



Evaluating Alternatives to GDP as Measures of Social Welfare/Progress

Working Paper no 56

Authors: Jeroen van den Bergh, Miklos Antal (UAB)

March 2014

Authors: Jeroen van den Bergh, Miklos Antal (UAB)

Reviewed by: Kurt Kratena (WIFO)

Evaluating Alternatives to GDP as Measures of Social Welfare/Progress

Work Package 202

***MS211 “Research paper on evaluating alternatives to GDP as
measures of Social Welfare and Progress”***

Working Paper no 56

This document can be downloaded from www.foreurope.eu

Please respect that this report was produced by the named authors
within the WWWforEurope project and has to be cited accordingly.



THEME SSH.2011.1.2-1

*Socio-economic Sciences and Humanities Europe
moving towards a new path of economic growth
and social development - Collaborative project*

Evaluating Alternatives to GDP as Measures of Social Welfare/Progress

Jeroen van den Bergh, Miklos Antal (UAB)

Contribution to the Project

Four categories of alternatives to GDP as a measure of social welfare or human progress are briefly evaluated. This provides potential input to policy analysis and modelling.

Jel codes:

D60, E01, O11

Evaluating Alternatives to GDP

as Measures of Social Welfare/Progress

*Jeroen C.J.M. van den Bergh*¹

ICREA, Barcelona, Spain

&

Institute of Environmental Science and Technology

Universitat Autònoma de Barcelona

Edifici Cn - Campus UAB

08193 Bellaterra (Cerdanyola), Spain

Tel: +34 935813747

and

Miklós Antal

Institute of Environmental Science and Technology

Universitat Autònoma de Barcelona

Edifici Cn - Campus UAB

08193 Bellaterra (Cerdanyola), Spain

Email: antalmi@gmail.com

¹ Also affiliated with the Faculty of Economics and Business Administration, and the Institute for Environmental Studies, VU University Amsterdam, The Netherlands.

Abstract

Proposed alternatives to GDP as a measure of social welfare or human progress are briefly evaluated. Four main categories are considered, namely ISEW and GPI based on corrections of GDP, sustainable or green(ed) GDP, genuine savings/investments and composite indexes. All these alternatives turn out to suffer from various shortcomings. Nevertheless, several of them represent a considerable improvement over GDP information in approximating social welfare. This gives support to the idea that we should not wait to give less importance and attention to GDP (per capita) information in public decision-making until a perfect alternative indicator is available.

Key Words: composite indicators; economic growth; externalities; genuine savings; green GDP; happiness; informal sector; information failure; ISEW; status goods; sustainable income.

1. Introduction

The real GDP per capita (in purchasing power parities) plays a central role in judging the position of an economy of a country over time or relative to that of other countries. This is irrespective of whether the judgement is done by politicians, public officers, macroeconomists or the media.² The GDP is thus identified, or considered even synonymous, with social welfare. This is illustrated clearly by the common substituting phrase ‘standard of living’. This use of GDP (per capita) is not supported by any (macroeconomic) theory about the welfare significance of GDP, but simply has developed into a habit in the course of time. What is perhaps most striking is that a large majority of journalists and politicians, regardless of their political preferences, make completely uncritical statements about GDP. It is not surprising then that one can observe a strong push for GDP growth worldwide. This is being reinforced by an explicit focus on GDP growth by international organizations such as the IMF and the OECD.

It so happens that there is a quite extensive theoretical and empirical literature in which the use of GDP per head as a measure of welfare and progress is being criticized, and various corrections and alternative indicators are proposed. Since the 1960s, the implicit and explicit interpretation of GDP (per capita) as a proxy of social welfare has received much criticism. Moreover, criticism has come from some of the most respected economists of the 20th century, including various Nobel laureates. Among the most well-known critics are Kuznets (1941), Galbraith (1958), Samuelson (1961), Mishan (1967), Nordhaus and Tobin (1972), Huetting (1974), Hirsch (1976), Sen (1976), Scitovsky (1976), Daly (1977), Hartwick (1990), Tinbergen and Huetting (1992), Arrow et al. (1995), Vellinga and Withagen (1996), Weitzman and Löfgren (1997), Dasgupta and Mäler (2000), Dasgupta (2001), Layard (2005), Fleurbaey (2009) and Victor (2010). The many arguments of the critique can be organized into the following eight categories (van den Bergh, 2009):

- *Principles of proper accounting:* GDP is an estimate of the costs instead of the benefits of all market-related economic activities. In addition, it does not capture various social (including external) costs.
- *Intertemporal considerations:* A positive correlation between GDP growth in certain periods with perceived progress should not be confused with the idea that GDP is a good measure of social welfare, or that GDP growth is a necessary condition for progress. Note that extrapolation of a 2 percent yearly growth rate 1000 years into the future would result in a GDP that is $(1.02)^{1000} \approx 400$ million times the current GDP. It is difficult to imagine that individual or social welfare can still increase so much. This suggests that the correlation between GDP and social welfare has to drop to zero at some point, or may already have done so.
- *Lexicographic preferences:* Within this framework, GDP per capita growth and the associated rise in material consumption is an imperfect compensation for a lack of satisfaction of basic needs, like

² The aggregate indicator GDP or gross domestic product is equal to the monetary value of all final goods and services which are being produced in a country by both its citizens and foreigners during one year. Gross national income (GNI) (formerly gross national product, or GNP) is the output generated by all citizens of a country, irrespective of where production has taken place. For most countries the difference between GDP and GNI is not very large (a notable exception is Ireland). Anyway, all the shortcomings of GDP as a welfare indicator equally apply to GNI.

community, serenity, clean air and direct access to nature. The problem is that the latter types of issues are not captured by GDP.

