti, Giachin and Pelloni (2009) who use the share of retired people in a given gender specific age cohort as an instrument for relational goods. Such variable, indicates a higher availability of peers with more leisure time available and proves to be relevant and correlated with the instrumented variable. The instrument is also valid since it is shown not to affect, per se the dependent variable and not suspect of reverse causation.

A final interesting alternative approach is the discontinuity design.[32] Such methodology can be implemented when the beneficiaries/non-beneficiaries of a treatment can be ordered along a quantifiable dimension and the latter can be used to compute a well-defined index or parameter. The crucial point is that the index/parameter must have a cut-off point for eligibility and must be what decides the assignment of a potential beneficiary to the treatment (or to non-treatment).

The main intuition of this approach is that, around the cut-off point, treatment and control sample individuals must be very similar to each other. Discontinuity designs may be sharp or fuzzy. They are sharp when a unique cut off univocally divides treatment from control sample. They are fuzzy when the discontinuity may be correlated with the treatment and the cut off is not univocal.

[32] For a theoretical treatment see van der Klaauw et al. (2001). For other prominent examples of this approach, see, among others, Angrist and Levy (1999), van der Klaauw (2002), Jacob and Lefgren (2004), or Ludwig and Miller (2007).

In the application to the retirement instrument, more formally, if retirement was entirely exogenous and fixed at 60 for all individuals, the following standard specification could be used for a sharp discontinuity design

$$LS_{it} = \alpha_0 + \sum_l \beta_l Dtime_l + \sum_j \gamma_j Agecat_j + \sum_k \delta_k Controls_k + \theta * 1(T, Age > \overline{\text{Re}tage}) + u_i + \varepsilon_{it} \quad (1)$$

Where LS_{it} is life satisfaction of the i-th individual at time t, $\overline{\text{Re}tage}$ is an age threshold common to every individual (i.e. 60) and the regression includes usual controls, age and time dummies. In this case, the test on the significance of the treatment would be based on the significance of the θ coefficient.

However, since large part of retirement decisions are voluntary and not concentrated at 60 (but agglomerated around 60-63 years), retirement age is partly endogenous and it may be, in turn, correlated with its effects on happiness. What therefore needs to be done is to devise a "fuzzy" discontinuity design in which the treatment is instrumented with the age-retirement function *f(RA)*. The function takes the value of the share of retired individuals in the population for each individual age observation. It cannot be affected by a single individual and has the advantage of being uncorrelated with age dummies. As a consequence the estimate should be

$$LS_{it} = \alpha_0 + \sum_l \beta_l Dtime_l + \sum_j \gamma_j Agecat_j + \sum_k \delta_k Controls_k + \theta[f(RA)] + u_i + \varepsilon_{it} \quad (2)$$

where *f(RA)* is the retirement age function. To avoid that the function captures also the retirement effects not related to the relational good effects, the retirement dummy needs to be added among the regressors.

4.5 How happiness can help to measure the unmeasurable

One of the most interesting applications of happiness studies is given by the opportunity they give to calculate shadow values of non market goods. The main contributions in this field are those valuing air pollution (Welsch, 2002 and Luechinger, 2007), terrorist activity (Frey et al., 2009), noise nuisance (van Praag and Baarsma, 2005) and flood disasters (Luechinger and Raschky, 2009).

The approach followed by these authors is that of calculating the compensating surplus (henceforth also CS) of a given variable for the individual *i* measured as:

$$CS_{i,t} = Y_{i0}(1 - \exp(\hat{\alpha}_2 * (\alpha_1)^{-1})\Delta Pi \quad (3)$$

where α_2 is the coefficient of the given non market variable and α_1 is the coefficient of income. The main limit of this approach is that (as shown by most empirical evidence) monetary compensations have a greater effect on subjective wellbeing for individuals with lower levels (and higher marginal utility) of income (Diener and Seligman, 2004; Fahey and Smyth, 2004). Van Praag and Baarsma (2005) correctly observe that this fact has the politically problematic implication that compensation for an attribute which is detrimental to happiness will be greater for those with higher incomes (and lower marginal utility of it). The problem becomes more serious in cases in which the coefficient on income is found to be quite small and, in

some cases, not significant (Wildman and Jones, 2002) or even negative (Clark 2003, Clark and Oswald, 1994).

