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*Beyond GDP:
the Index of Economic Well-Being
for Lombardy*

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Working paper n. 14

September 2010



GUERINI
E ASSOCIATI

IReR – Istituto Regionale di Ricerca della Lombardia
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www.irer.it

Responsabile editoriale: Sabrina Bandera

2010 Edizioni Angelo Guerini e Associati SpA
viale Filippetti 28, 20122 Milano
www.guerini.it
e-mail: info@guerini.it

Prima edizione: settembre 2010

Ristampa: V IV III II I 2010 2011 2012 2013 2014

Printed in Italy

ISBN: 978-88-6250-294-8

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Abstract

Beyond GDP: the Index of Economic Well-Being for Lombardy

The definition and measurement of economic well-being is receiving growing attention, both in academic research and on the policy agenda, as a key factor in decision-making at all levels, both national and local. There is general agreement among economists and policy-makers that it is necessary to go beyond gross domestic product (GDP), but a new and wider definition and measurement is far from being achieved. It is for this reason that research and experiments which seek to test different definitions and indicators can contribute to the ongoing debate by furnishing empirical results. This paper attempts to measure the multidimensional well-being of the Italian region of Lombardy, for the years 1995-2005, on the basis of the Index of Economic Well-Being (IEWB) proposed by the Centre for the Study of Living Standards (Osberg, 1985; Osberg and Sharpe, 2002b, 2005). The evolution of the Index is aligned with that of per capita GDP from 1995 to 2001, but diverges in the following period. Well-being exhibits a strong decline in 2002, mainly due to a consumption crisis and a decline in voluntary work, and a slight increase in 2004-05 (owing to a positive trend in per capita consumption, voluntary work, public expenses and capital stock). Per capita GDP showed a negative trend between 2003 and 2005.

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1. Introduction

Well-being is a multidimensional phenomenon that involves different aspects of people's lives. Most of its dimensions are difficult to quantify and depend on subjective evaluations. This implies that there is neither a single, universal definition of well-being nor a unique method for its measurement. Multidimensionality makes the evaluation of well-being more difficult and requires a set of various indicators, giving rise to a number of theoretical, methodological and empirical problems. Nevertheless, the measurement of well-being is important for providing decision-making at all levels with a solid basis (Pulselli *et al.*, 2006), and there is a growing body of literature on well-being indexes that combine economic, social and environmental issues in order to measure the quality of well-being. One of the most widely-used approaches is the composite indicators approach (Stiglitz Commission, 2008; OECD, 2008b). Composite indicators aggregate elementary indexes to encompass several dimensions of well-being. On the one hand, they allow synthetic analysis to be made of the phenomenon; on the other, they can be broken down, enabling the analysis of the different components of well-being. Examples of composite indicators are: the Human Development Index (United Nations Development Program, UNDP), the Index of Economic Well-Being (Osberg and Sharpe, 1998; 2002b), the Environmental Sustainability Index (ESI) and the Environmental Performance Index (EPI) (Estes *et al.*, 2005), the Quality of Life Index (Diener, 1995). The Index of Economic Well-Being (IEWB) measures economic well-being as "command over resources" and it is based on four components: the level of effective per capita consumption, the accumulation of stocks of productive resources, income distribution and economic security.

Recently, several works have addressed the question of measuring progress and well-being in Italy at a sub-national level: see for example Mazziotta and Pareto (2009), Ciampalini *et al.* (2009), Rondinella and Segre (2009), Gismondi and Russo (2008), Pulselli *et al.* (2006), Ferrarini *et al.* (2001)¹. Our study takes the IEWB as the basis for the construction of an index of economic well-being for the Lombardy region in Italy. It is important to measure the evolution of well-being at local level because local authorities are responsible for the development of social and economic infrastructures and for the definition of local policies (Ferrarini *et al.*, 2001; Pulselli *et al.*, 2006.). The construction of indexes that measure economic well-being reliably assists the monitoring of local development and the impact of policies.

¹ Murias *et al.* (2006), Measure economic well-being at the local level for the Spanish provinces.

We have slightly modified the IEWB with respect to the original version (Osberg and Sharpe, 2005) by adding health as a specific new dimension and measuring economic security only by employment security. We focus on the specific sub-components of the Index by showing the contribution of each of them to the overall change.

The paper is organized as follows. Section two discusses definitions of well-being and sets out the main criticisms of GDP as a measure of well-being. Section three summarizes the IEWB and section four presents a methodology for its application to the Lombardy region. Section five reports estimates and compares trends in the Index and its components with trends in GDP per capita. Section six concludes and discusses the main issues for further research.

2. Well-being and its dimensions

2.1. A definition of well-being

Measuring the well-being of an individual or a nation is a complex undertaking with dimensions that extend beyond the economic measurement of income or wealth and include, for instance, individual freedom, spiritual and intellectual richness, and human relations. Figure 1 provides a possible representation of well-being and its components. A “strict” notion of economic well-being (inner ring) refers to phenomena that can be captured with standard economic indicators. A broader definition of economic well-being (second ring) includes a number of non-material aspects, and it measures “command over resources” (Osberg and Sharpe, 2005). It can be argued that it is the latter sphere that should be the object of specific economic policies (Goossens *et al.*, 2007). There is a third dimension of well-being that comprises “command over agency freedoms”, which, to use terms typical of Sen’s approach, concerns the richness of social relations and intellectual life, and personal satisfaction. These characteristics undoubtedly influence the access to economic resources and thus contribute to the definition of the economic variables, but they also have value *per se* in the measurement of well-being. The report by the Commission on the Measurement of Economic Performance and Social Progress (2009) (the so-called Stiglitz Commission) has recently identified eight key dimensions of multi-dimensional well-being: material living standards (income, consumption and wealth), health, education, personal activities including work, political voice and governance, social connections and relationships, environment (present and future conditions), and economic and physical security. In this paper we adopt the approach of Osberg and Sharpe

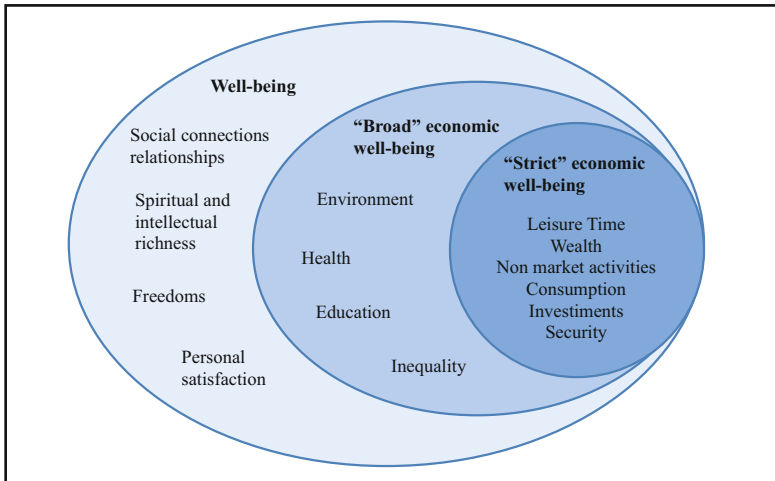
(2005) by focusing on a broad definition of economic well-being that measures “command over resources”.

Consideration of all the dimensions of well-being is difficult, and especially because many of them are qualitative and have a subjective origin. Nevertheless, the attempt to measure well-being in a broader sense is on the agenda of many international institutions, and it is a research topic for economists, social scientists and statisticians. A reliable measurement of well-being is important for understanding the effects of democratic processes:

“[...] on the one hand, it makes governments more accountable and trustworthy, and on the other, it encourages people to participate more actively [...]. We must provide our societies with new, clear and reliable tools to form their opinions, to make their assessment of the effectiveness of their democracies in fostering social progress” (OECD, 2008a, p. 19).

