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Gross Domestic Problem: Why GDP Misleads & How to Fix It

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A Survey of Recent Research

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Abstract

This research paper surveys academic research done during approximately the past five years, on new approaches to measuring economic growth and well-being, replacing the conventional Gross Domestic Product 'national accounts' measure, in use since 1934, that is now understood to be flawed.

While it is seen that GDP as a measure of well-being is problematic, it is not clear that a simple, understandable and consensual substitute is available as an alternative.

“While GDP is the most well-known, and most powerful economic indicator, it can't tell us everything we need to know about the health of countries and societies. In fact, it can't even tell us everything we need to know about economic performance. We need to develop dashboards of indicators that reveal who is benefitting from growth, whether that growth is environmentally sustainable, how people feel about their lives, what factors contribute to an individual's or a country's success.....

Stiglitz et al, 2018, preface.

“If we want to put people first, we have to know what matters to them, what improves their well-being, and how we can supply more of whatever that is.”

Stiglitz, 2018¹

“Though the...Gross National Product has been 'sold' to the public, it has been 'sold' by economists. We have a responsibility for it – the responsibility of the manufacturer for the quality of the goods which he sells.”

J. M. Hicks, quoted in Coyle, 2019², p. 1.

Policy, it is said, begins with measurement. There are two reasons for this.

First, diagnosis. It is difficult to fix a problem, by designing and implementing optimal policies, if you cannot diagnose it by first measuring its severity, nature and extent.

Second, evaluation. Is the policy effective? How do we know? This requires accurate and effective measures of impact and results. The latest Nobel Prize in Economics was rightly awarded to three economists who pioneered in studying policy through initiating social experiments and then observing, comparing and measuring the outcomes [See Banerjee et al., 2011]³.

Economic policy is, for both these reasons, widely based on Gross Domestic Product. It is emerging that GDP is highly-flawed, misleading measure, that fails to quantify what it purports to measure, and that new and better alternatives are desperately needed.

Managing the economy and its performance indeed must begin with measurement. But mismeasurement, as with the current GDP measure, assigned a role it was not originally designed to fulfill, is highly damaging and misleading. As Stiglitz et al. (2018)⁴ note, the GDP measure fails to measure accurately even economic performance, let alone other crucial dimensions.

This research paper surveys recent research results on this key question, and examines some creative alternatives to conventional, historic GDP 'national accounts'.

Origins of GDP and the National Accounts

World war and global depression are each crisis events that powerfully impact both economic theory and economic measurement. The Great Depression, 1929-1939, and the need for effective policies to overcome it, led US experts to develop measures of national income. It was recognized that the main measure of economic success at the time, the Dow-Jones stock index, was inadequate.

The US Dept. of Commerce asked the leading American economic think tank, the National Bureau of Economic Research, to provide estimates of national income. [Giovannini & Rondinella, 2018, p. 2⁵, see also Giovannini, 2015⁶]. NBER scholar Simon Kuznets had already worked on this issue. He presented to the US Congress, in 1934, the initial formulation of national income (Kuznets, 1946)⁷. (Kuznets won the Nobel Prize for Economics in 1971). And by the end of the 1930's, GDP and the related system of national accounts had a robust theoretical framework and measurement system. The national accounts were closely related to the familiar business accounts – profit and loss statements - long in wide use. [Maital & Seshadri, 2010, p. 128-139]⁸.

Meanwhile, in the UK, economists confronted another crisis. As Britain faced war with Nazi Germany in 1939, the question arose, what is the magnitude of the resources available to prosecute what will be a long, protracted conflict? J.M. Keynes⁹ provided an answer, first in *The Times of London* and later in a small book, *How to Pay for the War*, published in 1940 (Maital, 1972)¹⁰. He used the national accounts to provide an answer. Calculate gross national income GNI, he wrote. Subtract the minimum level of personal consumption needed to sustain the population C. Subtract the minimum level of capital formation needed to sustain economic production I_g . Add the maximum amount of imports we can obtain, using limited foreign exchanging and where possible borrowing IM. Subtract the minimum level of exports needed to raise the foreign exchange needed to buy weapons X. Subtract the minimum level of civilian public services to sustain the population G_c , This equals the resources available for defense spending G_d . In modern terminology:

$$G_d \equiv GNI - C - I_g + IM - X - G_c$$

Keynes' book revealed Britain's paucity of war resources, and the looming danger of inflation, when budget deficits and expanding credit financed the war through inflation

– which, Keynes noted, was how Britain paid for World War I. He called for compulsory saving and higher taxation. ⁱ

Today's system of national accounting remains largely as Kuznets and Keynes shaped it. It is obsolete; Kuznets himself warned as early as 1934 that GDP could not be considered as a measure of economic welfare “unless the personal distribution of income is known... measures of national income are subject to...abuse ...since they deal with matters that are the centre of conflict of opposing social groups.”