It is evident that, in spite of these limitations, the approach may be preferred to the alternative of contingent evaluation. As Carson and Mitchel (1989) and Diamond and Hausman (1994) correctly argue, direct questions on the willingness to pay for a given attribute are much more likely to be biased. A first bias is determined by the fact that the respondent knows that his response may affect the decision on the quantity of a public good or service provided. A second bias is related to limits in the computational abilities of the respondents when the scenario presented by the interviewed is too far from reality. A third bias (embedding effect) arises when observing that in many empirical results quantitative responses tend to be strikingly similar despite of the different situations presented within the same scenario. The interpretation is that respondents have a clear idea of their general willingness to pay for a given good, but not on its exact amount and on its elasticity to changes in the side conditions prospected in the hypothetical demands. A fourth problem is that respondents may tend to please the interviewer. This creates an upward bias on willingness to pay findings.
With the life satisfaction approach none of this biases applies: there is no direct elicitation of the willingness to pay for the specific attribute under scrutiny (and no complex valuation effort required) since the shadow value is calculated indirectly with coefficients of life satisfaction estimates. Therefore the respondent cannot be aware of the intention of the researcher and answer strategically.

5. Happiness, indicators and economic policies

As it may be well understood from the starting point of our survey (the discussion of the Easterlin paradox), one of the main motivations of happiness studies is the desire to interpret the anomalies in the relationship between monetary wellbeing and life satisfaction. The implicit assumption of economists has been often that the increase of economic value created coincides with the broader concept of wellbeing (or, otherwise said, that it was not up to economists to care about negative side consequences in other dimensions arising from the maximisation of such goal). Unfortunately, the separation of social disciplines, if it may help to concentrate the focus in the realm of positive economics, has definitely no sense in normative economics. Since economic decisions have consequences on all dimensions of human life, it is meaningless to propose policy solutions without considering in full their social and environmental externalities. More specifically, economists may also investigate only the specific economic effect of a given policy action but cannot draw from it an ultimate indication on the validity of such action without considering also the non economic effects of it.
The most typical example in the above mentioned problem generated by the "Babel tower" of the separation of disciplines has been the conflict of prescriptions between economists and

environmentalists which has gone on for a long time. The first focus on the problem of poverty and creation of economic value and suggest that one of the main solutions is to stimulate aggregate consumption and foster economic growth. The second concentrate on the problem of environmental degradation and suggest the opposite since a reduction of consumption would bring with it a reduction of polluting emissions, less depletion of natural resources and a reduction of the "ecological footprint" (Wackernagel and Rees, 1996).
The life satisfaction approach goes beyond the separation among disciplines and requires understanding of psychology, sociology, environmental sciences if we want to understand and interpret the consequences of economic action on individual life satisfaction.
Life satisfaction studies overcome such separation since economic, psychological (i.e. hedonic adaptation) and sociological (i.e. role of peers and relative income) factors jointly concur in affecting subjective wellbeing. They may therefore make our policies more efficient in pursuing societal wellbeing by integrating perspectives from different disciplines and demonstrating the importance of interpersonal relationships, identifying trade-offs and crowding out effects between monetary and non monetary factors, calculating the value of many non market goods in terms of our wellbeing, evaluating the relative weight between two different economic variables in terms of happiness.
Results from empirical studies on this field have contributed to give empirical support to the construction of a new set of indicators to be used for measuring progress in economically and environmentally sustainable wellbeing.
In this perspective one of the results of happiness studies has been that of demonstrating the need of looking at a wider set of indicators to measure societal progress an human wellbeing. Since most of these indicators already exists the true problem is the emphasis given by economists, policymakers and the press to them. If this is the direction for the future, it is not however advisable to move to the extreme of maximising self declared life satisfaction. This indicator is in fact subject to bias and it would even more so if interviewed individuals would know that it becomes the crucial indicator for economic policies. Furthermore, if subjective wellbeing may tell us whether fundamental dimensions of the human being are neglected by standard economic approaches, the same measure tends in some cases to overstate personal needs without regard for their compatibility with socioenvironmental equilibria. To make an example if we would rely on the direct effect of climate change on individual wellbeing (without considering its indirect side effects on health and global warming) we should conclude that nothing needs to be done against it since most people (especially those living in cold and temperate areas) generally like to have warmer temperatures and more sunny days.
Another caveat on the straightforward use of life satisfaction indicators for measuring wellbeing comes from the "happy slave paradox" (Sen, 2005) where it is correctly argued that happiness studies must not fall into the trap of considering subjective happiness as the only criterion, with the serious risk of implicitly legitimating exploitation and poor living conditions in those cases in which they lead to adaptation of the human being to misery.

