Policy brief

On dashboards and indicators

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In the search for better indicators than GDP to assess social progress, there is a recurring debate about whether one should seek a single alternative that would replace GDP as an overarching indicator, or develop of dashboard of multiple partial indicators capturing the situation in different domains.

This policy brief conveys three messages:

1. Dashboards and synthetic indicators should go together and not be considered in competition
2. The indicator should determine the composition of the dashboard, not the other way around
3. Seeking a single indicator overlooks the multiplicity of views about a good society, there should be multiple indicators, each with its companion dashboard

It also introduces the various schools of thought which can inspire the construction of indicators, and provides examples of how such indicators could be set up.

Dashboard and synthetic indicators are not in competition, but complementary

There is often a debate about whether going beyond GDP is best done with a dashboard documenting several domains, including non-economic domains, or with a synthetic indicator summarizing everything in a single number.

There is no reason to oppose dashboards to synthetic indicators. On the contrary, they should always go together. A dashboard without a synthetic number is leaving decision-makers in the uncomfortable position of having to construct the latter by themselves, because if they make mutually consistent decisions, these decisions reflect a ranking among the dimensions of the dashboard, and this ranking can be represented by a numerical objective function. In other words, no dashboard is ever used to make decisions without the decision-maker having to make up a synthetic vision of the objective based on the dimensions of the dashboard.

Conversely, a synthetic indicator without a table disentangling the relative contributions of the components is of little use to a decision-maker and to the public debate. If social welfare goes down, everybody wants to know why, and this requires identifying the components that trigger this downward shift. The levers of action are intimately linked to the components of the indicator and therefore the various components need to be documented as prominently as the synthetic indicator.

The dashboard-indicator pair should be driven by the indicator

Therefore one can swiftly move over the question of choosing between a dashboard and a synthetic indicator. A more interesting question is what should come first. Should the dimensions of the dashboard be identified first, and be followed by the construction of a synthetic number? Or should the synthetic number be first derived from some consistent theoretical basis, and its components be obtained secondarily, with possibly multiple decompositions along several typologies of components?

This question relates to the choice between pragmatic composite indicators and theory-based synthetic indicators. When a dashboard of different domains is constructed without reference to a theory of the

objective function underlying it, it is very hard to conceive of a method to aggregate the various domains and one then typically falls back on the methodology of weighted "composite" indicators, with weights which are not based on empirical or normative facts but on some convention or convenience. The typical example is the Human Development Index, where equal weights after normalizing the components are adopted out of the Laplace principle (in absence of reason to have unequal weights, equality prevails).

A theory-based synthetic indicator, in contrast, will guide the construction of dashboards decomposing the indicator into multiple contributing components. For a single indicator, several decompositions and therefore several associated dashboards can be jointly useful. An example is provided in what follows.

Welfare economics has for decades elaborated and refined the concept of a social welfare function (SWF). It aggregates measures of well-being for each member of the relevant population (i.e., human and possibly non-human). These measures of well-being are themselves synthetic indicators of the multiple dimensions of the individuals' lives. The SWF number is the best example of a theory-based synthetic indicator (see arguments in favor of this approach in the Appendix).

Once a combination of individual well-being measures and a SWF has been adopted, the level or the variation (in time or in comparisons across different situations) of social welfare can be decomposed along several complementary lines:

1) average well-being and inequalities, according to the famous formula of the equally distributed equivalent level of well-being proposed by Atkinson, Kolm and others. (It is also possible to introduce poverty in this decomposition, details are available upon request.)

2) the individual dimensions of well-being, through a computation of contributions of each of these dimensions to social welfare through a Shapley-value type of computation.

3) other decompositions single out the specific impact of the correlation among dimensions (the disadvantaged people tend to cumulate multiple deprivations), of the heterogeneity of individual preferences, etc. See formula (10) in
https://hdr.undp.org/system/files/documents/onhumandevelopmentindicatorsmfleurbaey.pdf for an example.

4) decompositions involving inequalities between and within subgroups are also useful, and among those, subgroups defined in terms of circumstances and opportunities are interesting (see the literature on inequalities of opportunities).

