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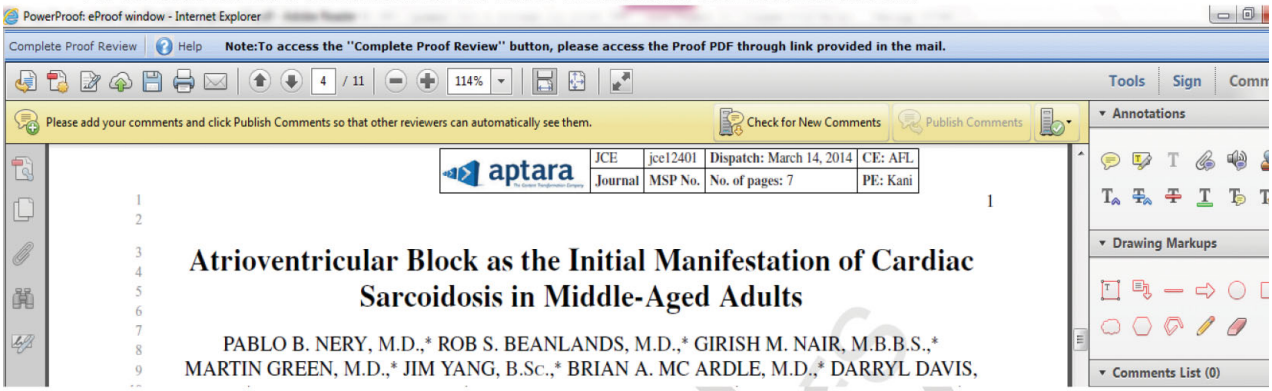

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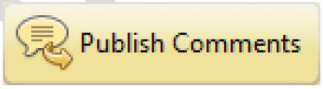

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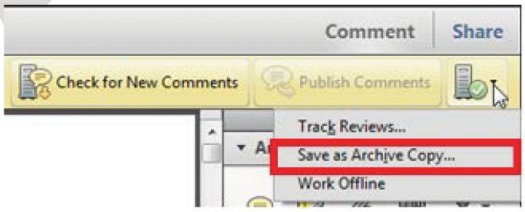

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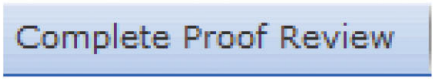

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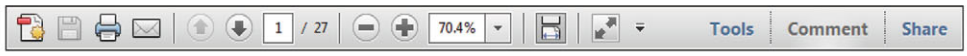

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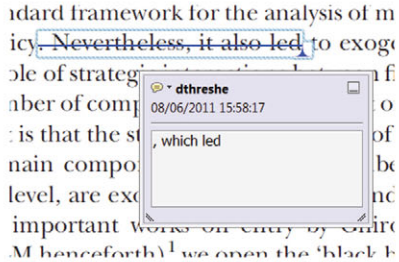

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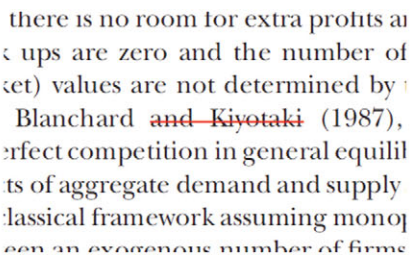

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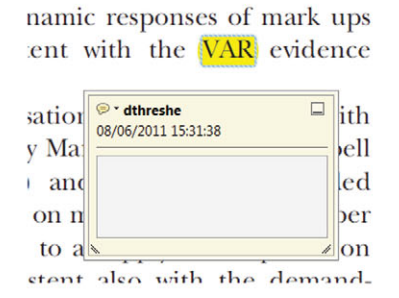

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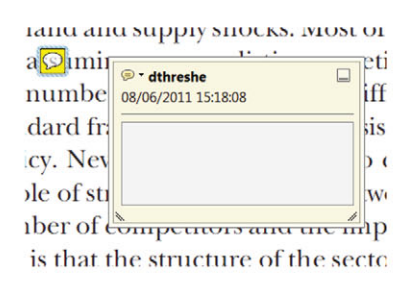

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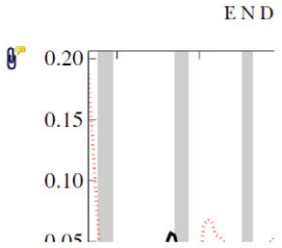

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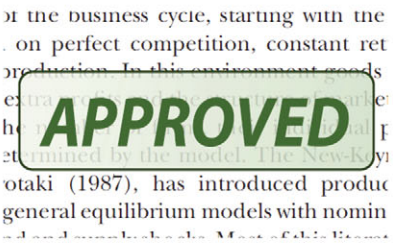

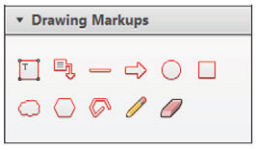

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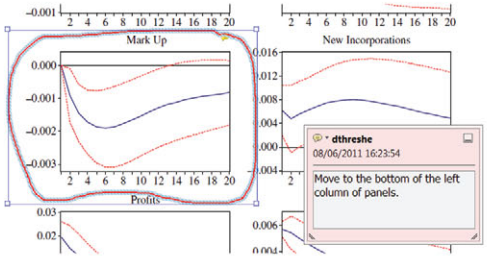

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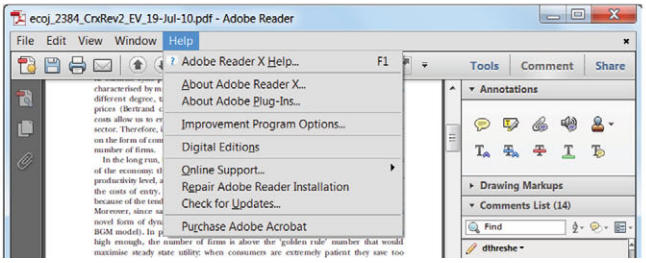

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The Misty Grail: The Search for a Comprehensive Measure of Development and the Reasons for GDP Primacy

Q1 Emanuele Felice

ABSTRACT

Recent decades have seen a flurry of new indicators to measure economic progress, but none of them has succeeded in replacing GDP. This article seeks to explain this outcome and to contribute to the debate about composite indicators versus a dashboard approach. To this end, it reviews some of the most popular alternatives to GDP (the Human Development Index, the Genuine Progress Indicator, the Happy Planet Index, and an environmentally corrected GDP), focusing on their conceptual foundations rather than on their statistical consistency as most of the literature does. It is shown that most of these measures are theoretically inconsistent; the exception is the environmentally corrected GDP, but since this too has failed to replace GDP, inconsistency must be only one reason behind the limited use of alternative measures. The author argues that the main reason for GDP's primacy is that GDP is better suited to reflect the goals of capitalist market economies. This implies that constructing composite indicators as alternatives to GDP will be pointless as long as the current preference system has not changed to include environmental or social goals. The author also suggests that for this purpose a dashboard approach, which provides different social groups with intelligible quantitative instruments, may be preferable to the use of composite indicators.