In particular, there is wide agreement that a better measure of economic well-being should take account of economic, social and environmental components “combined into an index with larger ambitions” (Osberg and Sharpe, 2003, p. 7). The starting point for an attempt to find a good measure of well-being is the fact that GDP should not be confused with welfare. The next section sets out the main limitations of using GDP as a measure of well-being.

Figure 1 – Elements of well-being



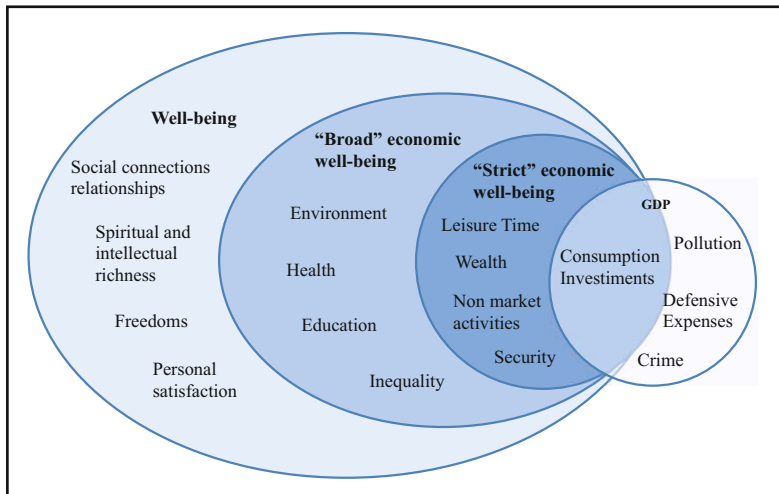
Source: Goossens *et al.* (2007), with authors' amendments

2.2. Shortcomings of GDP

Per capita GDP is the monetary indicator most commonly used to determine the value of the output of an economy per unit of time. It has also long been considered a good approximation to a nation's welfare. The relation between per capita GDP and economic well-being is perhaps stronger in the first stages of development when the main problem is satisfying basic subsistence needs (Giovannini *et al.*, 2007). In developed economies, dimensions related to social and relational characteristics (trust, voice, self-esteem, non-vulnerability) and measures of social and environmental sustainability (Goossens *et al.*, 2007) become more important in the evaluation of well-being, so that GDP diminishes in its effectiveness as a tool to measure welfare.

Moreover, GDP values elements that do not contribute to welfare (Figure 2). As R. Kennedy wrote, "gross national product [...] counts air pollution and cigarette advertising, and ambulances to clear our highways of carnage. It counts special locks for our doors and the jails for those who break them. It counts the destruction of our redwoods and the loss of our natural wonder in chaotic sprawl. It counts the cost of a nuclear warhead and armoured cars for police who fight riots in our streets [...]" (Robert F. Kennedy, Address, University of Kansas, Lawrence, Kansas, March 18, 1968). Awareness of the shortcomings of GDP is not new in the scientific and political debate. In 1934

Figure 2 – GDP and well-being



Source: Goossens *et al.* (2007), with authors' amendments

Kuznets stressed that “[...] the welfare of a nation can scarcely be inferred from a measure of national income. Distinctions must be kept in mind between quantity and quality of growth, between costs and returns, and between the short and long run” (S. Kuznets, Report to the US Congress in 1934).

The limits of GDP can be summarised in four main points:

- a) GDP measures only monetary transactions; non-market activities that contribute to economic welfare, like charity activities and domestic work, or the value of leisure, are excluded;
- b) GDP considers all transactions as positive values without distinguishing between activities that make welfare grow and activities that do not correspond to greater well-being (regrettable expenditures, road accidents etc.);
- c) GDP is an aggregate measure and does not consider the distribution of resources between individuals;
- d) GDP is a measure of flows that neither takes into account the stock of wealth in an economy, nor considers environmental and social externalities associated with productive activities.

The recognition that GDP is neither a sufficient nor a proper indicator for the evaluation of the “progress” of a complex society is increasingly widespread among leading international institutions. Several indexes have been developed that provide broader measures of economic well-being. In the 1990s the United Nations Development Programme (UNDP) introduced the Human Development Index (HDI), which combines three dimensions: life expectancy, educational attainment, and GDP per capita. In 2001 the European Commission (EU) proposed a vector of indicators linked to health, education, unemployment, poverty and inequality as measures of social performance (Atkinson *et al.*, 2002; Atkinson, 2002). The EU has also recently proposed an extended set of indicators which include, in line with the Lisbon criteria, sustainability, research and innovation capabilities, and social cohesion. The OECD has recently stressed the importance of social aspects as determinants of welfare, and it has organised several conferences on this topic (Milan, 2006; Istanbul, 2007; Boarini *et al.*, 2006).

A further recent initiative in this direction has been taken by the French government with its establishment of a commission to propose an appropriate measure of a society’s economic and social performance (the so-called Stiglitz Commission, from the name of its President).

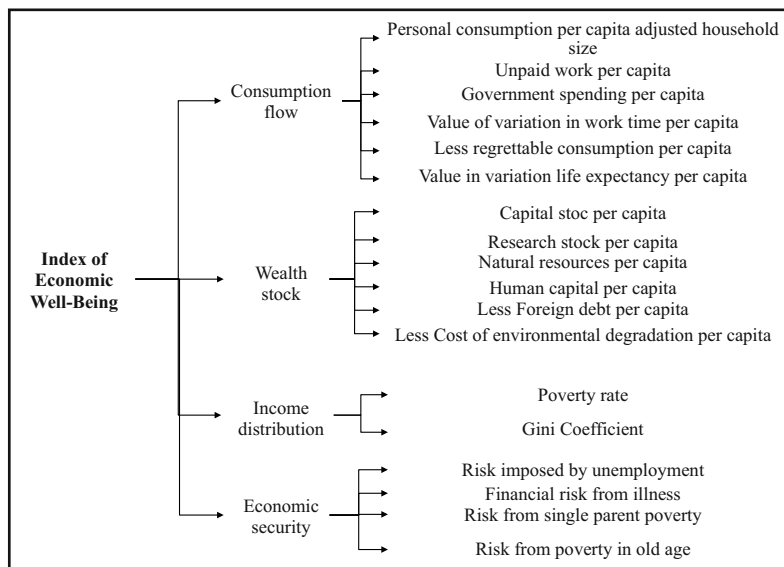
The next section describes one of the most recent and complete well-being indicators: the Index of Economic Well-Being, developed by the Centre for the Study of Living Standards (CSLS). In section 4 we apply this Index to Lombardy.

3. Methodological background: the Index of Economic Well-Being (IEWB)

The Index of Economic Well-Being was developed by the Centre for the Study of Living Standards (CSLS) (Osberg, 1985; Osberg and Sharpe, 2002b; 2005; Smith, 2003) and it is one of the best known indexes used in the estimation of economic well-being (Sharpe, 1999). The IEWB follows the “composite indicators approach”, which combines several elementary sub-indexes to cover a broad spectrum of domains affecting well-being (Stiglitz Commission, 2008). The weighting procedure used to aggregate elementary indexes is arbitrary, so that this approach “does not provide a unified way of measuring heterogeneous dimensions of well-being” (Stiglitz Commission, 2008, p. 13). As suggested by Osberg and Sharpe, a society’s well-being is not a single, objective number; rather, individuals in a society make subjective evaluations of objective data (Osberg and Sharpe, 2005). It is for this reason that the weights attached to each component vary according to subjective evaluations.

The IEWB measures well-being in terms of command over resources, and it covers four dimensions: current effective per capita consumption flows, net societal accumulation of stocks of productive resources, income distribution and economic security. In particular, sub-indexes are constructed as follows (Figure 3).