Pluralism requires multiple synthetic indicators

Once it is accepted that a synthetic indicator is needed on top of and in sync with a dashboard, the problem of pluralism emerges quickly. Unlike a pragmatic dashboard that amalgamates everything that various schools of thought find relevant (e.g., subjective data and objective data can be put together in a dashboard), a synthetic indicator requires making hard ethical choices on what to retain and how to aggregate it, both at the individual and at the social level. Since there is no consensus about how to compare individuals (in terms of subjective well-being, opportunities and capabilities, resources, living conditions, preference-based utilities or other terms…), and no consensus about the degree of priority to assign to the worse off, it is impossible for a pluralist society to converge on a

single indicator. GDP is often hailed as having the virtue of being a single number, but it is far from consensual, which is precisely the symptom of the need to recognize pluralism.[1]

The solution to this problem is simple. Each and every "reasonable" school of thought deserves to have statistics that document the state of society as this school sees fit. The qualification of "reasonable" is introduced here to exclude the views that are not logically consistent as well as the views that rely on abhorrent ethical principles such as elitism, racism, sexism, and other phobias against living beings.

Among the main schools of thought that are studied by the analysts of public views of social ethics, four stand out: egalitarianism (and prioritarianism), libertarianism, meritocracy, and utilitarianism. Each contains subschools and variants, but it can be argued that each of these views deserves to have statistics that depict the state of society according to its approach. Although this is debatable for libertarianism (which is often presented in deontological rather than consequentialist terms), I believe that each of these views can be incorporated into the SWF framework, and it is articulated around two key ethical choices:

1) How to compare advantages and disadvantages across individuals:

a) For egalitarianism, a measure of well-being in terms of functionings or living conditions, possibly weighted according to individuals' own values and preferences;

b) for libertarianism, a measure of living standards normalized by property rights, meaning that greater property induces greater claims on resources;

c) for meritocracy, a measure of individual opportunities or capabilities, that filters out the attributes that are left to personal liability or accountability or responsibility;

d) for utilitarianism, a measure of subjective well-being, which can either come from stated satisfaction or happiness, or from preference-based measures.

It is noteworthy that each of these approaches can mobilize a preference-based approach that respects individuals' values and preferences over their own lives (see Fleurbaey and Maniquet 2011 for a definition of preference-based libertarianism). Whether preferences and values of all individuals or social groups are worthy of respect is often debated, and objective-list approaches reject any grounding on people's perceptions and goals.

2) How to summarize the state of society from the distribution of individual situations:

a) for egalitarianism, the worse-off characterize the state of society, whereas for prioritarianism, a greater but not absolute weight is put on the worse-off;

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[1] Recall a rarely quoted part of the Stiglitz-Sen-Fitoussi report: "Recommendation 9: Statistical offices should provide the information needed to aggregate across quality-of-life dimensions, allowing the construction of <u>different</u> indexes. While assessing quality-of-life requires a plurality of indicators, there are strong demands to develop a single summary measure. <u>Several </u>summary measures of quality of life are possible, depending on the question addressed and the approach taken. Some of these measures are already being used, such as average levels of life-satisfaction for a country as a whole, or composite indices that aggregate averages across objective domains, such as the Human Development Index. Others could be implemented if national statistical systems made the necessary investment to provide the data required for their computation. These include measures of the proportion of one's time in which the strongest reported feeling is a negative one, measures based on counting the occurrence and severity of various objective features of people's lives, and (equivalent income) measures based on people's states and preferences." (emphasis added) See other quotes from that report in the appendix.

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b) for libertarianism, it is also natural to focus on the worse off as depicted by the libertarian measure of disadvantage: a rich who pays more taxes than a poor will be considered worse off by this approach;

c) for meritocracy, a prioritarian or egalitarian approach to the distribution of opportunities or capabilities is typically endorsed.

d) for utilitarianism, it is the sum total of individual utilities that best depict the state of society, and no aversion to inequality of well-being among individuals is introduced; this can nonetheless induce a substantial degree of priority for the worse off in terms of resources, due to the principle of diminishing marginal utility.

Examples of constructions of indicators for the four schools of thought are provided in the Appendix.