INTRODUCTION

The body of literature about Gross Domestic Product (GDP) and its limits has reached massive proportions, and has resonance at both the institutional and the policy-making levels (Radermacher, 2015; Stiglitz et al., 2009; Tavernier et al., 2015). Many alternative measures have been proposed and, although some of them — namely the Human Development Index (HDI), the Genuine

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Progress Indicator (GPI) and the Happy Planet Index (HPI) — have attained renown, at the present none has succeeded in replacing the long-standing primacy of GDP per capita. In public media discourse, political debate, economics teaching at all levels, and academic journals, GDP continues to be the prime indicator of economic success, its increase still being the main goal of economic policy (e.g. van den Bergh, 2009: 118).[1] To quote Diane Coyle: 'GDP is [still] the way we measure and compare how well or badly countries are doing' (Coyle, 2014: 4).[2]

While it is widely acknowledged that GDP fails to properly track crucial dimensions of development, from environmental to social goals, there is acceptance that, for GDP, the choice of components series and their aggregation function are at least constrained by a consistent economic theory. This is not the case for alternative composite indicators, which have come to be dubbed 'mashup indices' by their critics (Ravallion, 2012a). Not discouraged by this disapproval, the advocates of composite indicators have made progress in developing a highly refined body of computational techniques, including pre-computation multivariate and post-computation sensitive analyses, in order to make multi-criteria evaluation flexible enough to adapt to different social environments and policy goals.[3] And yet the big questions still loom. What is the value of highly elaborate composite indicators for policy makers and for the society? Does their increasing complexity go to the detriment of their clarity? If this is the case, should we consider the search for a comprehensive measure of development — an indicator which would be, at the same time, more inclusive than GDP, theoretically consistent, and comparable across periods and countries — as a sort of 'misty' grail, that is, an unattainable goal which in the end confounds both researcher and policy maker? And as a consequence, wouldn't the alternative dashboard of multiple indices approach, which monitors each component separately, be preferable?[4]

In order to address these questions, we should, first, understand why the most popular alternative composite indices have failed to replace GDP thus far. Second, from such an acknowledgment we should draw lessons on how to replace, or even only to improve, GDP, bearing in mind that the advantages

1. A partial (anecdotal, but eloquent) confirmation of this comes from browsing through the main daily and weekly economics publications, such as *The Financial Times*, *The Wall Street Journal* and *The Economist*.
2. See Coyle (2014: 1–6) for another example in support of this argument: the role played by GDP statistics in the 2009–14 Greek (and euro) crisis.
3. For a useful introduction, see Munda (2015); OECD/JCR (2008). See also: Munda (2004) for the importance of the social, political and technical structuring process in the computation scheme and the argument of context-dependent weights, which should be intended as importance coefficients and not as trade-off; Munda (2005) for the development of a multi-criterion framework to measure sustainability; and Munda and Nardo (2009) for mathematical modelling
4. A similar case is made by Ravallion (2011) with reference to poverty monitoring.

of composite indicators versus simple ones should not be considered only in abstract terms (as if economics was a theoretical science, whose postulates and results could be superimposed upon the actual structure of a given society), but primarily with reference to the social actors who draw policy guidance from these measures.

This article aims to make significant progress on both these issues. It pursues that goal through a number of logical steps. First, it reviews what are arguably the most popular alternatives to GDP — the Human Development Index, the Genuine Progress Indicator, the Happy Planet Index, and an environment-augmented GDP — by focusing on their conceptual foundations (the capability approach, utilitarism, the wealth approach, or a mix of these), rather than on their statistical consistency, as most of the literature does. Any composite indicator aiming to measure progress or well-being should weigh up different 'dimensions' according to a consistent theoretical definition of progress or well-being; this article shows that, in the most popular alternatives to GDP, the aggregation function and/or the single dimensions are either faulty (Genuine Progress Indicator, Happy Planet Index), or inconsistent with the aims and declared goals of the index (Human Development Index). Of course criticisms of these measures, and particularly of HDI, are not new, but they have tended to concentrate on the statistical consistency and calibration of the indices, or on the accuracy and value of their single dimensions. By contrast, this article argues that the conceptual foundations behind these composite indicators have been relatively overlooked,[5] with serious implications: some of the new 'improved' indices, although mathematically more refined, are less conceptually consistent — with paradoxical results in terms of policy indications (Ravallion, 2012b). The case of HDI is emblematic; although less popular, GPI and HPI share similar flaws.

The conceptual foundations of GDP are essentially the 'wealth' or 'income' approach, where wealth is used in a very strict sense (monetary wealth). The alternative indices are based either on the capabilities approach (the HDI), or on an unclear and highly subjective combination of utilitarian and wealth theories (GPI, HPI). As a second step, therefore, this article argues that the monetary wealth approach is more suited for use in an index. Unlike capabilities or utilities, wealth — or its periodical flow, income — can be measured with a reasonable degree of accuracy, provided that we accept prices as an unbiased instrument to measure value (which is not unchallenged; nonetheless, it is the standard of our capitalist market economies). The third step shows that an environment-augmented GDP would not be theoretically inconsistent with the wealth approach; indeed, more generally, the wealth approach can be extended to include non-market components

5. In OECD/JCR (2008) out of 158 pages only one (p. 22) is dedicated to warning against possible inconsistencies in the theoretical framework. Slightly less concise is the discussion in Ravallion (2012a: 6–8).

reflecting well-being and environment, following a literature dating back to the 1970s and 1980s. It would therefore be possible to have indices of economic progress which are conceptually consistent and, at the same time, more inclusive than GDP.

To date, however, none of these alternatives has been successful. As a fourth and final step, the article surmises from this that philosophical consistency is only an apparent reason behind the enduring primacy of GDP: the higher 'social suitability' of GDP could be at least as important, as long as maximizing monetary wealth (through producing goods and services to be sold in the market) is the prevailing goal of the current capitalist market economies (e.g. Hamilton, 2003).

Finally, then, the article concludes that, even though the wealth approach can be extended to include some social and ecological dimensions without losing the basics of its 'objectivity', it is unlikely that an improved GDP will ever succeed unless the prevailing goals of a society are modified to allow for dimensions which are not currently exchanged in the market. In the meantime, society will endure as a complex living fabric, an open field where different actors struggle to affirm their views and interests, and economists intervene in the public sphere in an effort to provide the most suitable representation of human welfare (Eyal and Levy, 2013). In such a confrontation, a dashboard approach which endows each social group with its own evaluation instruments has advantages over composite indicators, in which preferences and thus trade-offs are either hidden and ultimately unclear, or based upon implicit weights around which there is no established consensus.

ALTERNATIVES TO GDP

From Capabilities to the Human Development Index: A Failure Story?

The Human Development Index (HDI) was introduced in 1990 by the United Nations Development Programme in its first annual Human Development Report (HDR) (UNDP, 1990). Through the years, it rapidly gained in popularity; it is now the most successful alternative to GDP and the annual release of the HDI report attracts much attention. Furthermore, it has established itself as an independent measure, with significant appeal in development studies (as the increasing number of scientific papers devoted to it attests).[6]

The conceptual foundations of HDI are to be found in Sen's capabilities approach to welfare economics (Sen, 1985). Functional capabilities are

6. HDI is the only alternative measure which has a firm place in the field of economic history: see Crafts (1997, 2002) and Prados de la Escosura (2010, 2013, 2015) for cross-country long-run comparisons, and Felice and Vasta (2015) for a historical reconstruction at the regional level.

substantive freedoms that people have reason to value: for instance, the ability to live a long and healthy life (longevity); the ability to decide about one's own future, assured by an adequate education; the ability to engage in economic transactions and to satisfy material needs (resources). Accordingly, poverty is understood as capability deprivation. Thus illiteracy, ill health, lack of access to resources, must be considered obstacles to what an individual can do in her/his life: human development consists of removing these obstacles (Sen and Anand, 1990).

Initially Sen was sceptical about the possibility of synthesizing the complexity of the human capabilities approach into one single index. Pakistani economist Mahbub ul Haq — in S[illegible] words 'the originator of the Human Development Report' — succeeded in persuading him that a single indicator was necessary as an alternative to GDP: it would shift the attention of policy makers, and hopefully of a larger public opinion, from maximizing income to maximizing welfare, that is, from national income accounting to people-centred policies. In other words, HDI was devised for a practical purpose. While it has had some success as an alternative to GDP, it has failed as an instrument for policy makers, as we will see below. Ongoing refinements have also caused it to drift further away from the original capability approach.

Consistent with the capability approach, the three basic components of human life were recognized to be longevity, education and resources; these were computed in terms of deprivation, according to the formula:

$$I_{ij} = \frac{\left(\max_j X_{ij} - X_{ij}\right)}{\left(\max_j X_{ij} - \min_j X_{ij}\right)}; \tag{1}$$

where I_{ij} is the deprivation indicator [illegible] the jth country with respect to the ith variable. The three basic variables were Life expectancy (X_1) for longevity, adult literacy rate (X_2) for education, and the ln of real per capita GDP (X_3) for resources, whereas maximum and minimum values were determined from the actual values of the current sample.[7] The average deprivation indicator was thus determined as the arithmetic mean of the three deprivation indicators:

$$I_j = \frac{\sum_{i=1}^{3} I_{ij}}{3}; \tag{2}$$

from which HDI was 1 minus the average deprivation index (UNDP, 1990: 109):

$$(HDI)_j = (1 - I_j) \tag{3}$$

7. In 1990 these were: 78.4 and 41.8 for life expectancy; 100.0 and 12.3 for adult literacy rate; 3.68 and 2.34 for real GDP per capita (log).