Balestra et al. (2018)¹¹ affirm as well that “although GDP was never designed to measure social or economic welfare, for decades it has enjoyed supreme status as the predominant benchmark of economic and social progress”.

GDP, it is widely agreed, needs radical reform. What then lies beyond current GDP measures?

Beyond GDP

A very large number of macro-economists are seeking answers to this question: “How can we develop a methodological and measurement framework to account for well-being of nations?” [Munda, 2015, p. 403]¹². It is widely recognized that a multi-dimensional approach will be needed, one that covers at least eight different measures: material living standards, health, education, personal activities, political voice and governance, social connections and relationships, environmental conditions, and insecurity (economic, physical).

Under the multi-dimensional approach, a country might have strong income, bad environment, high level of healthcare, poor governance. A valid measurement system must stem first from objectives (the desired direction of changes) and then from practical indicators showing how policy options impact the objectives. “Since in general,” Munda notes, “objectives are in conflict [i.e. trade-offs exist], multi-criteria ...rules look for so-called compromise solutions.” [Munda, 2015, p. 405]¹².

Maital (2014)¹³ offers a graphic portrayal of a multi-dimensional system, using so-called ‘radar’ diagrams to measure Israel’s strong science & technology and innovation ecosystems, but weaker environment & energy, society government & education, and economy dimensions. [See Figure 1].

Multi-dimensional measures have major advantages, but one large disadvantage – a higher degree of complexity. Year-to-year GDP growth is a single figure that is easy to understand and define (the real rate of increase in the goods and services that the economy produces), and in a sense is understood as the body temperature of the economy – warm, hot, or cold. Multi-dimensional measures can be confusing. Recently at the Madrid climate change conference, experts presented 36 measures of climate change – six showed improvement, thirty showed decline. This leaves room for fierce

ⁱ Note the triple bar, indicating ‘identity’; all the national accounts definitions are identities, since they hold true by definition; they are not equations, which in some circumstances may not hold.

debate whether the situation is getting better, worse or unchanged, depending on the weights each measure is given.

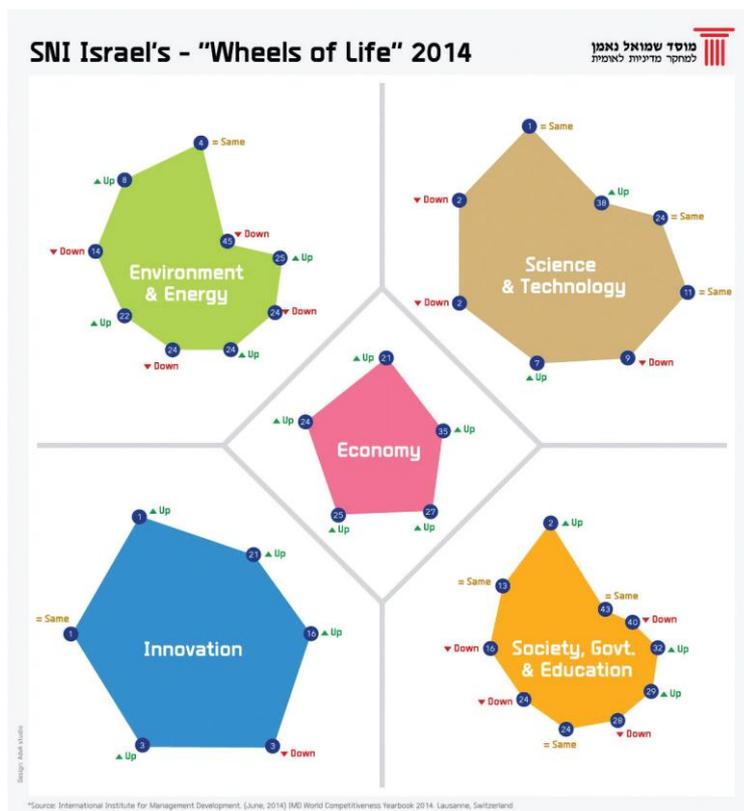


Figure 1: The Wheels of Life index showing Israel's performance in five dimensions relative to other nations