- *Empirical studies of happiness*: Somewhere in-between 1950 and 1970, the increase in mean welfare stagnated or even reversed into a negative trend in most western (OECD) countries, despite a steady pace of GDP growth. The ‘threshold hypothesis’ says that beyond a threshold income level the cost of growth exceed the benefits. Absolute individual income is not a suitable proxy of individual welfare as it also depends on relative income and various income-independent factors. The aggregation of individual absolute incomes in a GDP therefore cannot deliver a robust indicator of social welfare. A final insight of this literature is that individuals adapt or get used to changed circumstances, causing well-being to return after a temporary change to its baseline level. GDP does not capture this adaptation phenomenon.
- *Income distribution, relative income and rivalry for status*: GDP per capita represents average income and neglects (changes in) the income distribution. This is inconsistent with the orthodox economics’ insight that the marginal utility of income is decreasing in income. In addition, GDP does not capture income comparisons and rivalry through the purchase of status goods. As status is scarce, rivalry for it is a zero-sum game. GDP growth may thus overestimate welfare growth.
- *Formal versus informal economy*: GDP only covers transactions that have a market price and neglects informal activities that take place outside markets even though these may contribute to individual welfare. This is relevant to both developed (child care, voluntary work) and developing (subsistence agriculture) countries. GDP thus tends to overestimate the welfare impact of fundamental changes involving transitions from an informal to a formal economy. Even the sign of the change-in-welfare measurement can be wrong because such transitions can have largely negative welfare impacts, notably on relatively poor citizens of a country.
- *Environmental externalities and depletion of natural resources*: An important subcategory of unpriced effects relates to environmental externalities and resources delivered by nature. Current market prices thus insufficiently reflect social costs, causing the calculation of GDP to deliver at best an inaccurate proxy of social welfare. Moreover, whereas pollution damage does not enter the GDP, cleaning up pollution will increase it. In addition, GDP does not capture natural capital depreciation, including environmental change and depletion of resource supplies.

These various shortcomings should provide sufficient reasons to discard the GDP as a source of information for public decision-making. However, many people who accept the shortcomings think that we first have to present a credible alternative. But if GDP creates an information failure that is without any precedent, then orthodox economists should be among the first to advice in favour of removing it, irrespective of whether an acceptable alternative is available. However, realizing the persistence of the argument that we need to have an alternative first, I here will offer a critical evaluation of the most important existing alternative indicators of social welfare or human progress.

2. Alternatives to GDP

There are four types of alternative indicators available now, namely ISEW and GPI based on corrections of GDP, sustainable or green(ed) GDP also involving corrections of GDP, genuine savings/investments, and composite indexes. These will be discussed in subsequent subsections.

2.1 ISEW and GPI

A first type is based on rather pragmatic, accounting adjustments to GDP, such as the Index of Sustainable Economic Welfare (ISEW: Daly and Cobb, 1989), derived indicators like the Genuine Progress Indicator (GPI)³, and the Sustainable Net Benefit Index (SNBI) (Lawn and Sanders, 1999). These indicators represent a correction of the regular GDP by repairing important deficiencies through adding or subtracting certain partially-calculated money amounts to/from GDP.⁴ The ISEW is aimed at measuring the (consumption related) services that directly influence human welfare. This is accomplished by adding to GDP services that it omits, while deleting GDP categories that do not directly render services to consumers. The ISEW can thus be considered as a measure of the benefits of economic activity. In addition, the ISEW includes corrections to neutralize income inequality and the unsustainability of production and consumption. In particular, the ISEW approach adapts GDP for non-market goods and services (housework), defensive costs of social and environmental protection and repair (health expenditure, costs of road accidents, costs of urbanization), reduction of future welfare caused by present production and consumption (loss of natural areas, loss of soil, depletion of non-renewable resources, air and water pollution, greenhouse effect), the costs of efforts to obtain the present welfare level (commuting, advertising, duration and intensity of work), and the distribution of income and labour (inequality among workers, between employed and unemployed, between males and females). The GPI deviates slightly from the ISEW in terms of the specific categories of corrections included. Important additional categories that the GPI corrects for are voluntary work, criminality, divorce, (loss of) leisure time, unemployment and damage to the ozone layer.

The ISEW has been calculated – using slightly distinct methods – for a range of regions and countries, including Australia, Austria, Chile, Denmark, Germany, Italy, the Netherlands, Scotland, Sweden, and the UK (an overview of studies is given in Lawn, 2003; and Kubiszewski et al., 2013). The various applications show that, whereas GDP follows a rising trend, the ISEW shows a constant or even decreasing pattern after a certain time. The temporal breakpoint varies with the country, but lies somewhere in-between the late 1960s and the 1980s. Important reasons for this de-linking of GDP and ISEW have been a

³ See <http://www.rprogress.org>.