This measure was straightforward, and appealing. The only serious arbitrariness was the use of a log transformation for resources: it was derived from the reasonable premise of diminishing returns from income to human development, and calculated following the well-known Atkinson formulation for the utility of income (Atkinson, 1970), in the presence of diminishing returns (UNDP, 1992: 91).

As early as the second HDR, however, the formula for the education component had changed into an average of two-thirds literacy and one-third mean years of schooling (UNDP, 1991: 88–9). Now, both the weights and the new indicator (mean years of schooling) looked somehow arbitrary. For mean years of schooling, it is unclear why every year of schooling was counted equal, in each country and between countries (regardless of intra-country and cross-country differences in school systems), and, above all, why the same relationship between years of schooling and the capability of deciding about one's own future was assumed for each year and each country (i.e., why quantitative differences in the years of schooling, above the literacy threshold, should proxy the capability of deciding about one's own future). These questions remain unanswered; they have passed unnoticed in the literature, which too easily overlooks the fact that the capability approach is expressed in terms of deprivation and its bearing on the measures to be chosen and their use.

The next shift in the HDR was to move from empirical to theoretical thresholds: from 1994 onwards, these were somehow arbitrarily decided for life expectancy (85 and 25 years), income (purchasing power parity [PPP] US$ 40,000 and US$ 200), and mean years of schooling (15 and 0 years); only adult literacy was left unchanged, ranging from 0 per cent to 100 per cent (UNDP, 1994: 108). Then, by 1995, mean years of schooling (a stock measure just like the adult literacy ratio) were substituted by combined primary, secondary and tertiary enrolment ratios (a flow measure), ranging from 0 per cent to 100 per cent (UNDP, 1995: 134). This was one more step away from the capability approach, which further increased the arbitrariness of the education component, not least because enrolment ratios are flow measures referring to only a part of the population (unlike literacy and mean years of schooling, which are stock measures referring to the whole population). What is worse, in the 1995 HDR there is no justification at all for this change — and the critical literature has overlooked this too.

It is now time to turn to this literature. Along with great interest, HDI has also received widespread criticism, from McGillivray (1991) onwards. Broadly speaking, these criticisms fall into three categories, not necessarily mutually exclusive: a) those who reject some or all of the components of the HDI (and the related conceptual framework) and, in some cases, propose new and alternative indices, such as the Genuine Progress Indicator (Cobb and Cobb, 1994); b) those who accept the basic components of the HDI and its conceptual foundations, but add new dimensions, such as political freedom, inequality, pollution; c) those who concentrate on the way the

three components are measured and computed. In just a handful of years, this literature mushroomed, so that only the most relevant contributions can be discussed here. While point a) will be developed further below, the first focus here is on the criticisms falling under points b) and c).

Regarding point b), further developments have considerably extended the number of basic capabilities, with decisive contributions by Amartya Sen and Sudhir Anand on sustainability and environment (Sen and Anand, 1994a, 1994b), gender equality (Sen and Anand, 1995), human poverty (Sen and Anand, 1997), and human rights (Sen and Anand, 2000), as well as by Martha Nussbaum (2000), who increased the number of basic capabilities to ten.[8] As a consequence, the HDRs have been enriched by incorporating new indicators (for a synthesis, see Fukuda-Parr, 2003: 303). However, these indicators were computed and discussed as qualifications to the HDI, whose basic composition was not changed, at least in the HDRs. This resulted in a sort of hierarchy among human capabilities which, once again, had no theoretical foundations: why were some capabilities (longevity, education, resources) computed in a synthetic index, with trade-off implications for the policy maker, while others were treated separately? This question also remains unanswered in the HDRs. At the same time, other authors have proposed new indices incorporating new or different capabilities: the literature grew as a forest around a tree, and yet still without incorporating the total range of capabilities (as developed for instance by Nussbaum), and often with remarkably fragile theoretical and mathematical foundations. The factory of (redundant) composite indicators has been working hard, its links with the capability approach becoming increasingly feeble.

With regard to point c), various 'improvements' to the HDI have been proposed, aiming to overcome one or another shortcoming of the previous formulas. Following Kakwani (1993), Leandro Prados de la Escosura (2010) presented an 'improved' HDI, along with historical estimates spanning more than a century. The main novelties are the use of a convex achievement function for the social components (longevity and education), which assigns higher values (higher achievement) to improvement at the higher levels, and the use of a geometric average, rather than an arithmetic one, to reduce substitutability among the index components (in other words, the index performs better when all three components perform better, and a decrease in one component is hardly compensated by an increase in another).[9] Not everyone agrees with these changes, however. Tsui (1996) has challenged

8. These are: 1) life; 2) bodily health; 3) bodily integrity; 4) sense, imagination and thought; 5) emotion; 6) practical reason; 7) affiliation; 8) other species; 9) play; 10) control over one's environment (Nussbaum, 2000).
9. 'The final outcome is a new human development index which, by not concealing the gap between rich and poor countries, casts a much less optimistic view than the one provided by conventional UNDP index while satisfying the HDR concern for international differences' (Prados de la Escosura, 2010: 842). Some minor changes were also introduced in the maximum and minimum thresholds. More recently, Prados de la Escosura (2015) has

the assumption of a convex achievement function (and thus of increasing returns) for the social components; Noorbakhsh (1998) has proposed to extend to education the assumption of diminishing returns.

In the 2010 HDR (UNDP, 2010) the UNDP accepted some of the above criticisms and made a considerable effort to improve the index. The three HDI components were measured as follows:

$$new\left(1 - I_{ij}\right) = \frac{\left(X_{ij} - \min_{j} X_{ij}\right)}{\left(\max_{j} X_{ij} - \min_{j} X_{ij}\right)}. \quad (4)$$

For longevity (X_1), which is still proxied through the Life expectancy index (LeI), the minimum threshold is theoretical (20 years), while the maximum (83.2) is empirical (the maximum value observed in the sample, Japan in 2010). Education (X_2) is proxied through an Education index (EI), which is an equal-weighted geometric average of the Mean years of schooling index (MYSI), measured as the mean years of schooling divided by 13.2 (the maximum value observed in the sample, USA in 2000; the minimum equals zero), and the Expected years of schooling index (EYSI), measured as the expected years of schooling divided by 20.6 (the maximum value observed in the sample, Australia in 2002; the minimum equals zero); EI is then proportioned on a maximum of 0.951, the maximum value of the combined Education index observed in the sample (New Zealand in 2010), and a minimum of 0. For resources (X_3), measured through the Income index (II), (ln of) Gross National Income, expressed in 2008 US$ PPP, is used instead of (ln of) Gross Domestic Product, (ln of) 108,211 and (ln of) 163 being respectively the maximum (United Arab Emirates in 1980) and minimum (Zimbabwe in 2008) values observed in the sample.[10] The three components are then weighted through a geometric mean, according to the formula:[11]

$$\left(new\,HDI\right)_j = \sqrt[3]{\prod_{i=1}^{3} new\left(1 - I_{ij}\right)}. \quad (5)$$

proposed a 'historical' HDI, with some changes to allow for more consistent long-run comparisons.

10. GNI appears more appropriate, since it captures the income from national citizens living abroad, namely the remittances from emigrants, while excluding the income produced within the country which goes to foreign citizens.
11. In the 2010 HDR, the new HDI is estimated for benchmark years from 1980 up to 2010. The report also presents an inequality adjusted Human Development Index (IHDI), which is a geometric mean of geometric means, each one computed by discounting each dimension's average value according to its level of inequality, based on a distribution-sensitive class of composite indices.