Figure 3: The CSLS Index of Economic Well-Being (IEWB)



1. *Consumption flows* include market consumption adjusted for variations in household size (economies of scale in household consumption), unpaid work (charity and housework), government spending, variations in working time and in life expectancy. Finally, regrettable or defensive expenses are subtracted.
2. *Wealth stocks* identify the accumulation of productive resources and include the net physical capital stock, the stock of research and development expenditures, the stock of natural resources and the stock of human capital. To better capture the well-being of future generations, the level of foreign debt and the costs of environmental degradation (due to CO₂ emissions) are subtracted from the stocks of wealth. The sub-components of the consumption flows and wealth stocks are expressed in constant dollars on a per capita basis.
3. The *inequality dimension* encompasses inequality of income distribution, defined by the Gini coefficient, and intensity of poverty, measured using the Sen-Shorrocks-Thon index. This component is a weighted average of the two indexes.
4. The *economic insecurity* dimension aggregates four sources of risk: unemployment, illness, widowhood (or single female parenthood) and old age. The costs of risk are estimated as the product of the probability of being in that condition and the extent to which the people are protected from risk.

Sub-indexes are normalized through linear scaling over the historical range of values observed for all the countries that are taken into account, thus allowing comparison of both the trend over time and cross-country levels of economic well-being. Indexes are then aggregated using weights that vary according to subjective evaluations of the relative importance of each dimension of well-being.

The four components of IEWB recognize “both trends in average outcomes and in the diversity of outcomes, both now and in the future”, as shown in Table 1 (Osberg and Sharpe, 2005, p. 314).

Table 1. Dimensions of economic well-being or command over resources

Concept	Time period	
	Present	Future
□ Typical citizen □ □ representative agent □	Average flow of current income	Aggregate accumulation of productive stocks
Heterogeneous citizens	Distribution – income	Insecurity on

Source: Osberg and Sharpe (2005)

4. IEWB: an application to Lombardy

4.1. Dimensions of economic well-being

This study takes the IEWB as its starting point and develops an index of economic well-being for Lombardy. A first difference between the Osberg and Lombardy estimations of the IEWB is that the former examines the trend of economic well-being both over time and across countries, the latter analyses the changes in Lombardy well-being over time. A second difference is that we add health measures as a further dimension of the Index (the final report of the Stiglitz Commission [2009] identifies health as one of the key elements of well-being). On the other hand, being constrained by data gaps at the regional level, we cannot evaluate environmental conditions and we measure economic insecurity only in the employment dimension through the risk of unemployment.

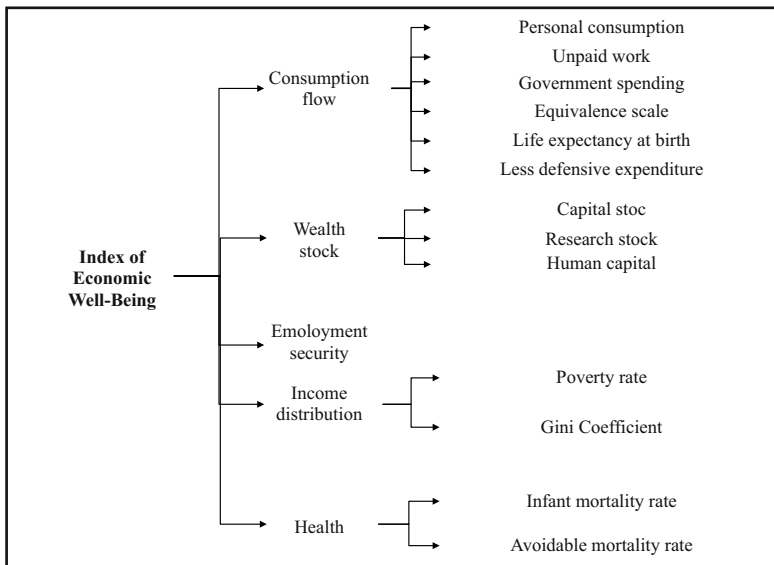
Our IEWB combines five dimensions; each dimension may be the weighted sum of different sub-components (Figure 4).

1. *Consumption flows*. These include four sub-components: i) consumption of market goods and services adjusted for variations in household size (economies of scale) and life expectancy, ii) government spending, iii) unpaid work (charity and housework), iv) defensive expenditures (commuting costs and costs of road accidents), which are subtracted from the above components.
2. *Wealth stocks*. These include three sub-components: i) fixed capital stock adjusted for depletion of natural resources (farmland and non-renewable resources), ii) a measure of the accumulated stock of research and development, iii) the stock of human capital. Because of the lack of data at a regional level, we do not consider the value

of stocks of natural resources and the costs of environmental degradation due to CO₂ emissions, which are included in the IEWB proposed by Osberg and Sharpe.

3. *Employment security index.* This dimension captures the risk of unemployment measured as the probability of becoming unemployed (proxied by the unemployment rate) (Osberg, 2009; Osberg and Sharpe, 2009). Because of the lack of data at a regional level, the security component of the index measures only the unemployment issue, and does not include the other sources of security considered in the original IEWB and described in section 3.
4. *Income distribution.* Following Osberg and Sharpe, we include inequality of income distribution and poverty as elements of the Index. We measure two sub-components of this dimension: i) inequality through the Gini coefficient, ii) the intensity of poverty with the Sen-Shorrocks-Thon index.
5. *Health.* We construct the health index by defining a mortality index with two sub-components: i) infant mortality, which is an internationally recognised index of a population's health condition, and ii) avoidable mortality, defined as deaths that should not occur in the presence of effective and timely health care. In particular, we consider the following causes of death: HIV, suicide, cancer due to smoking and drinking habits. Child and avoidable mortality indexes are transformed in health indexes by an algebraic transformation.

Figure 4 – The Index of Economic Well-Being applied to Lombardy



The overall Lombardy IEWB is constructed as a weighted average of the five dimensions. With α_t denoting the subjective weight associated with each dimension, we have at time t :

$$(1) \quad I_t = \sum_{k=1}^5 \alpha_k I_t^k \quad (\sum \alpha_k = 1)$$

Each dimension I_t^k can have more than one sub-component, each with a specific objective weight in terms of monetary value (for instance, consumption vs. public expenditure for the first dimension) or in terms of reference population (as regards the two mortality variables in the health dimension). If we call $V_t^{h,k}$ the value of the sub-component h for the k -th dimension at time t , we can write:

$$(2) \quad I_t^k = \frac{\sum_h^{\bar{h}_k} V_t^{h,k}}{\sum_h^{\bar{h}_k} V_0^{h,k}} = \frac{\sum_h^{\bar{h}_k} \frac{V_t^{h,k}}{V_0^{h,k}} V_0^{h,k}}{\sum_h^{\bar{h}_k} V_0^{h,k}} = \sum_h^{\bar{h}_k} I_t^{h,k} q_0^{h,k} \quad (\forall h \subset h_k)$$

with:
$$q_0^{h,k} = \frac{V_0^{h,k}}{\sum_h^{\bar{h}_k} V_0^{h,k}} \quad (\sum_h^{\bar{h}_k} q_0^{h,k} = 1)$$

The overall index of well-being can consequently be written as a weighted sum of the whole vector of sub-components, as in equation 3. This will be useful for the detailed analysis of the contribution of each sub-component to changes in the index (see sub-section 3.2):

$$(3) \quad I_t = \sum_k^5 \sum_h^{\bar{h}_k} I_t^{h,k} (\alpha_k q_0^{h,k}) = \sum_k^5 \sum_h^{\bar{h}_k} I_t^{h,k} \pi_0^{h,k} \quad (\sum_k^5 \sum_h^{\bar{h}_k} \pi_0^{h,k} = 1)$$

4.2. Data and variables

This section details how we estimated the five key dimensions of the index and their data sources (see appendix A for a more specific description of the methodology and appendix B for the list of data sources).

1. *Index of per capita adjusted consumption.* The per capita Adjusted Consumption Index was obtained by adding to final consumption of goods and services the value of housework and charity work services, the current public expenditure and by removing defensive expenses. The resulting value was subsequently divided by Lombardy's population, deflated with GDP deflator and indexed to 1995 as the base year.