The right direction to take is therefore that of considering a wider set of existing indicators which help us to understand whether policies are correctly pursuing the target of creating economic value in a socially and environmentally sustainable way or, better and slightly changing the position between goals and constraints, of creating the conditions for the

maximisation of individual wellbeing under the constraints of environmental sustainability and the necessary creation of economic value.
Having said that, another daunting methodological problem we face along this path is in the challenge of defining a composite indicator which takes properly and parsimoniously into account all these dimensions. Since at the moment there are no objective and universally accepted rules to weight individual indicators in the aggregate index, the most honest approach is that of declaring one's own weights and of showing the dynamics of the simple indicators. In the same way we know that, for our safety when driving a car, we must not look only at the speed but also to all other signals related to brake, oil, water conditions and we do so looking at each information separately and not by aggregating it in a superindex of car conditions.
To provide an example on how also in the recent past international institutions were already taking into account in their report this issue, the 2003 World Bank Report describes societal wellbeing in a picture in which, together with the central part of the diagram which considers the typical economic measures (production, consumption and growth), the two left and right sides of it include social and environmental factors which are considered in their dual function of being production factors and contributing per se to individual wellbeing.
What probably has to be reinforced in this scheme, and also in the economic research, is the emphasis on how good quality relationships may be the infrastructure which helps to produce more interpersonal trust and social capital, two crucial resources for economic prosperity and the fundament for all economic relationships in a framework of asymmetric information and incomplete contracts. The paradox, well illustrated in some games (public good game, prisoner's dilemma, traveller's dilemma and investment game) which mimic crucial and recurring aspects of economic life, is that good relationships, cooperation and team working often generate Pareto superior results with respect to the traditional individualist approach following Nash rationality (Mc Cabe et al., 2003; Basu, 1994).
To conclude with, politicians would better not neglect what comes out from happiness studies in order to understand the deeper motivations of human economic actions, productivity and entrepreneurship. Policy measures designed with the aim of maximising output growth, which do not consider their eventual unintended consequences on non monetary factors affecting individual wellbeing, can achieve their primary goal of economic growth (even though they may have even problems on it due to the above mentioned game theoretic cooperative paradoxes) but seriously risk of missing the target of consolidating political consensus if indirect negative effects on happiness more than compensate the benefits of a more affluent society.

5.1 An application of happiness methodology to macroeconomic policies: the inflation-unemployment trade-off revisited

Beyond the more general reasoning developed in the previous sections one of the main applications of happiness studies on economic policies concerns studies on the relationship between inflation and unemployment.

Unemployment and inflation are two crucial indicators for the evaluation of the effectiveness of economic policies so that a typical measure of the performance of the latter can be based on composite indicators which arbitrarily assign certain weights to the two bads. One of the most famous is the rule of thumb of the "Misery Index" which calculates countries' well being levels with a simple unweighted sum of the unemployment and inflation rates. The implicit (and strong) assumption is that a one percent rise of inflation and unemployment generate the same welfare loss.

Di Tella et al. (2001 and 2003) revisit this issue by using the life satisfaction approach and show that the Misery Index underestimates the relative cost of unemployment. Their source is the Eurobarometer Survey containing information on self reported life satisfaction of more than 634,000 individuals from 1975 to 2002.
The authors follow a two stage approach. In the first stage they regress the self-declared level of life-satisfaction on a set of personal characteristics, year and country dummies and a time trend. They then calculate the country-year average prediction error from the first stage and obtain an (unbalanced) panel of "unexplained" satisfactions where every country has one observation per year. In the second stage they regress this newly created variable on the three-year moving average inflation and unemployment rates, year and country dummies and a time trend. More formally, in the first stage they estimate the following regression:

$$H_{ijt} = \alpha_{ijt} + \gamma U_{ijt} + \sum_n \delta_n X_{nijt} + \varepsilon_{ijt} \qquad (4)$$

where H_{ijt} is the happiness level in the period t of the individual i living in country j, U is a dummy variable which takes value 1 if the individual is unemployed and 0 otherwise and Xn the n-th control variable in the individual happiness estimates. Country unemployment and inflation rates are obviously excluded from the X_{njt} controls. In the second stage they estimate the following equation:

$$\eta_{jt} = \beta_{jt} + \psi\pi_{jt} + \varphi u_{jt} + \sum_m \theta_m Y_{mjt} + \nu_{jt} \qquad (5)$$

where η_{jt} is the average unexplained residual for country j at time t from the first stage individual happiness equation, π and u are the three-year moving-average inflation and unemployment rates, Y_m is the m-th control variable (e.g. lagged levels of unemployment and inflation and current and lagged levels of GDP).