⁴ A predecessor of this approach is Nordhaus and Tobin (1972). A theoretical basis was created by Hartwick (1977, 1990) and Asheim (1994). For an overview, see Aronsson et al. (1997) and Asheim (2000). The theoretical literature shows that there are many fundamental problems with calculating a welfare measure based on GDP. Not only does it require valuation of non-market goods and services, but also it runs into fundamental problems regarding technological progress and changing prices due to open economies (international trade and relocation of activities). Another fundamental issue, neglected in most of this literature, is that status goods and rivalry in consumption cannot be addressed. This in itself would suggest a welfare-maximizing level of income rather than unlimited welfare growth. The calculation of income-based social welfare indicators is further hampered by the difficulty of translating certain basic needs into individual willingness-to-pay or accounting prices.

substitution of informal household production by services provided by the market (e.g. child care), increased inequity, natural resource depletion, and the emergence of global environmental problems (global warming, acid rain, biodiversity loss). Both ISEW and the GPI suggest that the costs of economic growth now outweigh the benefits, leading to “growth that is uneconomic” (paraphrasing Herman Daly).

ISEW does not include a correction for leisure. But happiness evidently depends on leisure. Leisure is not captured by GDP. Quite the contrary, it has an opportunity cost of not being productive in terms of contributing to GDP. A recent study by the OECD (2006) makes adjustments of GDP by valuing leisure at GDP per hour worked (which is evidently debatable), and finds that the result (in per capita terms) leads to a different ranking than according to GDP per capita. In this ranking, The Netherlands scores best of all OECD countries, for two reasons: the inactive part of the working force is relatively large, and part-time working is very common (cf. de Groot et al., 2004).

Neumayer (2000) questions the general findings of the ISEW and GPI studies. Using sensitivity analysis he suggests that the widening gap between ISEW (GPI) and GDP – supporting the ‘threshold hypothesis’ (Section 2.9) – might be an artefact of debatable methodological assumptions with regard to the valuation of non-renewable resource depletion (resource rent or replacement cost) and cumulative long-term environmental damage. In addition, Neumayer notes that the way inequality (changes) is addressed is ad hoc and should be replaced by making a preference for income equality – or aversion to inequality – explicit. For example, Jackson et al. (1997) use an Atkinson index (Atkinson, 1970). Lawn (2003) emphasizes that ISEW and GPI require more robust monetary valuation in order to arrive at acceptable indicators of social welfare.⁵ Other critiques and modification of the ISEW can be found in the literature (Bleys, 2008; Beça and Santos, 2012; Brennan, 2013; see also a defence by Lawn, 2013).

2.2 Sustainable or green(ed) GDP

A second type of indicator also starts from GDP but focuses entirely on environmental externalities and natural resource depletion. Corrections here give rise to ‘sustainable’ or ‘green(ed)’ GDP type of indicators. ‘Sustainable income’ denotes a level of income that can be sustained, i.e. that is based on a reproducible economic and environmental base. The concepts or indicators of green and sustainable GDP are rooted in welfare economics. Important externalities are noise, air and water pollution, soil erosion, resource exhaustion, desiccation, fragmentation, biodiversity loss, radioactivity, and various health-affecting toxins. Recalculation of a GDP with externalities ‘internalized’ is not a simple matter, as it implies a completely different set of prices in the economy. It is not surprising, then, that there have been few empirical exercises aimed at calculating a green or sustainable income.

The best known of these is Huetting’s Sustainable National Income (SNI), which has been developed for the Netherlands (Gerlagh et al., 2002). It is based on the conceptual work by Huetting (1974). This can be seen to reflect the basic notion of ‘sustainable income’ as expressed by Hicks (1948), with the assumption that individuals are better off if vital environmental functions remain available ad infinitum (Huetting, 1974).

The SNI approach uses a general equilibrium model that calculates the impact on national income of imposing sustainability constraints for the nine most important environmental themes (for the Netherlands): climate change; depletion of the ozone layer; acidification; eutrophication; fine air-borne particles (PM10); volatile organic compounds; dispersion of heavy metals and PAKs/PCBs to water bodies; desiccation; and soil contamination.⁶ In particular, data on abatement costs associated with these environmental themes are integrated within an existing and somewhat adapted general equilibrium model. This approach not only represents to some degree a so-called “strong sustainability” perspective, i.e. preservation of separate types of natural capital, as it allows for neither trade-offs between environmental themes nor substitution of natural by economic capital (Ayres et al., 2001).⁷ But also the approach comes down to regarding the value of environmental degradation as being equal to the conservation costs. El Serafy (2001) has criticized this, arguing instead in favour of a ‘user cost method’, which would lead to a higher sustainable income value, where the difference would depend on the speed of natural resource depletion. The (static) general equilibrium approach is required as some of the sustainability constraints on the nine environmental themes are so tight that technical measures alone cannot realize them, so that economic restructuring is inevitable. The policy interpretation of this SNI approach is that an economy is subjected to a strong sustainability policy with a tremendous impact on national income: the calculations for the Netherlands show that the SNI is roughly half the size of GDP (Gerlagh et al., 2002). Such a static data point is not very informative without a non-arbitrary reference point. Instead, comparing time patterns for SNI and GDP provides more information. To accomplish this, Hofkes et al. (2004) have analysed the development of SNI for the Netherlands over the period 1990–2000, for 1990–1995 and 1995–2000. They find that although SNI increased substantially in this period and the relative gap between SNI and GDP decreased, the absolute gap between them increased. This suggests that production in the Netherlands became less sustainable over the studied period. Over the whole period 1990–2000, the enhanced greenhouse effect appears to be the binding environmental constraint that determined most of the developments for the SNI. Nevertheless, the gap between NNI and SNI remains considerable.