- a) *Adjusted final consumption*. This component was based on final consumption at current prices for the period 1995-2005. The value was first corrected using the Carbonaro equivalence scale and then multiplied by an index measuring the increase in life expectancy to capture the effect on well-being relative to improvements in living conditions.
 - b) *Housework and charity work*. The values of both housework and charity work were computed as the product of hourly wages times the number of average yearly hours devoted to each activity times the population aged over 15. These values were firstly computed for men and women separately and then added up. Yearly hours devoted on average to housework and charity work were computed using the ISTAT Multiscope Survey (subset data for Lombardy). The housework hourly wage was estimated by using ISTAT gross salaries of domestic services at current prices. The hourly net salary was obtained by applying a coefficient representing the weight of taxation on wages (OECD parameters). The hourly wage for charity work was computed in the same way, but starting from the gross salary of *Other public, social and personal services*.
 - c) *Current public expenditure*. Public expenditures for staff, goods and services were computed through Regional Public Accounts.
 - d) *Defensive expenditure*. This item represented all costs related to commuting activities and road accidents. The cost of commuting was computed by applying to transport expenditures in Lombardy the share that can be attributed to commuting, the estimation of which was obtained through a 2002 regional survey on commuting workers. The costs of road accidents were computed by multiplying the number of road accidents in Lombardy by the average social and administrative cost of a road accident (national data).
2. *Index of Wealth Stocks*. The measure of the stock of wealth was computed as the sum of the adjusted fixed capital stock, the R&D stock and the human capital stock; this sum was then divided by the Lombardy population and indexed to 1995 as the base year.
 - a) *Adjusted fixed capital stock*. The stock value of fixed capital was provided by ISTAT. The share attributed to Lombardy was derived from research carried out by CRENoS in 1994 (18.2% of the national amount). The value of the loss in agricultural land and non-renewable sources was subtracted from the previous estimation.
 - b) *R&D stock*. This took account of both public and private research spending² and was computed by cumulating over time annual flows with a depreciation rate of 20%.

² Universities' expenditures on research were not included.

- c) *Human capital stock*. The human capital stock was estimated as the sum of all education expenditure made by the population of working age given the educational level attained, that is, the actual number of years spent within the school system. The data on annual average expenditure per year of schooling in Italy was taken from OECD Annual Reports. In order to capture only the real accumulation of human capital, purging changes in costs, we used the monetary cost of a schooling year in 1995 for all years.
3. *Employment security Index*. Risk from unemployment was measured by the unemployment rate provided by ISTAT (total unemployment/labour force) and indexed to 1995 as the base year (in order to associate a decrease in unemployment to an increase in well-being we computed changes in 1-unemployment rate).
4. *Income distribution Index (income inequality and poverty)*. Consistently with the IEWB approach, we evaluated income inequality by means of the Gini coefficient and intensity of poverty by means of the Sen-Shorrocks-Thon index (SST). Our estimates were based on the Survey of Household Income and Wealth (SHIW) conducted by Bank of Italy³. We used a broad definition of after-tax monthly real equivalent incomes⁴. We followed the methodology adopted by Boeri and Brandolini (2005) which considers households as the economic units of aggregation, while individuals are the welfare units. This means that each household's per adult equivalent income is counted as many times as the number of household's members. Income inequality among individuals was measured by attributing to every person his or her household's equivalent income on the basis of the OECD equivalence scale. We corrected for the presence of outliers by setting any value greater than the 99th percentile equal to the value of this same percentile (see Cannari and D'Alessio, 2003). Since a decrease in poverty and inequality corresponds to an increase in the index of well-being, we converted the Gini and SST coefficients into "positive" indexes (i.e. 1-Gini and 1-SST, see Appendix A). These measures were then aggregated using arbitrary weights reflecting the relative importance of one dimension with

³ The Historical Archive covers the years 1991, 1993, 1995, 1998, 2000, 2002, 2004 and 2006 and reports information at the household level. Missing years are estimated as linear interpolations between the two adjacent years covered by the survey.

⁴ We used a broad definition of household income as comprising wages and salaries, income from self-employment, pensions, public assistance, private transfers, income from real properties, imputed rental income from owner-occupied dwellings, and yields on financial assets net of interest paid on mortgages. We obtained real income by dividing self-reported income by the Household final consumption Expenditure Deflator (hed) available in national accounts.

respect to the other. Following Osberg and Sharpe (2002a), poverty was given three times the weight of inequality.

5. *Health Index*. This dimension includes two components: infant mortality index and avoidable mortality index provided by ISTAT (Health for all)⁵ (with 1995 as the base year). In order to associate a decrease in the mortality index to an increase in well-being, we computed health indexes as 2-child/avoidable mortality index. Subsequently, health indexes were aggregated to create an overall health index, with weights representing the reference population for the two phenomena (live births for infant mortality and total population for avoidable mortality). Mortality time series exhibit very large year to year fluctuations, which are only partly explained by climatic conditions⁶. We smooth these fluctuations by using a three-year moving average.

5. Estimates of economic well-being for Lombardy over time, 1995-2005

In this section we discuss the main results by examining the evolution of both the Index and its dimensions over time and the GDP per capita index (sub-section 5.1). We then conduct more detailed analysis of all the sub-components of the Index (sub-section 5.2).

5.1 The evolution of the index and its dimensions

Table 2 and Figure 5 describe the evolution of the five dimensions of the index. It can easily be seen that each component follows a different trend.

Consumption index, which is the most classic dimension of economic well-being, exhibits strong expansion until 2001, then it declines in 2002 with an upturn from 2004. The trend follows mainly the evolution of the sub-component of the consumption dimension, adjusted per capita consumption.

Per capita wealth stock (fixed, human and R&D) shows an upward trend throughout the whole period due in particular to a growth in the stock of physical and human capital that overhangs a reduction in R&D stocks (for decreasing investments in R&D of private firms).

⁵ Data on avoidable mortality are available for the period 1995-2003. Missing years are estimated on the basis of the average rate of avoidable mortality over total mortality in this period.

⁶ Italian Statistical Office (ISTAT) reports that the increase in the mortality rate in 2003 was mainly due to difficult climatic conditions (hard winter and hot summer) (see http://www.istat.it/salastampa/comunicati/non_calendario/20061024_00/)

The risk from unemployment decreases until 2001 and slightly increases between 2002 and 2005.

The health index contributes positively to Lombardy's overall economic well-being during the period considered. The increasing health index can be credited to better management of the regional health care system, which had a positive effect on both control and prevention activities. As noted before, because of large annual fluctuations, we smooth the health trend using a three-years moving average.

The slight improvement in income distribution from 1998 onwards indicates a more equal allocation of incomes, which is a highly positive characteristic for a complex society like Lombardy's, and a lessening in poverty.

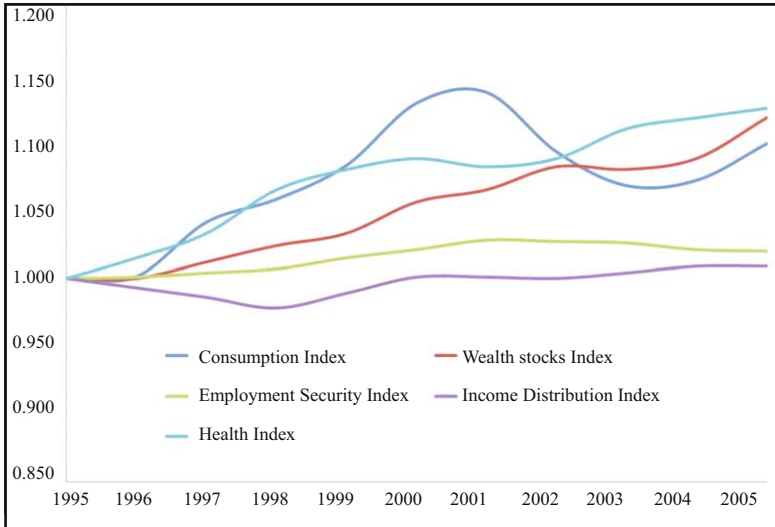
Table 2 – Dimensions of the Index of Economic Well-Being for Lombardy