It is noteworthy most of these approaches can be described in egalitarian or prioritarian terms, once their preferred measure of individual advantage is adopted. This is very natural since the debates about social justice are often framed in terms of "equality of what?". Utilitarianism stands out as the outlier, where equality is embraced for weighting utilities but complete indifference to the distribution of utilities is advocated. Even the most prominent advocates of utilitarianism these days, such as Richard Layard, do recommend devoting special attention to the most miserable people. Nevertheless, important official guidelines for cost-benefit analysis (such as the UK Green Book or the Biden Circular A4) do limit the introduction of equity weights to considerations of diminishing marginal utility, therefore adopting the zero inequality aversion in utilities that characterizes utilitarianism.

Conclusions and recommendations

In conclusion, the main recommendations of this policy brief are the following:

1) Avoid drawing a list of "domains" that has no conceptual basis. Such a list is consensual only by default, because it is inclusive of all the lists that various schools of thought consider relevant. Instead, draw a list of important approaches to social ethics that deserve to have their views documented by adequate statistics. Such a list should at least include egalitarianism/prioritarianism, meritocracy/equality of opportunity/capabilities, libertarianism/rights approaches, and utilitarianism.

2) For each approach in the list, identify the pair of main indicator and associated dashboards (possibly multiple dashboards for a single indicator, as explained above) that best represents its way of assessing the state of society and the planet.

Any other way to proceed will be criticized by these main schools of thought as being conceptually weak or inconsistent, as well as ethically wrong.

Observe that adopting the capabilities approach as the overarching framework is questionable because it corresponds only to one of the four main schools of thought.

Appendix

A defense of the SWF approach

It has a very strong backing among the specialists of social ethics and normative economics, and is underlying a very interesting recent movement in cost-benefit analysis, as exemplified by the revision of Circulars A-4 and A-94 during the Biden administration. Such an evolution in cost-benefit analysis has been possible thanks to the pressure of many academics, and a most prominent one has been Matthew Adler, who has been the flag-bearer of the movement for the "SWF-approach to cost-benefit analysis".

Bergson and Samuelson have identified the main reason why the SWF approach is the prominent approach to social evaluation. This reason is a key theorem: Any approach that considers the improvement of the situation of any individual in society to be an improvement for society must rely on a ranking of the distribution of individual situations, suitably measured. A SWF is merely a particular representation of such a ranking.

All and any approaches that cannot be described in SWF terms must sometimes imply that improving the situation of an individual can be bad for society.

Citations from the Stiglitz-Sen-Fitoussi report about dashboards and indicators:

> "Dashboards nevertheless suffer because of their heterogeneity, at least in the case of very large and eclectic ones, and most lack indications about causal links, their relationship to sustainability, and/or hierarchies amongst the indicators used. Further, as communications instruments, one frequent criticism is that they lack what has made GDP a success: the powerful attraction of a single headline figure allowing simple comparisons of socioeconomic performance over time or across countries."

Regarding composite indicators, it questioned the weights attributed to the components:

> "The problem is not that these weighting procedures are hidden, non-transparent or non-replicable – they are often very explicitly presented by the authors of the indices, and this is one of the strengths of this literature. The problem is rather that their normative implications are seldom made explicit or justified."

Examples of measures of individual well-being and social welfare for the four schools of thought

Egalitarianism and prioritarianism

Social welfare can be measured as the equally-distributed equivalent (EDE)

$$W = \left(\frac{1}{n} \sum_i (u_i)^{1-\rho} \right)^{\frac{1}{1-\rho}}$$

for a range of values of the coefficient of inequality aversion ρ.

Individual well-being can measured by aggregating various dimensions of living conditions: income, health/longevity, social status (e.g., employed), family status (e.g., married with children),… It is recommended to use one of the dimensions as the numeraire in order to avoid scaling issues. Economists have proposed income as the numeraire (a long tradition dating back to Samuelson, Deaton…), life years have also been proposed (by Roger Cookson). The aggregation is then done in the following way. Starting from some aggregation of the attributes d_{ik} with scaling functions f_k (e.g., log for income) and weights w_k:

$$\sum_k w_k f_k(d_{ik})$$

the same aggregation expressed in equivalent units of dimension d_1 takes the form

$$u_i = f_1^{-1}\left(f_1(d_{i1}) + \sum_{k>1} \frac{w_k}{w_1} [f_k(d_{ik}) - f_k(d_k^*)] \right)$$

This equivalence approach relies only on relative weights $\frac{w_k}{w_1}$, which is a great advantage. One drawback, though, is the need to pick reference values d_k^* for the non-d_1 dimensions. Taking "good" or "normal" values is recommended, because the measure then reflects a correction of d_{i1} for shortfall from the good levels.