Comparing SNI with ISEW (and GPI), it becomes clear that the first has the advantage of taking into account general equilibrium effects of corrections, but the disadvantage of restricting itself to environmental and natural resource issues. ISEW and GPI correct for a much wider array of GDP imperfections, even though in a partial manner that is likely to involve mutually inconsistent corrections. Furthermore, the SNI results are sensitive to the exact specification of the sustainability condition for each environmental theme, since the marginal abatement costs are sharply rising for low values of pollution or resource use. The ISEW

⁵ Atkinson (1995) and Neumayer (2000) also express criticism.

⁶ Gerlagh et al. (2002) note that the number of environmental themes might be extended. For the Netherlands, land use and waste disposal seems of high relevance as well. They further observe that the list of chosen environmental themes is biased to ‘sink’ (rather than ‘source’) functions of the environment. If the calculations were repeated for other countries, one might want to consider including source functions related to forests, mineral deposits, topsoil, fish stocks and water resources.

⁷ Of course, an element of weak sustainability is inevitable, as non-renewable resources must gradually be substituted by other types of capital (renewable resources or man-made capital).

indicator corrects for the monetary value of environmental damage, which is not the same as requiring sustainable use of environmental functions, since damage compensation does not imply restoration of environmental functions. As a result, SNI and ISEW have quite different interpretations.

2.3 Genuine savings/investments

A third type of indicator relates to distinguishing between measures of current well-being and measures of well-being over time. The latter, however, turn out to be largely theoretical in nature (see also Section 2.2). Dominant approaches here are net present value type or discounted utilitarian intertemporal or multi-generational welfare functions (e.g. Weitzman, 1976), and Rawlsian or fairness-biased maxmin functions (Rawls, 1972; Arrow, 1973; Solow, 1974). A pragmatic indicator that focuses on intertemporal issues is genuine savings (or genuine investment). It means maintaining or increasing wealth, opulence or total capital – the sum of economic, human and natural capital – by sufficiently saving in a broad sense (Hamilton and Clemens, 1999; Dasgupta and Mäler, 2000). Recently, genuine savings (GS) has been adopted as a central indicator by the World Bank, under the name of ‘adjusted net savings’. GS can be defined as traditional net savings subject to a number of corrections (Bolt et al., 2002): (i) the value of depletion of natural resources is deducted; (ii) the costs associated with pollution damage, including economic and health effects, are deducted; (iii) expenditures on education are treated not as consumption but as savings/investments in human capital and thus added; (iv) net foreign borrowing is deducted, while net official transfers are added; (v) capital depreciation (capital consumption) is deducted. The result represents a weak sustainability indicator, in that it allows for substitution of nature and natural resources by produced and human capital (Hartwick, 1977). Categories (i) and (ii) are the most difficult to estimate. Nevertheless, the World Bank has produced estimates for most countries in the world. The outcome is that, as a general rule, GS are less than half the gross savings. Moreover, genuine savings are negative for the Middle East and North Africa, and Sub-Saharan Africa regions, positive for OECD countries, and the highest for the East Asia/Pacific region (World Bank, 2006).

A main disadvantage of the GS indicator is that losses of natural capital are not regarded as worrisome as long as they are compensated by economic and human capital (weak sustainability). However, a positive value of GS does not always imply environmental sustainability. The advantage of the GS approach is that it evaluates rapid growth that goes hand-in-hand with consuming, rather than with investing the revenues of unsustainable resource exploitation as negative (i.e. a negative value of GS). But a disadvantage of the approach is that it adopts a partial perspective with respect to time, as it neglects historical contexts. For instance, a country that has depleted all its natural resources can hardly score negative on genuine savings afterwards. At a more fundamental level, one can criticize the approach for assuming that changes in wealth or investment are a good proxy for changes in well-being and social welfare. However, there is no high and stable correlation between wealth and well-being or happiness, apart

from the relative income effect discussed earlier in Section 2.5.⁸ Against the background of the various criticisms of GDP in Section 2, however, the main shortcoming of the GS approach is that it mainly addresses the problem of capital depreciation (Section 2.7), and may partially cover valuation of informal activities (Section 2.6). Pillarisetti (2005) illustrates that GS is both conceptually and empirically an imperfect indicator for policy, regardless of whether it focuses on environmental sustainability or human well-being. Dasgupta (2001: Section 9.4) shows that neither can net national product (NNP) as the sum of consumption and GS serve as an indicator of welfare.