To sum up, the three main innovations are: a) the use of a geometric mean to weight the three components, which reduces substitutability among them and was employed in the improved HDI; b) the return to empirical (rather than theoretical) thresholds; and c) a remarkable refinement of the Education indicator, together with some refinement of the Income indicator.[12] At first glance, this new index represents a considerable advance upon the old one. A more in-depth analysis reveals remarkable inconsistencies with both the capability approach and the proposed goals of economic policy. For the education indicator, for example, the last refinement represents a further step away from a measure consistent with the capability approach: literacy was, after all, the only indicator easily understandable in terms of capabilities, and it is now abandoned.[13] Again, this has been overlooked by a critical literature not interested in the theoretical foundations of the index. However, the biggest inconsistency probably lies elsewhere. As pointed out by Ravallion, after the introduction of the geometric mean, trade-offs between the single components became troubling:

> Longevity in poor countries has been substantially devalued, though it seems unlikely that this was intended. The HDI's valuation of longevity in the poorest country is now a mere 0.006% of its value in the richest country — a far greater difference than in their average incomes (for which the poorest country has 0.2% of the national income per capita of the richest). A poor country experiencing falling life expectancy due to (say) a collapse in its already weak health-care system could still see its HDI improve with even a small rate of economic growth. By contrast, the valuations of extra schooling have risen for most countries and they seem high — some four times higher than the valuations typically placed by the labor market on extra schooling. (Ravallion, 2012b: 208)

Ravallion holds that these 'troubling trade-offs' could have been largely avoided by using some alternative specifications of Chakravarty's 'generalized old HDI' formula, together with replacing Ln GDP with GDP in the Income index and with using the arithmetic mean for the two schooling variables. Given the formula from Chakravarty (2003):

$$\mathrm{HDI}^c = [f(\mathrm{LeI}) + f(\mathrm{EI}) + f(II)]/3 \tag{6}$$

12. From the possible innovations, the proposal to use a convex function rather than linear transformation for the non-income components was not well received, since it was considered inconsistent with the capability approach. For example, at a late age a further increase in life expectancy should not result in a more than proportionally greater capability of living a long and healthy life. Indeed, in the case of income, following Sen and Anand (2000), it was reasserted that the concave form of the transformation function was more in line with the capability approach.
13. One could argue that holding an educational certificate (degree, PhD, etc.) increases the chances of deciding about one's own future. Following this reasoning, counting and classifying educational certificates would be more consistent with the capabilities approach than counting the years of schooling. Of course, mean years of schooling can be considered a good proxy for per capita certificates, but why use the proxy if we can have direct data? Issues like these have never been raised in the debate about HDI, suggesting once more that this debate has not been concerned with the theoretical foundations of the index, nor with the consistency between theory and technicalities.

Ravallion proposes two special cases of $f(I_x) = I^r{}_x$, for $(0 < r < 1)$ (the old HDI is the limiting case when $r = 1$, with perfect substitutability), when $r = 0.5$ and 0.25. These coefficients maintain some imperfect substitutability and have inter-component trade-offs more in line with the declared goal of the index. These coefficients, too, are somehow arbitrary as they are the resulting trade-offs. Furthermore, Ravallion himself does not provide any guide to distinguish between the virtually unlimited possible values of r, although he shows some preference for a 0.5 value.[14]

Thus far the UNDP has not taken Ravallion's criticism on board. In the latest HDRs we observe some changes, but confined to the thresholds values. As early as 2011, theoretical rather than empirical thresholds were introduced for the maximum value of the Expected years of schooling (capped at 18.0), and for the minimum value of GNI (ln of 100 US$ PPP) (UNDP, 2011: 168). In the 2014 report, all the thresholds are theoretical ones: the maximum and minimum values are, respectively, 85 and 20 for the Life expectancy index, 18 and 0 for the Expected years of schooling index, 15 and 0 for the Mean years of schooling index, (ln of) 35,000 and 100 PPP 2011 US$ for the Income index. What are the reasons for these changes, and how have the new values been selected? Is there a coherence? In the 2014 HDR, the maximum and minimum values are presented as 'aspiration goals' and 'natural zeroes', respectively (UNDP, 2014: 2), but no unified or consistent criterion is introduced. For instance, the 15 maximum for the Mean years of schooling index has been chosen because '15 is the projected maximum of this indicator for 2025' (ibid.): why chose 2025? The maximum of the Expected years of schooling follows a different criterion: 18 is said to be 'equivalent to achieving a master's degree in most countries' (ibid.). This makes sense in terms of deprivation and the capability approach, but should have been applied, with more reason, to the mean years of schooling, that is to the stock measure and not only to the flow measure (as mentioned, flow measures are less reconcilable with deprivation). The maximum threshold chosen for the Income index could also make sense in terms of capabilities, but it needs to be based on broader and more comparative research (and to be consistently updated). At present, the maximum value for the Income

14. On the trade-offs between GDP per capita and life expectancy, there is a literature dating back to the 1970s, which follows the utilitarian approach. Usher (1973), for instance, proposed to assign to life expectancy a weight inversely proportional to a parameter, β, which is assumed to be the elasticity of annual utility with respect to consumption; however, there is no consensus about the value of β, which could range from 0.25 to 0.45, and of course these changes in β can have a significant impact on the final index (for a recent example, based on the Italian case, see Brandolini and Vecchi, 2013). More recently, Jones and Klenow (2010) have proposed a money metric of social welfare based on expected utilities, which adjusts consumption per person, at PPP, to allow for differences in longevity, leisure and inequality; this method too requires the specification ex-ante of a utility function, being consistent with the utilitarian approach and thus subject to the same criticisms: arbitrariness in assigning objective values (and weights) to subjective preferences.

index comes from the fact that 'Kahneman and Deaton (2010) have shown that there is a virtually no gain in human development and well-being from annual income beyond $75,000' (ibid.). Apart from the minor point that this work is based on 2008 and 2009 prices, while 2011 prices are used for the new index, the conclusions by Kahneman and Deaton (2010) result from an inquiry carried out on US residents only: by accepting them, we are assuming that the US relationship between well-being and income is the one we should take as being the norm — or even as an 'aspirational goal' — throughout the world. Finally, a mystery remains why 85 has been chosen as the maximum threshold for life expectancy: is there a well-being criterion too, as for income, or is 85 a projection, as for the mean years of schooling? Or is it just a figure which makes sense for the present? No guide at all is provided for this in the 2014 HDR.

It is worth remembering that these latest changes in the thresholds, while adding inconsistencies to the final index, still ignore the problem of troubling trade-offs raised by Ravallion (arguably the most serious problem in terms of economic policy). They also represent a detachment from the original theoretical foundations of the index and thus a certain sense of arbitrariness in the way this measure is constructed. The HDI was introduced to give policy makers 'one simple number' through which to devise and assess more people-centred policies. After more than two decades of debates and 'refinements', the result seems to be either a number which would favour *less* people-centred policies (the new HDI) or an unlimited amount of alternatives, i.e. too many numbers which, of course, means no number at all.

Mixed Foundations: The Genuine Progress Indicator and the Happy Planet Index

Other alternative measures of economic performance can be subject to criticisms similar to those levelled at HDI. It is impossible to review all of these indices, whose number is still growing;[15] this section focuses on two of the most popular ones, which have very different theoretical foundations. They are the Genuine Progress Indicator (GPI) — a 'green' GDP — and the Happy Planet Index (HPI). Both have gained some success at the institutional level: the Chinese and Indian governments have adopted a 'green' GDP accounting system (Financial Express Bureau, 2009), while the conservative Prime Minister of the UK at the time, David Cameron, expressed support for HPI (Parker, 2007). They are not, of course, the only measures of some interest to the scientific community.[16] Unlike others, however, GPI (and the green

15. For a useful overview, see Schepelmann et al. (2010).
16. In 2010, the UK Office for National Statistics launched the Measuring National Well-Being programme, which pursues a wider framework (with many more measures than the HPI) and

accounting from which it stems) has begun to establish itself as an independent instrument with significant appeal in environmental studies. This is less true of the HPI; however, HPI has the practical advantage of being estimated for almost all the countries of the world, thus allowing for comparisons with GDP and HDI (as we will see below).