The relative weights $\frac{w_k}{w_1}$ can be obtained from estimations of (ordinal) preferences in the population. This approach works with heterogenous preferences $\frac{w_{ik}}{w_{i1}}$ as well. Alternatively, the relative weights can be obtained from participatory approaches.

Libertarianism

The same SWF, in the EDE form, can be adopted, but with a different measure of individual well-being. A simple version considers market income as fully deserved, and measures advantage relative to this benchmark as the ratio of disposable income over market income (both in real terms).

When heterogenous prices are introduced, as well as non-monetary quality of life, a money-metric approach with reference prices p^* can be used:

$$u_i = \frac{e(p^*, d_i)}{p^* \omega_i}$$

where $e(p^*, d_i)$ is the minimum budget needed at these prices to be as satisfied as with the living conditions d_i, and $p^* \omega_i$ is the market value at the reference prices of the individual's endowments.

This libertarian measure may appear ideologically extreme, but interestingly, in countries where those who pay the most taxes are the middle class, it will make the middle class appear worse off than the low income people who have a low or even negative average tax rate, and the upper class that excels at tax evasion. This may resonate with many people.

Meritocracy/opportunities/capabilities

This approach gathers quite different schools of thought that, in fact, propose very similar measures, which is why they are brought together here.

Again, the same egalitarian-prioritarian SWF can be adopted. The individual measure of well-being can start from the same as for egalitarianism, and then replace the individual value with the average level over the group of individuals sharing the same circumstances (parental background, geographical origin, …) as the individual. This focuses on inequalities between groups sharing circumstances, and ignores inequalities within the groups. This measure can also be depicted as taking the same individual measure as for egalitarianism and changing the SWF, into one that averages well-being within each group with identical circumstances.

This particular measure, which is inspired by the literature initiated by J. Roemer, relies on the assumption that the value of the opportunities of a member of a group sharing the same circumstances is proxied by the average outcome in the group.

Other measures of the value of opportunity sets (also called capabilities by Sen) can be considered. One possibility is to retain some lower degree of inequality aversion within groups, and take the EDE within the group (lower than the average) as the measure of the value of the opportunities of the group. One then takes these groups' EDE values to replace individual outcomes, and insert them into a SWF with greater inequality aversion. This is a nested CES function, in which each group has its own CES (in the form of the group EDE with a low inequality aversion).

Yet another possibility is to adopt a libertarian approach within groups and an egalitarian approach across groups. This is closer to many authors' understanding of the idea of equal opportunities, meaning that inequalities with groups emerging naturally from the market are not to be corrected (a libertarian view, not a utilitarian one). One particular application of this approach consists in measuring social welfare in terms of (negative) the maximum tax rate (the average, not the marginal tax rate) among low-income people or (positive) the minimum rate of subsidy received by these people, in case they also have a disposable income greater than their market income. The focus on the greatest tax rate is libertarian, the focus on low-income people is egalitarian and assumes that low-income people share the worst circumstances. (See Fleurbaey & Maniquet JEL 2018 for details and variants.)

Utilitarianism

Now the SWF is the simple sum

$$\sum_i u_i$$

and u_i is usually recommended to reflect subjective well-being.

The most common example of this approach is using average life satisfaction as the measure of social welfare. This is a cheap, easy to understand, statistics.

A key issue is whether life satisfaction scores are comparable across time and space (the Easterlin paradox). A particularly illuminating study of the shift of scales over time is a recent WP by Senik and Prati. They observe that retrospective life satisfaction scores consistently reflect people's judgment that their situation has improved, whereas current life satisfaction scores stay stable over time. By taking life satisfaction improvements as the relevant measure, they show that average life satisfaction increases over time in a similar way as GDP (for the USA).