2.4 Composite indexes

A fourth and final type of indicator of social welfare is a composite index that combines indicators that are considered to capture relevant aspects of human well-being. Unlike the previous types of indicators, this does not generate a monetary value. The best-known example of this type is the Human Development Index (HDI) of the United Nations, which aggregates a number of indicators: GDP per capita (in PPP), life expectancy at birth, adult literacy rate, and combined primary, secondary, and tertiary gross enrolment ratios. The incorporation of GDP reflects, through a log-transformation and a maximum income limit, a decreasing marginal utility of income. This already means an improvement over GDP. Nevertheless, the HDI approach carries an element of arbitrariness, in the sense of selecting arbitrary components, as well as an arbitrary aggregation procedure. The latter generates normalized values for each component based on defined upper and lower bounds, and then calculates an arithmetic mean; this results in an index with a value between 0 and 1. Publications on the HDI argue that potential extensions of HDI with additional components are hampered by measurability problems. But income inequality is in any case measurable and clearly an important criterion for evaluating the position of, and changes in, developing countries. Moreover, it would in principle be feasible to develop quite objective indexes of political freedom⁹, time use (work, leisure, commuting), and available public health services. Not surprisingly then, various proposals have been done to extend or adjust the HDI, so as to address some of the omissions (e.g. Hicks, 1997; Noorbakhsh, 1998). In addition, other approaches to aggregate the components of the HDI are available, such as the Human Poverty Index (similar components as the HDI but differently weighted) and the Borda ranking. Dasgupta (2001: chapter 5) uses the latter procedure to extend, for illustrative purposes, the HDI with per capita private consumption and indexes of political and civil rights. In spite of its aforementioned deficiencies, the HDI is considered to be an improvement over GDP, especially for evaluating changes in developing countries. A main disadvantage of the HDI in comparison with the other indicators is a complete neglect of (environmental) sustainability. Dasgupta (2001, Section 5.8) notes that the HDI can be seen as “one-third intertemporal” because of the inclusion of adult literacy; but he adds the shortcoming that, although this

⁸ The World Bank has recently published *Where is the Wealth of Nations* (2006), which suggests that it regards wealth as important, but mainly as a basis for future welfare. In other words, wealth then serves as an indicator of potential future welfare.

⁹ In fact, the UN published a Human Freedom Index (HFI) in 1991 and a Political Freedom Index (PFI) in 1992 (Johansson, 2004).

reflects a capital asset, the HDI does not cover all relevant types of capital and is therefore inadequate to provide information useful for addressing intertemporal concerns. Neumayer (2001) proposes to combine the HDI and GS indicators to arrive at a more complete picture of sustainable development, notably of poor countries. He does, however, not arrive at a really integrated (composite) indicator.¹⁰ England (1998) offers a critical discussion of the HDI, arguing that it cannot capture relevant differences in welfare among the richest countries.¹¹

3. An overall assessment of the various indicators

Comparing the aforementioned alternative indicators of social welfare in light of the main points of criticism of GDP as noted in Section 2, it turns out that, at present, there is no perfect alternative available.¹² All available approaches are far from perfect and do not succeed in systematically repairing the list of shortcomings of GDP as a social welfare indicator noted in Section 2. In particular, the dynamic aspects, lexicographic preferences (basic needs), subjective well-being basis, and relative welfare and rivalry are neglected. Nevertheless, one can expect all of these alternatives to serve as a much better approximation of social welfare than GDP. ISEW (and GPI) is perhaps the most complete in that it tries to repair multiple shortcomings, as opposed to SNI and GS which focus on a more narrow set of shortcomings (notably related to the use of environment and natural resources). A disadvantage of ISEW, however, is that it is based on partial corrections without a consistent framework to identify indirect effects. Finally, all alternatives except HDI address environmental (capital) sustainability in one way or another, while ISEW and SNI adopt a strong and GS a weak sustainability perspective. HDI is the least attractive from a methodological viewpoint, and certainly unsuitable to subtly evaluate richer countries.

In conclusion, an ideal indicator of social welfare is not available. This would require an approach that takes its starting point in the findings of research on happiness and subjective well-being, but even this is unlikely to deliver the holy grail of a perfect, empirical indicator of social welfare. ISEW can be regarded as the most balanced alternative available right now, being a clear improvement over GDP. Still, if GDP would be, hypothetically, replaced by ISEW or another measure then there is a risk that growth fetishism –

¹⁰ Sen (2000: p.318, note 41) states: “Indeed, getting public attention has clearly been a part of UNDP’s objective, particularly in its attempt to combat the overconcentration on the simple measure of GNP per head, which often serves as the only indicator of which the public takes any notice. To compete with the GNP, there is a need for another – broader – measure with the same level of crudeness as the GNP. This need is partly met by the use of the HDI ...”. He adds that the HDI has attracted much more attention than often more informative, less aggregated information on diversity at the micro level.

¹¹ Pillarisetti and van den Bergh (2010, 2013) evaluate various other composite indexes that focus on environmental components, such as the ecological footprint, the Environmental Sustainability Index (ESI), the Sustainable Society Index, the Happy Planet Index, the Environmentally Responsible Happy Nations Index, the Responsibility–Capacity Index and the Sustainability Index by Fuzzy Evaluation. A comparison and correlation analysis shows that these various indicators do not provide a consistent picture and that their aggregation methods are subjective and debatable. Some of these indexes are very ambitious. For example, the ESI, developed by the Yale Centre for Environmental Law and Policy (Bisbort 2003; YCELP et al. 2005), uses 76 data sets (e.g., natural resource endowments, pollution levels, environmental management efforts, etc.) aggregated through 21 indicators.

i.e. striving for growth under all circumstances – will be directed at this alternative. Evidently, this would be undesirable if such a measure would still be far from perfect.

4. Conclusions

The replacing of GDP by a corrected GDP or another (either or not monetized) aggregate welfare indicator means effectively the elimination of GDP as such. There is no sign that the world is ready for this. An important lesson of this paper is that we should not wait to eliminate or substitute GDP by another measure until a perfect alternative welfare indicator is available. It is unlikely that a single indicator can be constructed to undo the long list of objections against GDP. It is, however, true that many well-thought alternative will represent a better approximation of social welfare than GDP. It would therefore be a good strategy to first strive towards less misleading information and parallel to this, or subsequently, magnify the amount of correct and useful information.¹³ This may lead to better choices in public decision-making and policy preparation (Layard, 2005), notably with regard to current pressing problems like the economic crisis and risks posed by climate change (van den Bergh, 2010).