Year	Consumption Index	Wealth Stocks Index	Employment Security Index	Income Distribution Index	Health Index
1995	1.000	1.000	1.000	1.000	1.000
1996	1.001	1.000	1.001	0.993	1.015
1997	1.041	1.012	1.004	0.986	1.033
1998	1.058	1.024	1.007	0.978	1.065
1999	1.083	1.033	1.015	0.989	1.080
2000	1.129	1.056	1.021	1.001	1.088
2001	1.137	1.065	1.028	1.001	1.082
2002	1.093	1.082	1.027	1.000	1.088
2003	1.068	1.080	1.026	1.004	1.110
2004	1.072	1.088	1.021	1.009	1.118
2005	1.099	1.118	1.020	1.009	1.125

In order to obtain the general IEWB, all components were aggregated by using subjective weights. According to Osberg and Sharpe's approach (2002a, 2005, 2009), we first set all weights at an equal value (simulation 1 in Figure 6)⁷. This reflects the idea that the domains are equally important and implies that every variation of opposite sign and equal magnitude in any component of the index would automatically cancel out. Do changes in consumption have as much weight as changes in health or income distribution? Which component should be regarded as the most relevant? We did not have any prescriptive rule that could help us answer this question:

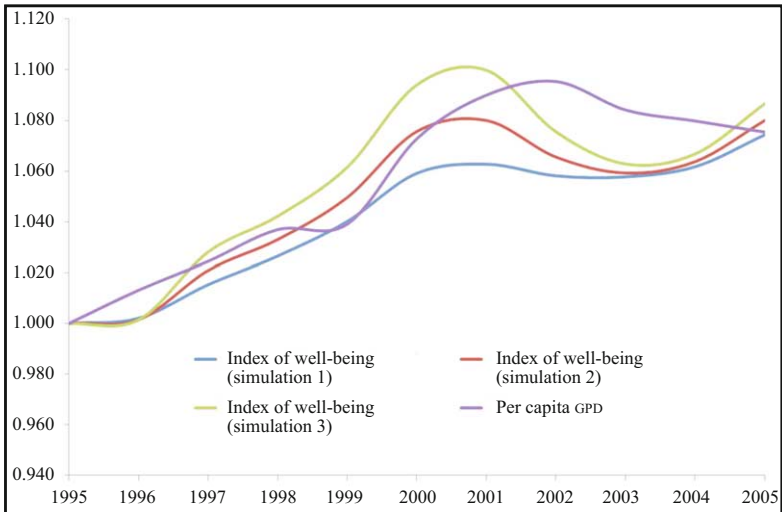
⁷ In the literature, most composite indexes assign equal weight to each component; the best known example is the Human Development Index (Osberg and Sharpe 2009).

Figure 5 – Dimensions of the Index of Economic Well-Being for Lombardy



Source: Authors' calculations

Figure 6 – Index of Economic Well-Being in all three simulations and per capita GDP



Source: Authors' calculations

weights are subjective and their identification process may vary according to people's opinions and policy makers' particular purposes. As suggested by the Stiglitz Commission (2008), it would be interesting to identify weights on the basis of a public survey in which people were asked to order different aspects of well-being by a personal judgement on their importance. Since such information is currently still unavailable, we decided to adopt the approach suggested by the literature (Osberg and Sharpe, 2002a; Osberg and Sharpe, 2009) and set two more combinations of subjective weights. In simulation 2 we associate the following weights to each component: 0.4 to consumption, 0.15 to wealth stocks and health, 0.1 to employment security and 0.2 to income distribution. Simulation 3 gave much more importance to the consumption component ($\alpha_I = 0.6$) while weighting the remaining dimensions equally (Table 3). The increase in weight given to consumption is reasonable if it is believed that people value material goods more than accumulated stocks of wealth, health, economic equality and security; this may lead to a bias against sustainability (Osberg and Sharpe, 2009).

During the 1995-2005 period, the IEWB grows in Lombardy in all the three simulations, but the evolution is sensitive to the weights chosen (see Figure 6). Under simulation 1, well-being exhibits a positive trend throughout the whole period, with a slight decrease in 2002 and an upturn from 2004. A higher weight given to consumption (from 0.2 to 0.4 and 0.6) causes a shift upward of the whole curve. Well-being exhibits a strong decline in 2002 due to a consumption crisis and then it increases in 2004-05.

Comparing the IEWB with per capita GDP (index number) shows that the two series are aligned in the first period (1995-2001), in which both indexes increase steadily, but they diverge in the following phase. The positive trend in GDP per capita continues also in 2002 (while well-being decreases in that year), but during the following 2003-05 period, GDP per capita decreases.

Analysis of the sub-components of each dimension of IEWB aids understanding which elements are responsible for the trends shown in Figure 6. The following sub-section deals with this issue.

5.2. Components analysis

Figure 7 shows the total change of each specific sub-component for the period 1995-2005. The greatest changes occurred for public expenditure⁸ in the first dimension and for child health in the last one (both with

⁸ The increase in public expenditures between 2000 and 2006 is partly due to increased resources linked to a new start of the European Community Funds for regional projects.

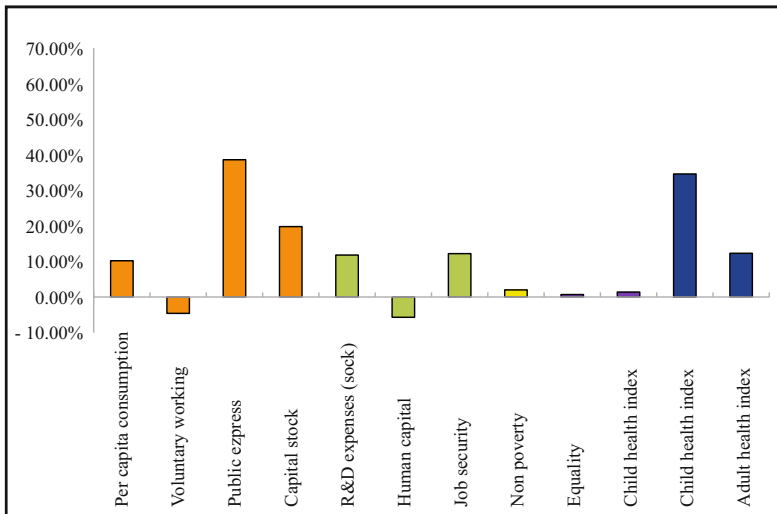
Table 3 – The weights used in the three simulations

Dimensions	Sub-components	Simulation 1			Simulation 2			Simulation 3		
		α weights	Q weights	π weights	α weights	q weights	π weights	α weights	q weights	π weights
Consumption (corrected)	Per capita consumption	0.2	0.7329	0.1466	0.4	0.7329	0.2932	0.6	0.7329	0.4397
	Voluntary working		0.2083	0.0417		0.2083	0.0833		0.2083	0.1250
	Public expenses		0.1153	0.0231		0.1153	0.0461		0.1153	0.0692
	Defensive expenses		-0.0564	-0.0113		-0.0564	-0.0226		-0.0564	-0.0339
Wealth stocks	Capital stock	0.2	0.6962	0.1392	0.15	0.6962	0.1044	0.1	0.6962	0.0696
	R&D expenses (stock)		0.0076	0.0015		0.0076	0.0011		0.0076	0.0008
	Human capital		0.2962	0.0592		0.2962	0.0444		0.2962	0.0296
Job security	Job security	0.2	1.0000	0.2000	0.1	1.0000	0.1000	0.1	1.0000	0.1000
Equality	Non poverty	0.2	0.7500	0.1500	0.2	0.7500	0.1500	0.1	0.7500	0.0750
	Equality		0.2500	0.0500		0.2500	0.0500		0.2500	0.0250
Health	Child health index	0.2	0.0086	0.0017	0.15	0.0086	0.0013	0.1	0.0086	0.0009
	Avoidable mortality health		0.9914	0.1983		0.9914	0.1487		0.9914	0.0991

more than a 30% increase); four indexes show a growth of about 10%: per capita consumption, human and physical capital stocks, and health index for avoidable mortality. There are two negative changes: voluntary work and accumulated investment in R&D. Also the increase in defensive expenses contributes to a reduction in well-being.