Unlike GDP, GPI is a measure of economic growth which aims to distinguish between good and bad growth. Its foundations date back to a seminal work of Daly and Cobb (1989) and are similar to those of the Index of Sustainable Economic Welfare (ISEW) and other 'green' GDP accounting systems. 'While methodologies are somewhat different — as synthesized in the GPI 2006 report — the ISEW, GPI, and other green GDP accounting systems all involve three basic steps' (Talberth et al., 2007: 3). First are estimates of personal consumption expenditures, 'which are weighted by an index of the inequality in the distribution of income to reflect the social costs of inequality and diminishing returns to income received by the wealthy' (ibid.). The second step consists of a number of additions, 'made to account for the non-market benefits associated with volunteer time, housework, parenting, and other socially productive time uses as well as services from both household capital and public infrastructure' (ibid.). The third step consists of deductions, 'to account for purely defensive expenditures such as pollution related costs or the costs of automobile accidents as well as costs that reflect the undesirable side effects of economic progress' (ibid.). Other kind of deductions, 'for costs associated with degradation and depletion of natural capital incurred by existing and future generations' (ibid.) are also made at this stage (see also Neumayer, 2000; Stockhammer et al., 1997). In more detail, the GPI is derived from 25 indicators, according to the formula:

$$\begin{aligned} \mathrm{GPI} = {} & \mathrm{PC}/(\mathrm{GI} \times 100) + \mathrm{VHP} + \mathrm{VHE} + \mathrm{VVW} + \mathrm{SCD} + \mathrm{SH} - \mathrm{CCr} \\ & - \mathrm{LLT} - \mathrm{CUn} - \mathrm{CCD} - \mathrm{CCom} - \mathrm{CHPA} - \mathrm{CAA} - \mathrm{CWP} \\ & - \mathrm{CAP} - \mathrm{CNP} - \mathrm{LWL} - \mathrm{LFL} - \mathrm{LPF} - \mathrm{RD} - \mathrm{CDED} - \mathrm{COD} \\ & + / - \mathrm{NCI} + / - \mathrm{NFB}; \end{aligned} \tag{7}$$

where PC is personal consumption; GI, Gini Index; VHP, value of housework and parenting; VHE, value of higher education; VVW, value of volunteer work; SCD, services of consumer durables; SH, services of highways; CCr, cost of crime; LLT, loss of leisure time; CUn, cost of underemployment; Ccom, cost of commuting; CHPA, cost of household pollution abatement; CAA, cost of auto accidents; CWP, cost of water pollution; CAP, cost of air pollution; CNP, cost of noise pollution; LWL, loss of wetlands; LFL, loss of farmland; LPF, loss of primary forests; RD, resource depletion; CDED,

prefers a dashboard approach to composite indicators; in accordance with HPI philosophy, however, there is an emphasis on measures of subjective well-being (Everett, 2015).

carbon dioxide emission damage; COD, cost of ozone depletion; NCI, net capital investment; NFB, net foreign borrowing (Talberth et al., 2007: 8–18).

Although not devoid of foundations in economic theory and the principles of sustainable development, this measure too has provoked serious criticisms concerning its theoretical foundations, calculation methods and the choice of components (for an overview, see Talberth et al., 2007: 7). A series of refinements have dealt with some computational problems, but have not answered what is probably the main objection — the arbitrariness of what GPI includes or excludes. This arbitrariness is due to the lack of consistent conceptual foundations. The index aims to measure 'sustainable utility', but this ambition reveals two fundamentals contradictions.

First, 'utility' is too subjective to be measured by any objective index. For example, personal consumption is discounted by income inequality on the reasonable assumption that rising income inequality hinders economic welfare (Hsing, 2005), but why the Gini index is used instead of other measures remains unclear,[17] and the assumption of a linear function between growth in inequality (whatever the corresponding index may be) and reduction in welfare is neither discussed nor justified. Moreover, as argued by Neumayer (1999), GPI does not allow for corrections for other dimensions having an effect on utility, such as the degree of political freedom or the degree of inequality between sexes. Disservice items (such as commuting costs, the loss of leisure, etc.) are highly subjective and cannot be computed on the basis of objective measures: for example, the loss of leisure is measured in terms of the average real wage rate, but this can hardly be the same for every citizen (rather, every citizen should have computed her/his own leisure time in terms of his/her own wage rate); furthermore, as pointed out by Lawn (2005) and Rymes (1993), among the others, it is unclear whether or not these disservice costs have already been included in household and worker decisions. The only way of measuring utility which appears to be consistent with the utility approach should be to subjectively quantify the utility of each person, for example by asking people how happy they are. This is what the Happy Planet Index tries to do, and yet this method does not escape the general criticism of the utility approach, as formulated most famously by Amartya Sen (1999: Forward).

The second contradiction relates to the adjective 'sustainable'. As Dietz and Neumayer (2006: 189) argue, it is 'not possible to combine an indicator of current welfare with an indicator of sustainability': the depletion of non-renewable resources can hardly have an impact on *current* welfare, i.e. on utility. However, deductions for natural capital depletion do have some foundations in economic theory, as defenders of GPI such as Lawn (2003)

17. The Gini index has some mathematical limitations: it tends to increase with the size of the population (and thus of the country) and does not perfectly replicate income distribution. Because of the differing shapes of their Lorenz curves, two countries scoring the same Gini index and the same income average may have a very different income distribution.

underline: such deductions are consistent with Fisher's definition of capital and income (Fisher, 1906). The point here — and a point that the critics of GPI and ISEW seem to have overlooked so far — is that the concepts of capital and income are linked to the wealth approach, rather than to the utility approach; that is, they should be used to refine and improve GDP.

The Happy Planet Index (HPI) is a measure of the ecological efficiency of supporting well-being. Its formula looks more straightforward than GPI's, although not necessarily more appealing (let alone consistent). Its only three components are life expectancy, life satisfaction and the ecological footprint. By multiplying life expectancy by life satisfaction, a composite indicator called Happy Life Years (HLY) is estimated, which is then divided by the Ecological Footprint (EF) to calculate the index; the addition of two constants (α and β) is also necessary, in order to standardize variations and then trade-offs among the components:[18]

$$\mathrm{HPI} = [\mathrm{HLY}/(\mathrm{EF} + \alpha)] \times \beta. \tag{8}$$

Data on life satisfaction are obtained by asking a sample of people a simple question: *All things considered, how satisfied are you with your life as a whole these days?*, with responses ranging from 0 (unsatisfied) to 10 (satisfied) (Abdallah et al., 2009: 52). The ecological footprint of an individual (per capita) is a measure of the amount of land required to provide for all her/his resource requirements, plus the amount of vegetated land required to absorb all her/his CO_2 emissions and the CO_2 emissions embodied in the products she/he consumes.[19] It is expressed in units of 'global (per capita) hectares', which are calculated by estimating the total amount of productive hectares on the planet and dividing this amount by the world's population, 'on the basis that everyone is entitled to the same amount of the planet's natural resources' (ibid.: 12). Therefore the ecological footprint, whose value is specific to each country, will lie above 1 if the average citizen of that country is consuming more than her/his entitled share of the planet resources to achieve happiness, and below 1 if she/he is consuming less.

Originally introduced by Wackernagel and Rees (1996), the EF quickly gained popularity among environmental organizations, the press and policy makers; according to the proponents of HPI, the EF is an objective measure, with a reduced degree of arbitrariness. However, the process of calculating the per hectare requirement of each country is far from undisputed, and the EF has been criticized in ecological economics for being too hypothetical and not taking into account, for example, technological progress, international trade and sustainable land use. Critics suggest that it may even lead policy makers

18. The value of the constants changes according to the values in the sample: in the 2005 report, α was 3.35 and β 6.42; see Abdallah et al. (2009: 54, 60), for more details. In the 2012 HPI report some refinements were introduced in the statistical adjustments (Abdallah et al., 2012: 20–21), following Eurostat (2012).
19. The authors used ecological footprint data from WWF (2008).

in a direction contrary to its declared goals, that is, towards unsustainability or inefficient economic choices (van den Bergh and Verbruggen, 1999).[20] Life expectancy is of course an objective measure, but the same cannot be said for life satisfaction, notwithstanding its importance (Layard, 2011) and the considerable efforts spent in producing and collecting measures of happiness (Helliwell et al., 2012). Thus the HPI is an indicator which combines objective and subjective measures of well-being, and adds a third measure, the EF, which is seriously questioned by many.