For the moment, the ISEW and derived indicators seem to offer the best starting point in terms of the coverage of items that need correction. Nevertheless, their calculation methods should be much improved, notably to undo the partiality and inconsistency of corrections. Many suggestions for improving the ISEW approach have been offered which together provide a solid basis for a concerted effort to systematically and structurally develop ISEW indicator for all countries in the world, which would then offer a serious alternative to the GDP. The United Nations might pick this up as a concrete task, and in this way contribute to offer an acceptable aggregate (both national and global) indicator from both social and environmental perspectives.

In order to neutralize the critiques relating to lexicographical preferences, relative welfare, status and rivalry it seems inevitable that a basis is sought in the literature on subjective well-being and happiness (Kahneman et al., 2004). In particular, subjective indicators obtained from (international) studies and comparisons of happiness via surveys can form the basis for social welfare indicators.¹⁴ This would suggest a role for (economic) psychologists in indicator construction as well as macroeconomic policy preparation and advice.

Given the findings of the happiness literature, one should also be prepared to accept that welfare can reach a maximum, or that growth of welfare ultimately will tend to zero, and possibly for the rich countries in the world has already reached that point. Beyond any point of stable welfare, (costly) measurement of welfare aimed at assessing or discovering welfare improvements will then, of course, be futile. But this line

¹² Other alternatives are mentioned in the literature, but these have not proceeded beyond the stage of conceptualization. Bleyss (2006) offers an overview.

¹³ This is consistent with the “beyond GDP” idea: not replacing GDP but adding new, relevant macro-level indicators. See, for example, the advice by the Stiglitz-Sen-Fitoussi committee (http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf).

¹⁴ This is in line with the World Happiness Report (<http://unsdsn.org/happiness>).

of thought is probably still one step too far for economists trained with the thought that progress is never-ending (and well approximated by GDP per capita).

References

- Aronsson, T., P-O. Johansson and K-G. Löfgren (1997), *Welfare Measurement, Sustainability and "Green" Accounting: A Growth Theoretical Approach*. Edward Elgar, Cheltenham.
- Arrow, K.J. (1973). Some ordinalist-utilitarian notes on Rawl's Theory of Justice. *Journal of Philosophy* 70: 245-263.
- Arrow, K.J., B. Bolin, R. Costanza, P. Dasgupta, C. Folke, C. S. Holling, B. -O. Jansson, S. Levin, K.-G. Mäler, C. Perrings and D. Pimentel (1995). Economic growth, carrying capacity, and the environment. *Science* 268(April 28): 520-21.
- Asheim, G. (1994). Net national product as an indicator of sustainability. *Scandinavian Journal of Economics* 96: 257-265.
- Asheim, G. (2000). Green national accounting: why and how? *Environment and Development Economics* 5: 25-48.
- Atkinson, A.B. (1970). On the measurement of inequality. *Journal of Economic Theory* 2: 244-263.
- Atkinson, G. (1995). Measuring sustainable economic welfare: A critique of the UK ISEW. Working Paper GEC 95-08. Centre for Social and Economic Research on the Global Environment, Norwich and London.
- Ayres, R.U., J.C.J.M. van den Bergh and J.M. Gowdy (2001). Strong versus weak sustainability: economics, natural sciences and 'consilience' ", *Environmental Ethics*, Vol. 23 (1): 155-168.
- Beça, P., and R. Santos (2010). Measuring sustainable welfare: A new approach to the ISEW. *Ecological Economics* 69: 810-819.
- Bisbort, A. (2003). The environmental sustainability index: A new paradigm for global decision making. *Environment Yale Magazine: The Journal of the School of Forestry & Environmental Studies* 2(1): 3-11.
- Bleys, B. (2008). Proposed changes to the Index of Sustainable Economic Welfare: An application to Belgium. *Ecological Economics* 64: 741-751. Bolt, K., M. Matete and M. Clemens (2002). Manual for calculating adjusted net savings. Environment Department, World Bank, September 2002.
- Brennan, A.J. (2013). A critique of the perceived solid conceptual foundations of ISEW & GPI – Irving Fisher's cognisance of human-health capital in 'net psychic income'. *Ecological Economics* 88: 159-166.
- Daly, H.E. (1977). *Steady-State Economics*. W.H. Freeman, San Francisco.
- Daly, H.E., and J. Cobb (1989). *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future*. Beacon Press, Boston, MA.
- Dasgupta, P. (2001). *Human Well-Being and the Natural Environment*. Oxford University Press, Oxford.
- Dasgupta, P., and K.-G. Mäler (2000). Net national product, wealth, and social well-being. *Environment and Development Economics* 5(1-2): 69-93.
- de Groot, H.L.F., R. Nahujs and P.J.G. Tang (2004). Is the American model miss World? Choosing between the Anglo-Saxon model and a European-style alternative. CPB Discussion Paper 40, Centraal Planbureau, Den Haag.
- El Serafy, S. (2001). Steering the right compass: the quest for a better assessment of the national product. In: E.C. van Ierland, J. van der Straaten and H.R.J. Vollebergh (eds). *Economic Growth and Valuation of the Environment*. Edward Elgar, Cheltenham, UK, pp. 189–210.
- England, R.W. (1998). Measurement of social well-being: alternatives to gross domestic product. *Ecological Economics* 25: 89-103.
- Fleurbaey, M. (2009). Beyond GDP: The quest for a measure of social welfare. *Journal of Economic Literature* 47(4): 1029-1075. Galbraith, J.K. (1958). *The Affluent Society*. Houghton Mifflin Company, Boston.
- Gerlagh, R., R.B. Dellink, M.W. Hofkes and H. Verbruggen (2002). A measure of sustainable national income for the Netherlands. *Ecological Economics* 41: 157-174.
- Hamilton, K., and M.A. Clemens (1999). Genuine savings rates in developing countries. *World Bank Economic Review* 13(2): 333-356.
- Hartwick, J. (1977). Intergenerational equity and the investing of rents from exhaustible resources. *American Economic Review* 67: 972-974.
- Hartwick, J. M. (1990). Natural resources, national accounting and economic depreciation. *Journal of Public Economics* 43: 291-304.
- Hicks, D.A. (1997). The inequality-adjusted human development index: a constructive proposal. *World Development* 25: 1283-1298.
- Hicks, J.R. (1948). *Value and Capital* (2nd ed.), Clarendon Press, Oxford.
- Hirsch, F. (1976). *Social Limits to Growth*. Harvard University Press, Cambridge, MA.
- Hofkes, M., R. Gerlagh and V. Linderhof (2004). Sustainable National Income: A Trend Analysis for the Netherlands for 1990-2000. Report R-04/02, Institute for Environmental Studies, Free University, Amsterdam.
- Huetting, R. (1974). *Nieuwe Schaarste and Economische Groei*. Elsevier, Amsterdam. (English edition 1980, *New Scarcity and Economic Growth*, North-Holland, Amsterdam).