On the basis of results from these estimates the authors calculate a Trade-Off Index (TOI) which expresses the ratio between the social cost of a one percent change in unemployment and the social cost of a one percent change in inflation as [33]

[33] This choice is preferred to the alternative of weighting the first coefficient at the numerator for the unemployment rate, which would make the index no longer a marginal rate of substitution and dependent on the unemployment level.

$$\text{TOI} = \frac{\text{Cost of Unemployed} + \text{Cost of Unemployment}}{\text{Cost of Inflation}} = \frac{(\gamma + \varphi)}{\psi} \qquad (6)$$

where γ is the regression coefficient of unemployed individuals in the first stage life satisfaction estimate, while φ and and ψ are respectively the coefficient of the unemployment and the inflation rate in the second stage regression.

With their two stage approach the authors demonstrate that policymakers should trade off a one percent reduction in unemployment with a 1.66 percent increase of inflation in order to maintain constant the level of welfare. This finding contradicts the Misery Index hypothesis that the two "bads" (measured in percent values) have to be considered as perfect substitutes.

A main point of the paper is that the cost of unemployment is higher also because it does not affect only unemployed individuals. In fact, the cost of unemployment is given by the sum of two components: the psychological cost of being unemployed (which affects only jobless individuals participating to the labour market) and the effects of the unemployment rate on employed individuals (which affect all the remaining population worried about contagion of the disease or emotionally involved in unemployment of some friends or relatives).

Becchetti, Castriota and Giuntella (2009) extend these results in two directions by testing whether the inflation/unemployment trade-off changes according to age and the degree of employment protection in different countries. Using the same database for an extended time period (Eurobarometer Survey, 1975-2002) they document that the relative cost of unemployment versus inflation is markedly higher in central age classes and in countries with lower employment protection (EPL). The last result is consistent with the relatively higher probability of loosing a job in such countries but more puzzling if we think also of the higher probability of finding a new job when unemployed. Potential explanations for the puzzle are habituation effects (Winkelmann & Winkelmann, 1998 and Clark, Georgellis and Sanfis, 2001) among the relatively higher share of long term unemployed, stronger informal economies in high job protection countries, and the role of social norms.

An intriguing question is about the relationship between individual preferences, labor market rules and central bank behaviour.
More specifically, the authors wonder whether the different behaviors of economic institutions in the US, UK and continental Western Europe may be partly explained by the differing worries about unemployment observed among citizens – even though the differences which emerge when comparing, for instance, the main targets declared in the statutes of the ECB and the Federal Reserve are not always supported by robust empirical evidence (Sardoni and Wrai, 2005; Cobham, 2006).

With regard to such differences it can be observed that the EU found consensus for the creation of an independent Central Bank with a clear anti-inflationary stance[34] and no explicit consideration of an unemployment target. [35] By contrast, the statute of the Federal Reserve lists six main monetary policy objectives, does not fix any clear inflation target, and asserts that monetary policy should both sustain economic growth and fight price increases.[36] Central Banks aside, it has to be noted that the UK government has based its decision not to enter the EMU also on the fear that it would not be possible to pursue an active independent employment policy.[37]

This interpretation is only one among the several considered in the literature to explain the different behaviours of the two Central Banks. Sahuc and Smets (2008) refer to it when they write that "*the explicit dual mandate of the Federal Reserve may lead to a larger weight on the stabilization of output around its sustainable path and a stronger response to developments in the output gap. This could in turn explain why policy rates move more strongly in response to the business cycle.*"

These authors provide two additional explanations, however. First, the size, composition and voting mechanisms of the two CBs may determine differences in the speed of reactions to shocks. Second, economies and shocks are markedly different in the two areas.[38] Without

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[34] *Protocol on the Statute of the European System of Central Banks and of European Central Bank. Objectives and tasks of the ECB (1992). Article 2:* "In accordance with Article 105(1) of this Treaty, the primary objective of the ESCB shall be to maintain price stability. Without prejudice to the objective of price stability, it shall support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community as laid down in Article 2 of this Treaty. The ESCB shall act in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources, and in compliance with the principles set out in Article 4 of this Treaty."