In conceptual terms, the HPI looks like a mixture of the utilitarian approach (life satisfaction) and the wealth approach (life expectancy and ecological footprint). The problem is that the utilitarian and the wealth approach are hardly reconcilable: utilitarian measures, which are essentially subjective, should not be used as indices of economic performance alongside wealth indices. Sen (1999: 54–110) highlights the two main problems: distributional indifference (happiness can be less costly for some people, but it would be unfair to give these people fewer opportunities); and adaptation and mental conditioning (people can adapt to oppressive situations, and thus the utilitarian approach can find itself justifying those oppressions, including oppressions deriving from a lack of material resources.[21] Although Sen did not develop these arguments in relation to HPI, they may be apt. In the HPI top ten ranking we find countries such as Guatemala and Honduras (Abdallah et al., 2009: 61), where life, by any standards, is hard. Such results would seem highly unlikely by any objective criterion.

THE WEALTH APPROACH: HOW TO BUILD A MORE INCLUSIVE SYSTEM OF NATIONAL ACCOUNTS

The enduring success of GDP is due, in the first instance, to its relatively coherent conceptual foundations, anchored in the wealth approach. In a nutshell, GDP is a monetary measure of the amount of resources (goods and services) saleable in the market that an economy can produce (Beckerman, 1987; Feinstein, 1987; Felice, 2016; Lequiller and Blades, 2006). It is therefore a measure of income, i.e. of the wealth produced in a given time period. Wealth, or resources, can be measured with a reasonable degree of

20. For more on the criticisms of EF, see Fiala (2008). In 2000, *Ecological Economics* dedicated a special forum to a critical review of the new measure (see, e.g., Ayres, 2000).
21. One solution to these problems may be the use of positional interpretations, which take into account the social stratification of the people interviewed. Positional interpretations 'can be seen as points of contact between individuals and the social structures in which they live' (Comim and Amaral, 2013: 5). They are used in the construction of the Human Value Index (HVI), a composite indicator along the lines of HDI, which aims to build a bridge between the capability approach and the subjective well-being approach. Even if we accept the validity of the positional interpretations approach, however, HVI may be subject to the same criticisms brought against HDI.

objectivity.[22] It is true that when we try to convert nominal wealth into real wealth more problems arise, since there are different purchasing power parities which can be used and their choice is not constrained by any objective rule. For instance, the most common PPP, based on US dollars, is constructed on (an estimate of) the standard of living in the USA in a certain year. Nevertheless, it is a choice that can be defended with arguments consistent with the wealth approach (in this case, the argument that the USA is the biggest economy in terms of GDP and therefore its price system can be taken as a yardstick).[23]

Acknowledging that wealth can be measured with more objectivity than capabilities or utilities does not close the discussion about its components. This is a long-running debate which has led to a degree of theoretical consensus on how to refine GDP in order to include, at the very least, environmental costs. However, the fact that not even refined measures of GDP have so far been fortunate leads us to the second, more fundamental reason behind the enduring primacy of GDP. It is the indicator which measures economic change in capitalist market economies,[24] the type of economies in which the vast majority of the world's population lives; the prevailing values in these societies, and the interests of their dominant social actors, inform the dimensions which are directly measured by GDP. Other dimensions incorporated by alternative indices are not of immediate concern.

Let us take two examples. Two fundamental adjustments to GDP have been proposed which can be considered within the wealth approach: the expansion of the system of national accounts to include (a) unpaid work (mostly by women) and (b) the value of environment. Both these issues have been the subject of academic discussion at least since the 1970s.[25] The Genuine Progress Indicator has made some efforts to include unpaid work, although only in the United States, by counting the value of household work and parenting. John Kendrick (1979) proposed a calculation based on non-market household production as the product of the hourly wages of domestic workers and the number of hours devoted to unpaid household work. Following this approach, Robert Eisner (1989) produced benchmark estimates for the

22. Although some caution is warranted here. Objectivity can be achieved if we hold that market prices are linked to the cost of production (or to some other objective measure), as assumed in classical political economy. But if market prices depend upon other factors such as subjective preferences, as in marginal utility theory, there is no objectivity anymore. In fact, GDP reflects the values of capitalist society; this becomes manifest in market prices, and in the quantities produced. John Kenneth Galbraith (1958) famously made this point, and it remains relevant today.
23. A review of different PPPs goes beyond the scope of this article; for a discussion of the problems involved in their choice, with special reference to long-run cross-country comparisons, see Felice (2016: 275–7).
24. The first official estimates of national income were published in the USA in 1934 by the National Bureau of Economic Research, with the decisive contribution by Simon Kuznets (Carson, 1975).
25. See especially the seminal book of Marilyn Waring (1988).

USA for 1965, 1975 and 1981. GPI researchers later extended Eisner's data to produce more benchmark estimates for 1985, 2003 and 2004 (Talberth et al., 2007: 9). This methodology looks reasonably reliable, although it is subject to a number of assumptions, but it is highly data demanding. The value of housework and parenting has an inverse relationship to GDP: the lower the GDP, the higher the value of this unpaid work. For the USA, it accounted for about two thirds of personal consumption in 1950, dropping to about one third in 2004 (my calculations from Talberth et al., 2007: 21).

Recent research suggests that environmental accounting can also be reconciled with the system of national accounts, as the contributions of nature to human welfare can be defined and measured in a way consistent with the wealth approach (Boyd and Banzhaf, 2007; Ferreira et al., 2008). Roefie Hueting has developed the Environmentally Sustainable National Income measure (eSNI), which is defined as 'the maximum attainable production level by which vital environmental functions remain available for future generations'; environmental functions are defined as 'the possible uses of the non-human-made physical surroundings', given the present state of the technology (Hueting, 2013: 81). According to Hueting, the eSNI should be used in combination with the standard national income to estimate the sustainability of a given economic pattern.[26] This measure introduces future wealth (the sustainability of non-human-made physical surroundings), but does not explicitly consider technological change, which may dramatically increase the possible uses of the non-human-made physical surroundings. This implies that future wealth would be analogous to present wealth — an unrealistic assumption which makes the eSNI problematic in terms of theoretical foundations. This inconsistency can be easily avoided by ignoring future wealth and calculating an environmentally corrected GDP while remaining within the framework of current wealth. Dimensions such as the depletion and degradation of natural resources, the consumption of fixed capital, and the negative consequences of pollution, can be estimated and included in GDP or GNP indices. This would ensure that attention is paid to the depletion of natural resources (as the eSNI does), and would be more theoretically consistent with the wealth approach. Furthermore, the derived measures could be included in standard GDP accounting and would allow for cross-country comparisons, especially given that (in contrast to the case of unpaid work) the value of these components is relatively easy to obtain from official international sources. For instance, an environmentally corrected GDP (GDP^e) can be calculated as:

$$GDP^e = GDP - CFC - MD - ED - NFD - CDD - WPD - PED; \quad (9)$$

where GDP is Gross Domestic Product, i.e. the sum of value added by all producers living in a country plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income