- Jackson, T., F. Laing, A. MacGillivray, N. Marks, J. Ralls and S. Stymne (1997). An index of sustainable economic welfare for the UK 1950–1996. Centre for Environmental Strategy, University of Surrey, Guildford.
- Johansson, C. (2004). The human development indices. Human Development Report Office, United Nations Development Programme, Presentation, Oxford, September 14 2004.
- Kahneman, D., A. Krueger, D. Schkade, N. Schwarz, A. and Stone (2004a). Toward national well-being accounts. *American Economic Review, Papers and Proceedings* 94: 429-434.
- Kubiszewski, I., R. Costanza, C. Franco, P. Lawn, J. Talberth, T. Jackson, C. Aylmer (2013). Beyond GDP: Measuring and achieving global genuine progress. *Ecological Economics* 93: 57-68.
- Kuznets, S. (1941). *National income and its composition 1919–1938*. National Bureau of Economic Research, New York.
- Lawn, P., and R. Sanders (1999). Has Australia surpassed its optimal macroeconomic scale: finding out with the aid of ‘benefit’ and ‘cost’ accounts and a sustainable net benefit index. *Ecological Economics* 28: 213–229.
- Lawn, P.A. (2003). A theoretical foundation to support the Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), and other related indexes. *Ecological Economics* 44(1): 105-118.
- Lawn, P. (2013). The failure of the ISEW and GPI to fully account for changes in human-health capital – A methodological shortcoming not a theoretical weakness. *Ecological Economics* 88: 167-177.
- Layard, R. (2005). *Happiness: Lessons from A New Science*. Penguin, London.
- Mishan, E.J. (1967). *The Cost of Economic Growth*. Staples Press, London.
- Neumayer, E. (2000). On the methodology of ISEW, GPI and related measures: Some constructive Comments and some doubt on the threshold hypothesis. *Ecological Economics* 34(3): 347-361.
- Neumayer, E. (2001). The Human Development Index and sustainability: A constructive proposal. *Ecological Economics* 39(1): 101-114.
- Noorbakhsh, F. (1998). A modified human development index. *World Development* 26: 517-528.
- Nordhaus, W.D. and J. Tobin (1972). Is growth obsolete? Economic Growth. 50th anniversary colloquium V. Columbia University Press for the National Bureau of Economic Research. New York. Reprinted in: Milton Moss (ed.), *The Measurement of Economic and Social Performance*, Studies in Income and Wealth, Vol. 38, National Bureau of Economic Research, 1973.
- OECD (2006). *Going for Growth*. OECD, Paris.
- Pillarisetti, J.R. (2005). The World Bank’s ‘genuine savings’ measure and sustainability. *Ecological Economics* 55: 599-609.
- Pillarisetti, J.R., and J.C.J.M. van den Bergh (2010). Sustainable nations: What do aggregate indexes tell us? *Environment, Development and Sustainability* 12(1): 49-62.
- Pillarisetti, J.R., and J.C.J.M. van den Bergh (2013). Aggregate indices for identifying environmentally responsible nations: an empirical analysis and comparison. *International Journal of Environmental Studies* 70(1): 140-150.
- Rawls, J. (1972). *A Theory of Justice*. Clarendon Press, Oxford.
- Samuelson, P.A. (1961). The evaluation of social income: capital formation and wealth. In: F. Lutz and D. Hague (eds). *The Theory of Capital*. St. Martin’s Press, New York.
- Scitovsky, T. (1976). *The Joyless Economy*. Oxford University Press, New York.
- Sen, A. (1976). Real national income. *Review of Economic Studies* 43(1): 19-39.
- Sen, A. (2000). *Development as Freedom*. Oxford University Press, Oxford.
- Solow, R.M. (1974). Intergenerational equity and exhaustible resources. *Review of Economic Studies* (symposium)41: 29-45.
- Tinbergen, J., and R. Huetting (1992). GNP and market prices: wrong signals for sustainable economic success that mask environmental destruction. In: R. Goodland, H. Daly and S. El Serafy (eds). *Population, Technology and Lifestyle: The Transition to Sustainability*. Island Press, Washington D.C.
- van den Bergh, J.C.J.M. (2009). The GDP Paradox. *Journal of Economic Psychology* 30(2): 117–135.
- van den Bergh, J.C.J.M. (2010). Relax about GDP growth: Implications for climate and crisis policies. *Journal of Cleaner Production* 18(6): 540-543.
- Vellinga, N., and C. Withagen (1996). On the concept of green national income. *Oxford Economic Papers* 49(4): 499-514.
- Victor, P.A. (2010). Ecological economics and economic growth. *Ecological Economics Reviews, Annals of the New York Academy of Sciences* 1185: 237-245.
- Weitzman, M.L., and K.-G. Löfgren (1997). On the welfare significance of green accounting as taught by parable. *Journal of Environmental Economics and Management* 32: 139-153.
- Weitzman, M.L. (1976). On the welfare significance of national product in a dynamic economy. *Quarterly Journal of Economics* 90: 156-162.
- World Bank (2006). *Where is the Wealth of Nations*. The World Bank, Washington D.C.
- YCELP (2005). 2005 environmental sustainability index. Yale Centre for Environmental Law and Policy (YCELP), Center for International Earth Science Information Network, and The World Economic Forum, YCELP, NewHaven.