Many sub-components undergo a more impressive growth in the first part of the period (until 2000) and a less significant evolution thereafter (Table 4). In particular, it is worth noting the decrease in the index of consumption expenditure in the period 2001-2004.

Figure 7 – Changes in the index level of the specific sub-components, 1995-2005



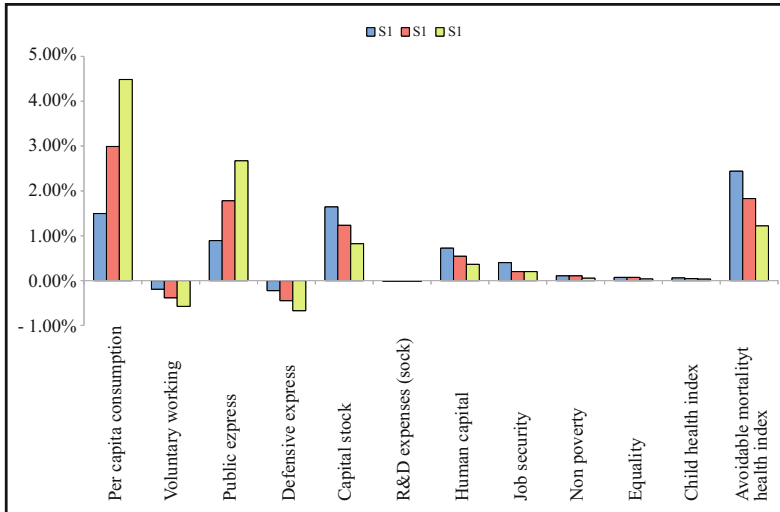
Source: Authors' calculations

If we weight the evolution of the different sub-components with the weights $\pi_{\theta}^{h,k}$ of equation 3 reported in Table 3, we can measure their specific contribution to the index in the three simulations (Figure 8). In simulation 1, with each dimension given equal weight, the evolution of the index is due essentially to four components: per capita consumption, public expenditure, capital stock, and health index for avoidable mortality. In simulations 2 and 3 the weights of consumption and public expenditure become predominant. Apart from these, the only significant items are the health index for avoidable mortality, physical capital stock and human capital (the latter less marked).

Table 4 – Indexes of the specific sub-components, $I_t^{h,k}$, 1995-2005

Year	Per capita consumption	Voluntary working	Public expenses	Defensive expenses	Capital stock	R&D expenses (stock)	Human capital	Job security	Non poverty	Equality	Child health index	Adult health index
1995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1996	1.008	0.965	1.023	1.010	0.995	1.000	1.012	1.001	0.996	0.985	1.067	1.014
1997	1.048	1.002	1.068	1.044	1.005	0.994	1.030	1.004	0.994	0.963	1.141	1.032
1998	1.072	0.999	1.127	1.161	1.014	0.990	1.050	1.007	0.989	0.946	1.196	1.064
1999	1.095	1.031	1.174	1.248	1.021	0.993	1.062	1.015	0.996	0.970	1.239	1.079
2000	1.129	1.079	1.321	1.338	1.050	1.003	1.071	1.021	1.003	0.994	1.218	1.087
2001	1.122	1.110	1.397	1.388	1.058	1.017	1.084	1.028	1.003	0.993	1.250	1.080
2002	1.100	1.010	1.326	1.359	1.075	1.014	1.099	1.027	1.003	0.991	1.255	1.086
2003	1.086	0.903	1.356	1.300	1.072	0.983	1.101	1.026	1.005	1.001	1.334	1.108
2004	1.076	0.917	1.393	1.220	1.082	0.956	1.104	1.021	1.007	1.013	1.329	1.116
2005	1.102	0.954	1.386	1.198	1.118	0.943	1.122	1.020	1.007	1.014	1.346	1.123

Figure 8 – Contributions of the specific sub-components to the overall index, in the three simulations, 1995-2005

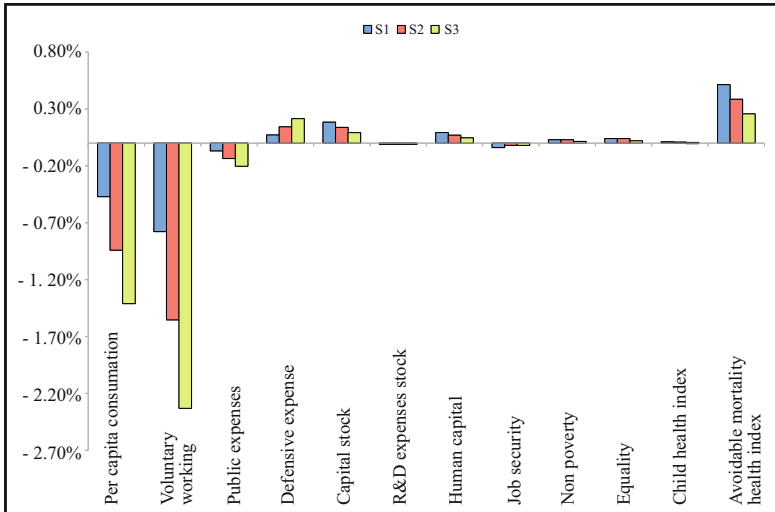


Source: Authors' calculations

As shown in Figure 6 the IEWB decreased between 2002 and 2003 in simulations that weight more consumption flows, while in 2004-05 well-being increased in all the three simulations. In order to gain better understanding of which elements determined this result, we analysed the weighted contributions of each sub-component to the overall Index for these two sub-periods (Figures 9 and 10). The negative trend was mainly due to a decrease in per capita consumption and voluntary work. Per capita consumption, voluntary work, public expenses and capital stock grew in 2004-05⁹, thus leading to an increase in the overall index.

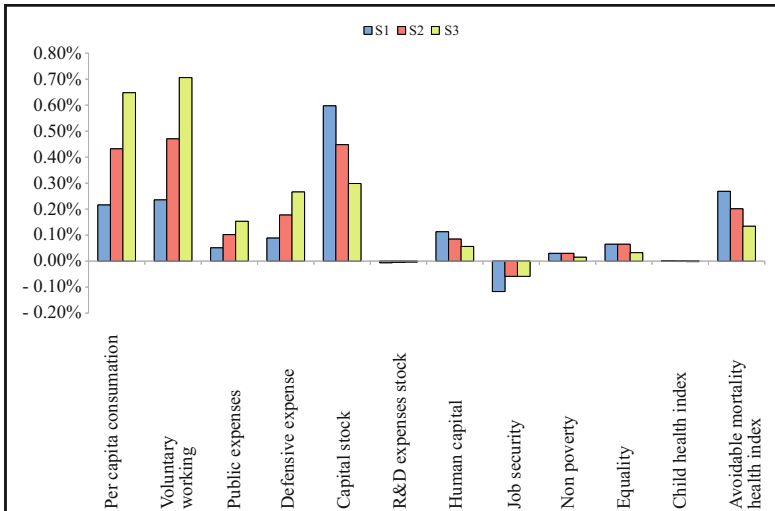
⁹ Per capita consumption grew only in 2005.