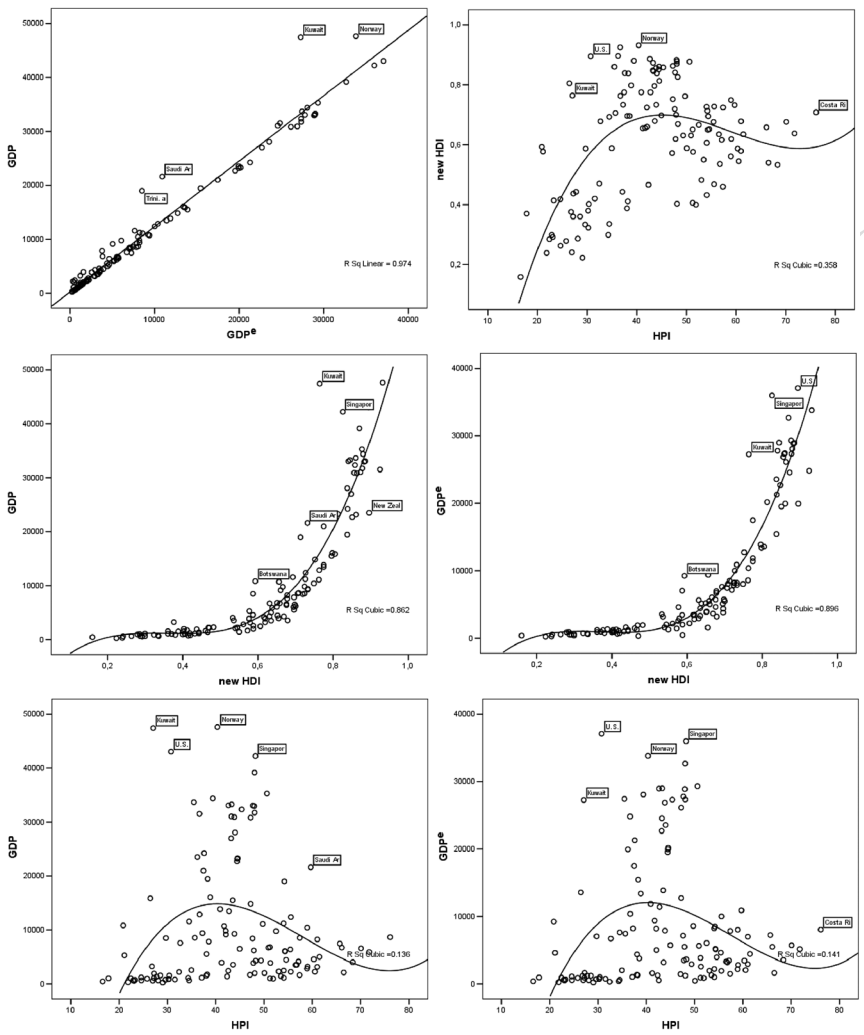
26. For discussion and application, see the essays in van Ireland et al. (2001).

(compensation of employees and property income) from abroad; CFC is consumption of fixed capital (the replacement value of capital used up in the process of production); MD is an estimate of mineral depletion; ED is an estimate of energy depletion; NFD is an estimate of net forest depletion; CDD is an estimate of carbon oxide damage (basic air pollution); WPD is an estimate of water pollution damage (water pollution); PED is an estimate of particular emission damage (other pollution). Almost all of the necessary data for these variables (GDP at 2005 PPP US$, CFC, MD, ED, NFD, CDD, PED), can be taken from the World Bank dataset (World Bank, 2013); only WPD (water pollution damage) has to be estimated, as the product of the organic water pollutant emissions (from the same source) and the average cost per kg/day of water pollutant (from Dodds et al., 2009).[27] From these sources, I have produced estimates of GDP^e for 130 countries in 2005[28] and compared these with the standard GDP (also at 2005 PPP US$), as well as with the new HDI[29] and with HPI (the full table is available from the author upon request, and online; see Supporting Information Table S1). Figure 1 (below) presents elaborations from Table S1 in graphic form.

These comparisons shed new light on the characteristics and informative power of the indicators. As expected there is a high correlation between GDP and GDP^e, the main difference being that the latter lowers the value of oil exporting countries (most notably Saudi Arabia, Kuwait, Norway, Trinidad and Tobago, all outliers in the upper left quadrant of Figure 1) which are heavily depleting their energy wealth. GDP^e also displays a slightly higher correlation with the new HDI and with HPI, than the standard GDP does. However, the regression line that best fits the correlation between GDP/GDP^e and the new HDI, and to a lesser extent also the HPI, is a cubic or a quadratic one.[30] This suggests the existence of a non-monotonic relationship between income and either human development or well-being, which is confirmed by the use of an environmentally corrected GDP. Furthermore, the new HDI

27. In more detail, the average cost per kg/day of water pollutant has been estimated using data on total potential annual value losses due to water pollution for the USA in 2008 (Dodds et al., 2009); the total was divided by the US organic water pollutant emission in 2008 (World Bank, 2013), and extrapolated backwards to 2005 using the cost of living index. The average cost per kg/day of water pollutant for the USA was then applied to other countries after being converted through PPP coefficients (from the same source).
28. In order to have comparable figures, all the data for equation (9) have been expressed at purchasing power parities (international PPP US$, deflators are also from World Bank, 2013).
29. For the new HDI, the 2010 formula (with empirical thresholds) has been selected in preference to the later ones (which have theoretical thresholds based on inconsistent criteria, as argued above). However, the differences between the various formulations of the new HDI are minimal (also for the scatter correlations of Figure 1).
30. The fit lines are as follows. Between GDP and new HDI: 0.633 linear, 0.842 quadratic, 0.862 cubic. Between GDP^e and the new HDI: 0.644 linear, 0.873 quadratic, 0.896 cubic. Between GDP and HPI: 0.001 linear, 0.116 quadratic, 0.136 cubic. Between GDP^e and HPI: 0.002 linear, 0.119 quadratic, 0.141 cubic.

Figure 1. Scatter Correlations between GDP, GDP^e, New HDI and HPI for 130 Countries (2005)



Note: For each pair, the fit line displayed is the highest one of linear, quadratic, or cubic.

Source: Elaborations from Table S1 (available as Supporting Information online, or from the author).

shows a good correlation with GDP/GDP^e with few deviations that can serve to identify which countries are performing better or worse in terms of social components. In contrast, the HPI displays a weak correlation not only with GDP/GDP^e but also (although less so) with the new HDI: in this respect, it

looks like an outlier with little additional informative power when compared with the other measures. It would have been extremely interesting to look at cross-country correlations of the GPI, but this is currently impossible; since this index is highly data demanding, statistics have only been produced for a limited number of countries.[31]

To sum up the results from Figure 1, an environmentally corrected GDP remains much closer to the standard GDP than to the alternative measures; when contrasted against both GDP and GDP^e, HDI maintains useful informative power in terms of social components, unlike HPI. However, what matters here is that an environmentally corrected GDP performs slightly better than the standard GDP in terms of social dimensions — although not even GDP^e tracks them directly — while being at the same time conceptually consistent with the wealth approach and even better able to measure the capacity of producing income (by making some distinction between the production of income and the exploitation of natural resources). Moreover, it would not be difficult to have world statistics of environmentally corrected GDP or GNP. But if this is true, why have such attempts at environmental accounting passed almost unnoticed thus far? In other words, what explains the enduring primacy of standard GDP, even versus alternative indices which are equally consistent?

EXPLAINING GDP PRIMACY

There have been a number of investigations recently into the history of GDP and the reasons for its primacy. Two different views are emerging, one mostly based on behavioural economics, the other on economic policy. Both are interesting, but while the former misses one important point, the latter (which is more similar to the argument presented in this article) fails to draw its logical conclusions. Let us examine these competing views in a little more detail.

After reviewing the main limitations of GDP, van den Bergh (2009) has identified behavioural features, namely bounded rationality (including conformism) and historical lock-in, as the main explanation for the enduring primacy of GDP in spite of its shortcomings. These are certainly important issues, but van den Bergh overlooks the fact that society is a complex and living fabric; it is based on principles and rules that are more in line with GDP than with its possible alternatives. For instance, the author talks of a 'GDP paradox'; but the enduring success of GDP is only a paradox if we judge it by the vague concept of 'social welfare', as he does (ibid.: 127). Is it a paradox, as van den Bergh suggests (ibid.: 128), that 'Despite the fact that many respected economists have expressed or supported the fierce criticism

31. First USA, then also Austria, Australia, Canada, Chile, Germany, Italy, Netherlands, Sweden, UK (Center for Sustainable Economy, 2015: 7; Demos, 2011: 26–7).

of GDP as a welfare or progress indicator, the large majority of economists, journalists, civil servants and politicians are not concerned at all about the imperfections of GDP information'? Isn't it, rather, the proof that GDP is still a useful concept for some groups and interests in society — indeed, the prevailing ones, in a capitalist market economy based on individualism and market prices — in spite of its faults when it comes to proxying personal well-being?