[35] De Grauwe (2005) cites two main reasons for the ECB's approach, which he considers relatively more conservative and concerned about inflation. The first is the emphasis placed in the 1980s on the central bank's independence (Barro-Gordon, 1984) and the call for a more conservative central banker (see Rogoff, 1985). The second is the role played by Germany in shaping the EMU and the Eurosystem.

[36] *Federal Reserve Act (1913)*, Section 2A - Monetary Policy Objectives: "The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and creditaggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."

[37] Gordon Brown, as Chancellor of the Exchequer, in 1997 set out five economic tests on which any decision about UK membership of the EMU should be based: i) Cyclical convergence: are business cycles and economic structures compatible so that we and others could live comfortably with euro interest rates on a permanent basis?; ii) Flexibility: if problems emerge is there sufficient flexibility to deal with them?; iii) Investment: would joining EMU create better conditions for firms making longterm decisions to invest in Britain?; iv) Financial services: what impact would entry into EMU have on the competitive position of the UK's financial services industry, particularly the City's wholesale markets?; v) Employment and growth: in summary, will joining EMU promote higher growth, stability and a lasting increase in jobs? The Executive HM Treasury Report (1997) concluded as follows: "We need to demonstrate sustainable and durable convergence before we can be sure that British membership of EMU would be good for growth and jobs. Joining before such convergence is secured would risk harming both".

[38] More specifically, if the interest rate sensitivity in the United States of various demand components is different from that in the Euro area, this will affect the size of the interest rate changes required to maintain price stability, even in face of similar shocks. Furthermore, the euro area economy may be more rigid in presence of economic shocks and therefore require a more cautious response by monetary policy to news. A final point is that the size

ignoring the relevance and validity of these two additional explanations, the considerations provided above may be helpful for checking whether the statutory differences between the two CBs are consistent with data on differences in inflation and unemployment costs in terms of psychological wellbeing within different institutional settings.

6. Conclusions

At the beginning of the third millennium the globalised world faces a three-sided problem. First, borrowing an expression from a recent international campaign, in spite of our extraordinary technological advances which made it possible the survival of a much larger population than in the pre-industrial evolution era we did not succeed in "making poverty history" and the "bottom billion" of the world population is still estimated to live in extreme poverty and below the symbolic poverty line thresholds. Second, while trying to create more economic value (or to redistribute it better) in order to improve conditions of the poor we face at the same the time the challenge of global warning and of the negative environmental externalities generated by current production systems. Last but not least, evidence like that of the Easterlin paradox but also of other indicators such as the increasing consumption of antidepressive pills in high income countries, make economists aware that economic growth does not necessarily coincide with improvement of human wellbeing and especially so at already high levels of per capita income.

In this framework the life satisfaction literature, without having the presumption of replacing existing wellbeing indicators with self declared happiness, may bring important elements of reflections.

First of all it suggests us, together with the increasing number of results in revealed choices and lab experiments, to depart from the anthropological reductionism of the fully self-interested rational paradigm, evidencing the important role played by sympathy, commitment, reciprocity, inequity aversion in our experience and choice utility. Second, it helps policymakers to understand the ranking of human priorities.

Did we need the additional contribution of life satisfaction studies if we already had powerful concepts such as functionings and capabilities ? Yes we did.

The capability approach often implies the goal of the enlargement of the frontiers of human possibilities implicitly suggesting that such goal coincides with the increase of aggregate life satisfaction. Results from the empirical happiness literature and the life satisfaction approach bring an important distinction on this often valid principle. What really makes life satisfaction is not the extension of opportunities but a choice criterion which helps us to discern among different possibilities by understanding our progressively evolving set of preferences and the link of them with our deep satisfaction. The life satisfaction literature says that we can get lost

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and source of the shocks hitting both economies are different (this is particularly evident when we compare productivity growth in the two areas). To sum up, if economic structures and sensitivity to shocks are different, even a common objective function would generate heterogeneous behaviours in the two areas.

in the jungle of possibilities and confuse consumption goods and relational goods. Since marginal utility is generally decreasing for the former and increasing (or non decreasing) for the latter, this may lead us to confuse constraints with liaisons. Some of the results discussed above may be the result of the mistake of interpreting all what makes life happy with the logic of consumer goods.

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