Figure 9 – Contributions of the specific sub-components to the overall index, in the three simulations, 2001-2003



Source: Authors' calculations

Figure 10 – Contributions of the specific sub-components to the overall index, in the three simulations, 2003-2005



Source: Authors' calculations

6. Conclusions

The awareness that GDP is neither a sufficient nor a proper indicator for the evaluation of the well-being of a society has led to the development of several indexes with larger ambitions, which combine economic and social trends, and address as well environmental and sustainability issues. One of the best known and most important indexes is the Index of Economic Well-Being (IEWB) developed by Osberg and Sharpe. IEWB encompasses the economic domain defined in a broad sense to include elements such as poverty, inequality, and economic insecurity. Because it is a synthesis of different dimensions, the Index can easily be broken down to specify the contribution of each dimension to the overall evolution over time. This enables policy-makers to identify problems and policies. An interesting feature of this approach is that the weights attached to each dimension of economic well-being can vary according to subjective evaluations. "It is argued that public debate would be improved if there is explicit consideration of the aspects of economic well-being obscured by average income trends and if the weights attached to these aspects were explicitly open for discussion" (Hagerty *et al.*, 2001).

This study has analyzed the economic well-being of Lombardy over time (years 1995-2005) by developing a composite indicator on the basis of the IEWB. In the analysis reported we slightly modified the Index with respect to the original version (Osberg and Sharpe 2005). In particular, health was added as a specific new dimension, while economic security was measured only by employment security. Data unavailability at the regional level was significant in some fields, in particular for the measurement of environmental conditions.

We simulated the evolution of the indicator for the period 1995-2005 in three different scenarios, changing the weights given to the different dimensions. The basic scenario (simulation 1) weighted all the dimensions equally, the other scenarios (2 and 3) attributed more weight to the consumption component. The evolution of the index was substantially in line with the evolution of per capita GDP from 1995 to 2001 but diverged in the following period. Well-being exhibits a strong decline in 2002, mainly due to a consumption crisis and a decline in voluntary work (see simulations 2 and 3), and an increase in 2004-05 (owing to a positive trend in per capita consumption, voluntary work, public expenses and capital stock). Per capita GDP showed a negative trend between 2003 and 2005.

Analysis of the specific sub-components of the index in the basic scenario (simulation 1) showed that the most important contributions to the overall change in the index were made by the health dimension, human and physical capital accumulation and, among economic aspects, the growth in public expenditure and of consumption.

A number of questions remain unresolved. Firstly, a very important issue in the construction of the Index is the choice of weights (Sharpe, 1999). As we have shown, the value of the index is very sensitive to these weights, and there is no clear agreement in the literature on the criteria to use in weighting.

Secondly, another important issue which should be considered is that of financial sustainability, for instance by using regional balance of payment indicators or the regional system's level of indebtedness. In fact, financing consumption through indebtedness makes the system (and the level of welfare) more vulnerable, as has been evidenced by the current financial crisis.

A third consideration regards environmental sustainability. The report by the Stiglitz Commission (2009) identifies environmental conditions (present and future) as a key dimension of well-being: "they are important not only for sustainability, but also because of their immediate impact on the quality of people's lives" (p. 52). According to Stiglitz, Sen and Fitoussi, existing indicators of environmental conditions are limited or badly measured, and "more work is needed to relate changes in environmental indicators to changes in well-being" (p. 52).

A fourth consideration concerns the role of capabilities as determinants of well-being. The report by the Stiglitz Commission (2009) underlines that "what really matters are the capabilities of people, that is, the extent of their opportunity set and of their freedom to choose among this set, the life they value" (p. 15). Capabilities "represent the various combinations of functionings (beings and doings) that the person can achieve. Capability is, thus, a set of vectors of functionings, reflecting the person's freedom to lead one type of life or another [...], to choose from possible livings" (Sen, 1992, p. 40). Functionings include working, resting, being literate, being healthy, being part of a community, being respected, and so forth. The challenge is to construct an index with broader ambitions and which seeks to capture not only the "command over resources" (as in IEWB) but also "command over agency freedom", i.e. capabilities.

A final issue concerns social capital, and in particular the structural dimension of social capital identified by social networks. The Stiglitz Commission (2009) points out that social connections improve the quality of life. When addressing the effects of social capital on economic well-being we have to take two main considerations into account. The first is that social capital is a multidimensional concept and each dimension may exert diverse effects on development and well-being (Sabatini, 2009). It is still unclear what type of social networks exert a positive effect on the different dimensions of development (Sabatini, 2008). In fact, social capital is a value-free concept: "it is conservative or even harmful in some cases, even if it is productive

and benign in other cases” (Paldam, 2000, p. 635). The second consideration is that, while some of the effects of social capital on economic variables may be already captured by the elements included in the IEWB, social networks give more to well-being than those effects. It would thus be interesting to investigate the relationship between social networks and non-material dimensions of well-being like capabilities on a broader definition of economic and social well-being.

Appendix A. Methodology

The index has been constructed according to the following formula (see eq. 1 in the text):

$$(1) \quad I_t = \sum_{k=1}^5 \alpha_k I_t^k \quad (\sum \alpha_k = 1)$$

with (as in eq. 2):

$$I_t^1 = \frac{{}_{pc}C_t \cdot HE_t \cdot LE_t + {}_{pc}G_t + {}_{pc}UP_t - {}_{pc}D_t}{{}_{pc}C_0 \cdot HE_0 \cdot LE_0 + {}_{pc}G_0 + {}_{pc}UP_0 - {}_{pc}D_0} = \frac{\sum_{h=1}^4 V_t^{h,1}}{\sum_{h=1}^4 V_0^{h,1}} = \sum_{h=1}^4 I_t^{h,1} q_0^{h,1}$$

$$I_t^2 = \frac{{}_{pc}K_t + {}_{pc}R\&D_t + {}_{pc}HC_t}{{}_{pc}K_0 + {}_{pc}R\&D_0 + {}_{pc}HC_0} = \frac{\sum_{h=1}^3 V_t^{h,2}}{\sum_{h=1}^3 V_0^{h,2}} = \sum_{h=1}^3 I_t^{h,2} q_0^{h,2}$$

$$I_t^3 = \frac{1 - UR_t}{1 - UR_0} = I_t^{1,3}$$

$$I_t^4 = \beta \frac{1 - SST_t}{1 - SST_0} + (1 - \beta) \frac{1 - Gini_t}{1 - Gini_0} = \sum_{h=1}^2 I_t^{h,4} q_0^{h,4}$$

($q_0^{1,4} = \beta$ is the subjective weight associated with poverty intensity vs. inequality)

$$I_t^5 = a \left(2 - \frac{IM_t}{IM_0} \right) + (1 - a) \left(2 - \frac{AM_t}{AM_0} \right) = \sum_{h=1}^2 I_t^{h,5} q_0^{h,5}$$

where:

Consumption Index:

${}_{pc}C$ = per capita consumption expenditure on final goods and services

HE = Carbonaro index to allow for equivalence scales

LE = life expectancy index

${}_{pc}G$ = current public expenditures

${}_{pc}UP$ = value of non-paid work (domestic and charity)

${}_{pc}D$ = defensive expenses (costs due to commuting activities and road accidents)

Wealth Stocks Index:

${}_{pc}K$ = adjusted capital stock at constant prices (adjusted to the loss in agricultural land and in non-renewable sources)

${}_{pc}R\&D$ = R&D stock at constant prices

${}_{pc}HC$ = human capital stock valued at 1995 prices

Employment Security Index:

UR = unemployment rate

Income distribution Index:

SST = intensity of poverty (Sen-Shorrocks-Thon Index)

Gini = Gini coefficient of income inequality

β = subjective relative weight associated with intensity of poverty

Health Index:

IM = Infant Mortality rate

AM = Avoidable Mortality rate (causes of death: AIDS, suicide, cancer due to smoking and drinking habits)

a = objective weight associated with the relative dimension of the specific population of each variable included in the Health Index:

$$a = p1/(p1 + p2); p1 = \text{live births}; p2 = \text{total population}$$

The basic year for index numbers is 1995. All monetary values are at constant 1995 prices. Current values are deflated with GDP deflator.