Dirk Philipsen (2015) has linked the impressive rise of GDP in the twentieth century to the fact that GDP appears to provide precious help in dealing with some basic problems felt in the capitalist market economies — that is, with issues of economic policy as they have historically manifested, including recovery from the Great Depression in the 1930s, the need to out-produce the Nazis in World War II and then to out-perform the Soviets in the Cold War. If this theory is true, GDP should have lost most of its appeal now that economic policy priorities are no longer focused on out-competing alternative political and economic systems, or providing the means to win a world war based on total mobilization. Philipsen also argues that GDP's failure to consider future consumption, i.e. the depletion of natural resources — which, in some senses, makes an increase in GDP a 'steal from the future', to be sold in the present and called growth (ibid.: 12) — has been overlooked by policy makers simply because it was not their direct concern. However, he does not draw the logical conclusion from his historical analysis: when discussing the alternatives to GDP as a measure of welfare, Philipsen disregards the fact that none of them can become a viable substitute until a clear advantage to implementing them emerges from the dominant groups in a society. In other words, for GDP to be replaced, the definition and understanding of welfare need to change across society — and not just in the minds of a handful of scholars — away from the concept we largely accept today which is based on monetary wealth and the price system behind it.

Following the same logic, the explanation for GDP's enduring primacy is simple: standard GDP embodies the prevailing values of our capitalist market economies and societies, and their interests and goals, better than any of the possible alternatives. Standard GDP measures the income which is produced and sold in the market. Neither housework, by definition, nor environmental goods, are produced and sold in the market (even though they can be substitutes of saleable goods and services). Since they are not monetized and exchanged in the market, our capitalist market economies are relatively uninterested in them.

In this light, we can now look again at the debate about composite indicators. Each composite indicator, with its weights and components, reflects the preferences of a society; however, there is no political agreement over these implicit weights. These are the product of the way the society is organized, of the struggle between different players and social actors, of the resulting prevailing values and interests. The idea which motivated the birth of HDI — and all the composite indicators that followed — was to provide one single

number which would take into account social and environmental dimensions and which would serve as guide for policy makers (UNDP, 1999: 23). But this is based on the illusory idea that the policy maker is a neutral actor, who would gladly take an indicator more inclusive than GDP if one were available. In reality, the policy maker is the result of social dynamics and social struggle, and would accept an alternative to GDP only after the preference system of a society has changed.[32] Such a new indicator could be a composite one, an improved version of GDP such as the one presented here, or one or more simple indicators radically different from GDP: life expectancy, for instance, if the dominant value of a society becomes longevity rather than money; education, if it becomes knowledge; the degree of personal freedom; the per capita amount of clean air, and so on.

Meantime, the different groups of a society vie to affirm their competing values. The primacy of GDP is questioned by those groups who value monetary wealth less than other dimensions, from environment to well-being, to knowledge or freedom, and who thus (implicitly or explicitly) are proposing a society at least partially different than the current capitalist market one. Since at least the invention of HDI (but actually even before), the art of producing indicators has flourished. These can be useful for historical analysis (Prados de la Escosura, 2013) or to enrich the development debate, but in terms of policy guidance composite indicators are seriously problematic: their unclear theoretical foundations lead them to obscure more than they illuminate; and they are based on implicit weights and assumptions on which there is no real consensus.

So, what should we do? Two competing strategies suggest themselves, depending upon the researcher's goals. One is multivariate analysis, which does not superimpose any given system of preferences and values, but derives these from the empirical analysis of the observed sample (e.g. Munda, 2015). Although on theoretical grounds it is an intriguing tool, for practical purposes it is less viable. It not only has computational problems in the presence of a high number of observations, as Munda (ibid.: 12) fairly acknowledges, but there is also a potential bias due to the way the sample is constructed: the weighting schemes (and of course the results) are dependent on the indicators and countries selected. It can therefore be useful for solving specific policy problems, in the context of different and competing preference systems, but in order to claim general validity, multivariate analysis should include all the possible indicators reflecting all the different preferences, for all the possible cases of the sample (in our case, for all the countries of the world) — virtually impossible.

32. Sehnbruch et al. (2015: 198) argue that the 'political will' of the institution that launches a new concept is a 'key factor' for the success of that concept; but this must be a necessary condition, not a sufficient one, as proved by the fact that the strongly supported HDI succeeded in comparison to other alternative measures, but failed with respect to the standard GDP.

The other strategy is a dashboard approach: the use of a battery of indicators, each reflecting one dimension and thus tracking a specific problem. Such an approach has been proposed, among others, by Ravallion (2011) for poverty assessment. One ambitious programme — the Better Life Initiative, launched by the OECD in 2011 — considers 11 dimensions of well-being (including 'income and wealth', adjusted to allow for unpaid work in the household);[33] it also includes a Better Life Index, intended as 'an interactive tool that allows users to set their own weights on the 11 dimension of the OECD well-being framework' (Durand, 2015: 13). In other words, it operates as a battery of composite indicators, each one the product of a specific preference system and able to target definite policy goals. Such a dashboard approach, which has no pretension of general value, can turn out to be a good policy instrument, insofar as it provides different social groups which are struggling to pursue their own goals with the proper quantitative backing. GDP can be seen as one of these dashboard indicators.

CONCLUSIONS

Over recent decades, several composite indices have been proposed, in order to measure economic development or prosperity in a more inclusive way than the standard system of national accounts. Despite considerable efforts and much debate, however, thus far none has proved itself able to replace GDP. This article has critically reviewed the alternative indices that are arguably the most popular: the Human Development Index, the Genuine Progress Indicator, and the Happy Planet Index. These composite indicators have been criticized on the grounds (relatively overlooked so far) of their faulty conceptual foundations: a case is made that, unlike the wealth approach which lies behind GDP, neither the capability approach nor utilitarianism are suitable to be conveyed into an objective measure which can serve as a guide for policy makers. The article then went on to argue that well-being and ecological goals, the main concerns motivating the alternative indices, can instead be coherently incorporated into an extended wealth approach, that is, into the same conceptual framework underlying the current system of national accounts. Such improvements on GDP turn out to be both feasible and theoretically consistent: however, they have not yet been successful in supplanting the traditional measures. This failure suggests that a further reason for the enduring success of GDP, beyond conceptual consistency or

33. The other dimensions are: jobs and earnings; housing conditions; health status; work–life balance; education and skills; social connections; civic engagement and governance; environmental quality; personal security; subjective well-being. Each of these dimensions is proxied through one or more 'headline indicators'; in some cases, these are complemented by 'secondary indicators', with more limited country coverage, or based on sources that are deemed to be less reliable than in the case of headline indicators (Durand, 2015).

statistical soundness, is 'social suitability'. The standard system of national accounts is better able to reflect the dominant values of our capitalist market economies and their prevailing interests. This is not surprising: it is within these capitalist market economies that GDP was conceived and developed. Inasmuch as environmental and social components are not directly produced and sold in the market (even though they can be measured at market prices) they are of little interest to the main players in capitalist market societies.

If we accept that composite indicators cannot be superimposed upon the actual structure of a given society, but are rather the product of a prevailing preference system already in place, we can also acknowledge that searching for and developing composite indicators as alternatives to GDP is trivial without a change in the current preference system. Indeed, in the quest to achieve such a change, composite indicators can even be misleading, since their underlying preference system is not transparent and may be at odds with their conceptual foundations. In this context, a dashboard approach is preferable since it provides the different social groups with clear and understandable quantitative instruments resulting from their specific preference systems.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article at the publisher's web-site:

Table S1. GDP, GDP^e, New HDI and HPI for 130 Countries (2005)

Author Query

Query No.	Description	Remarks
Q1	Author: Please confirm that given names (red) and surnames/family names (green) have been identified correctly.