The research leading to these results has received funding from the European Community's Seventh Framework Programme FP7/2007-2013 under grant agreement n 290647.



Project Information

Welfare, Wealth and Work for Europe

A European research consortium is working on the analytical foundations for a socio-ecological transition

Abstract

Europe needs change. The financial crisis has exposed long neglected deficiencies in the present growth path, most visibly in the areas of unemployment and public debt. At the same time, Europe has to cope with new challenges ranging from globalisation and demographic shifts to new technologies and ecological issues. Under the title of Welfare, Wealth and Work for Europe – WWWforEurope – a European research consortium is laying the analytical foundations for a new development strategy that enables a socio-ecological transition to high levels of employment, social inclusion, gender equity and environmental sustainability. The four year research project within the 7th Framework Programme funded by the European Commission was launched in April 2012. The consortium brings together researchers from 33 scientific institutions in 12 European countries and is coordinated by the Austrian Institute of Economic Research (WIFO). The project coordinator is Karl Aiginger, director of WIFO.

For details on WWWforEurope see: www.foreurope.eu

Contact for information

Kristin Smeral

WWWforEurope – Project Management Office
WIFO – Austrian Institute of Economic Research
Arsenal, Objekt 20
1030 Vienna

wwwforeurope-office@wifo.ac.at

T: +43 1 7982601 332

Domenico Rossetti di Valdalbero

DG Research and Innovation
European Commission

Domenico.Rossetti-di-Valdalbero@ec.europa.eu

Partners

| | | | |
|--|---|--------------------|----------------|
| | Austrian Institute of Economic Research | WIFO | Austria |
| | Budapest Institute | Budapest Institute | Hungary |
| | Nice Sophia Antipolis University | UNS | France |
| | Ecologic Institute | Ecologic | Germany |
| | University of Applied Sciences Jena | FH Jena | Germany |
| | Free University of Bozen/Bolzano | FUB | Italy |
| | Institute for Financial and Regional Analyses | GEFRA | Germany |
| | Goethe University Frankfurt | GUF | Germany |
| | ICLEI - Local Governments for Sustainability | ICLEI | Germany |
| | Institute of Economic Research Slovak Academy of Sciences | IER SAVBA | Slovakia |
| | Kiel Institute of the World Economy | IfW | Germany |
| | Institute of World Economics, RCERS, HAS | KRTK MTA | Hungary |
| | KU Leuven | KUL | Belgium |
| | Mendel University in Brno | MUAF | Czech Republic |
| | Austrian Institute for Regional Studies and Spatial Planning | OIRG | Austria |
| | Policy Network | policy network | United Kingdom |
| | Ratio | Ratio | Sweden |
| | University of Surrey | SURREY | United Kingdom |
| | Vienna University of Technology | TU WIEN | Austria |
| | Universitat Autònoma de Barcelona | UAB | Spain |
| | Humboldt-Universität zu Berlin | UBER | Germany |
| | University of Economics in Bratislava | UEB | Slovakia |
| | Hasselt University | UHASSELT | Belgium |
| | Alpen-Adria-Universität Klagenfurt | UNI-KLU | Austria |
| | University of Dundee | UNIVDUN | United Kingdom |
| | Università Politecnica delle Marche | UNIVPM | Italy |
| | University of Birmingham | UOB | United Kingdom |
| | University of Pannonia | UP | Hungary |
| | Utrecht University | UU | Netherlands |
| | WU - Vienna University of Economics and Business | WU | Austria |
| | Centre for European Economic Research | ZEW | Germany |
| | Coventry University | COVUNI | United Kingdom |
| | Ivory Tower | IVO | Sweden |