Appendix B. Data sources

Variables	Sources
Resident population Italy (total, males and females)	ISTAT– Health for–all
Population aged over 15 Italy	ISTAT– Health for–all
Final expenses for consumption goods current prices	ISTAT– Regional Ac counts
Gross Domestic Product – current prices	ISTAT– Regional Ac counts
Gross Domestic Product – constant prices	ISTAT– Re gional Accounts
Gross Domestic Product – chained series	ISTAT– Regional Ac counts
Gross salaries at current prices public social and personal services	ISTAT– Regional Ac counts
Gross salaries at current prices domestic services for households	ISTAT– Re gional Accounts
Total employed counts	ISTAT– Regional Ac counts
Labour force counts	ISTAT– Regional Ac counts
Total employed – other public social and personal services	ISTAT– Regional Ac counts
Total employed – domestic services for households	ISTAT– Regional Ac counts
Current public expenditures – on goods and services – Finance Minister	Regional Public–Ac counts
Transport expenditures – current prices	Regional Public–Ac counts

Cont. →

→ Cont.

Road accidents - Italy	Lombardy	Ring Lombardia
Social costs due to a road accident	ISTAT- Transport statistics	
Total net capital by proprietary branch at substitute prices	ISTAT	
Labour force and non-labour force over 16 by level of education	ISTAT- Workforce Survey	
elaborations on ISTAT data.	ISTAT	
Fixed-term employed. Total registered on 31 December	Lombardy	ISTAT
Live births Italy		ISTAT- Health for all

References

- Atkinson A.B. (2002), Social Inclusion and the European Union. *Journal of Common Market Studies*, 40(4), 625-643
- Atkinson A., Cantillon B., Marlier E., Nolan B. (2002), *Social Indicators: The EU and Social Inclusion*. Oxford University Press
- Bank of Italy (2008), *Indagine sui bilanci delle famiglie italiane*. Rome
- Boarini R., Johansson A., Mira d'Ercole M. (2006), Alternative Measures of Well Being. *OECD Social, Employment and Migration Working Papers*, N. 33, OECD, Paris
- Boeri T., Brandolini A. (2005), The Age of Discontent: Italian Households at the Beginning of the Decade. *IZA Discussion Paper*, N. 1530
- Ciampalini F., Pulselli F., Tiezzi E. (2009), Wealth and Welfare Don't Go Hand in Hand Beyond a Certain Threshold: Three Case Studies in Italy. Presented at the conference Monitoring Italy 2009: Measuring the progress of Italian society, June 3-4 2009, ISAE
- Cannari L., D'Alessio G. (2003), La distribuzione del reddito e della ricchezza nelle regioni italiane. *Temì di discussione*, N. 482, Bank of Italy, Rome
- Diener E. (1995), A Value Based Index for Measuring National Quality of Life. *Social Indicators Research*, 36(2), 107-127
- Estes R., Levy M., Srebotnjak T., de Shrebinin A. (2005), *2005 environmental sustainability index: benchmarking national environmental stewardship*. New Haven: Yale Center for Environmental Law and Policy
- Ferrarini A., Bodini A., Becchi M. (2001), Environmental quality and sustainability in the province of Reggio Emilia (Italy): using multicriteria analysis to assess and compare municipal performance. *Journal of Environmental Management*, 63(2), 117-131
- Giovannini E., Hall J., Mira d'Ercole M. (2007), *Measuring Well-being and Societal Progress. Organization for Economic co-operation and Development*. Background paper for the conference "Beyond GDP", 19-20 November, Brussels
- Gismondi R., Russo M.A. (2008), *Synthesis of Statistical Indicators to Evaluate Quality of Life in the Italian Provinces*. Dipartimento di Scienze Economiche, Matematiche e Statistiche, Università degli Studi di Foggia, Quaderno N. 2/2008
- Goossens Y., Makipaa A., Schepelmann P., van de Sand I. (2007), *Alternative progress indicators to Gross Domestic Product (GDP) as a means towards sustainable development*. Policy Department Economic and Scientific Policy, European Union
- Hagerty M.R., Cummins R.A., Ferriss A.L., Land K., Michalos A.C., Peterson M., Sharpe A., Sirgy J., Vogel J. (2001), Quality of Life In-

- dexes for National Policy: Review and Agenda for Research. *Social Indicators Research*, 55(1), 1-96
- Mazziotta M., Pareto A. (2009), *Measuring Quality of Life: an Approach Based on Non-Substitutability of Indicators*. Presented at the conference Monitoring Italy 2009: Measuring the progress of Italian society, June 3-4 2009, ISAE
- Murias P., Martinez F., De Miguel C. (2006), An economic well-being index for the Spanish provinces: a data envelopment analysis approach. *Social Indicator Research*, 77(3), 395-417
- Osberg L. (1985), The measurement of economic wellbeing. In: David Laidler (coordinator), *Approaches to economic well-being*, vol. 26 of the Research Program of the Royal Commission of the Economic Union and Development Prospects for Canada
- Osberg L. (2009), Measuring Economic Security in Insecure Times: New Perspectives, New Events, and the Index of Economics Well-Being. *CSLS Research Report 2009-12*
- Osberg L., Sharpe A. (1998), An index of economic well-being for Canada. *Applied Research Branch*, Research Paper R-99-3H, Human Resources Development Canada, Ottawa, Ontario
- Osberg L., Sharpe A. (2002a), International Comparisons of Trends in Economic Well-being. *Social Indicators Research*, 58: 349-382
- Osberg L., Sharpe A. (2002b), An Index of Economic Well-being for OECD Countries. *Review of Income and Wealth*, 48(3), 291-316
- Osberg L., Sharpe A. (2003), Human Well-being and Economic Well-being: What Values Are Implicit in Current Indices? *CSLS Research Report 2003-04*
- Osberg L., Sharpe A. (2005), How Should We Measure the “Economic” Aspect of Well-being? *Review of Income and Wealth*, 51(2), 291-316
- Osberg L., Sharpe A. (2009), New Estimates of the Index of Economic Well-being for Selected OECD Countries, 1980-2007. *CSLS Research Report 2009-11*
- OECD (2008a), Statistics, Knowledge and Policy 2007: Measuring and Fostering the Progress of Societies (Complete Edition – ISBN 9264043233). *General Economics & Future Studies*, 6, 1-567
- OECD (2008b), *Handbook on Constructing Composite Indicators. Methodology and user guide*. OECD Publications, Paris
- Paldam M. (2000), Social capital: one or many? Definition and Measurement. *Journal of Economic Surveys*, 14(5), 629-653
- Pulselli F.M., Ciampalini F., Tiezzi E., Zappia C. (2006), The index of sustainable economic welfare (ISEW) for a local authority: A case study in Italy. *Ecological Economics*, 60(1), 271-181
- Rondinella T., Segre E. (2009), Well Being in Italian Regions. Measures, Civil Society Consultation and Evidence: Presented at the con-

- ference Monitoring Italy 2009: Measuring the progress of Italian society, June 3-4 2009, ISAE
- Sabatini F. (2008), Social Capital and the Quality of Economic Development. *Kyklos*, Blackwell Publishing, 61(3), 466-499
- Sabatini F. (2009), Social capital as social network: A new framework for measurement and an empirical analysis of its determinants and consequences. *The Journal of Socio-Economics*, 38(3), 429-442
- Sen A. (1992), *Inequality re-examined*. Oxford: Oxford University Press
- Sharpe A. (1999), *A Survey of Indicators of Economic and Social Well-being*. Centre for the Study of Living Standards
- Smith J. (2003), *Guide to the Construction and Methodology of the Index of Economic Well-being*. Centre for the Study of Living Standards
- Stiglitz Commission (2008), *Survey of Existing Approaches to Measuring Socio-Economic Progress*. Joint Insee-OECD document prepared for the first plenary meeting of CMEPSP by (at Insee) Cédric Afssa, Didier Blanchet, Pierre-Alain Pionnier, Laurence Rioux, and (at OECD) Marco Mira d'Ercole, Giulia Ranuzzi, Paul Schreyer
- Stiglitz Commission (2009), Report by the Commission on the Measurement of Economic Performance and Social Progress, Paris