Aitken (2019)¹⁴ quotes the late Robert Kennedy, who remarked in 1968 that “GNP measures everything in short, except that which makes life worthwhile.” (p. R3). He cites the Stiglitz-Fitoussi Commission (Stiglitz et al., 2010)¹⁵, established by the French government in 2008, which argued for shifting “from measuring economic production to measuring people’s well-being”. This shift is revolutionary, because economic production is objectively measurable, while well-being by definition is subjective, about how people feel. Aitken notes the ‘dashboard’ approach, a multi-index visual measure, and recommends ‘downgrading’ GDP, to give more attention to measures that “better reflect the heterogeneity of people’s experiences”.

Hayden & Wilson (2017)¹⁶ cite at length Donella Meadows, co-author of *Limits to Growth*, who observed: “changing indicators can be one of the most powerful and at the same time one of the easiest ways of making system changes – it does not require firing people, ripping up physical structures, inventing new technologies, or enforcing new regulations. It only requires delivering new information to new places.” This idealistic view underestimates the enormous inertia that reforming GDP encounters.

More realistically, the authors observe that in the event of secular stagnation (slow or zero GDP growth) political leaders may be more willing to shift to alternate measures

that make them look better. Perhaps the current global growth slowdown qualifies for this scenario.

Maturo et al. (2019)¹⁷ take a statistical approach, employing functional data analysis (FDA) ⁱⁱ to construct social indicators for Italy, that aim to measure “equitable and sustainable well-being”. They note that this approach can capture “uneven local development”, a crucial issue for Italy and its North-South dichotomy.

Kovacic et al. (2015)¹⁸ stress the issue of ‘reflexivity’ – assessing the quality of indicators in terms of their relevance and usefulness, which in turn requires consideration of the “social and political context in which they are used.”

Measuring Socially Sustainable Growth

A subtle but hugely significant change has occurred in the terminology of the global climate change dialogue. Climate crisis is now the watchword. This, in turn, has shifted economic policy debate from an obsessive focus on GDP growth, to measures that better reflect the environmental harm done when the negative byproducts of GDP are blithely ignored.

Fioramonti et al. (2019)¹⁹ flatly call for “abandoning the Gross Domestic Product as the key indicator in economic policymaking The Sustainable Development Goals require policymakers to promote ecosystems, promote greater equality and focus on long-term equitable development”.ⁱⁱⁱ (See also Lepenies, 2019)²⁰. While Economic Growth is one of the 17 goals, so is Responsible Consumption and Production.

Coscieme et al. (2019)²¹ focus on the European Union reject the GDP measure entirely and argue vigorously that “choice of the ...GDP per capita as an indicator for Sustainable Development Goal #8 contradicts the evidence that limitless economic growth is not possible on a planet with finite resources....pursuing unconditional GDP growth risks failing to achieve the Sustainable Development Goals overall.”

If GDP is rejected, even as one of 18 measures, what could replace it? Nahman et al. (2016)²² propose a composite index for measuring green economic performance, based on 26 indicators “across the economic, social and environmental dimensions”. The authors note their index allows for ‘disaggregation’, so that “specific concerns can easily be identified and addressed and progress in each area measured over time”. The authors use a visual presentation of the composite index, as a ‘radar’ diagram,

ⁱⁱ **Functional data analysis** (FDA) is a branch of statistics that analyzes **data** providing information about curves, surfaces or anything else varying over a continuum. In its most general form, under an FDA framework each sample element is considered to be a function.

ⁱⁱⁱ The Sustainable Development adopted by the United Nations are “17 interconnected goals, to be achieved by 2030” and comprise: No Poverty, Zero Hunger, Good Health and Well-being, Quality Education, Gender Equality, Clean Water and Sanitation, Affordable and Clean Energy, Decent Work and Economic Growth, Industry, Innovation and Infrastructure, Reduced Inequality, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land, Peace and Justice, Strong Institutions, Partnerships to achieve the goals.

similar to Maital (2014)¹³ but aggregating all the indicators in a single visual, for South Africa, with #1 ranked Switzerland as the benchmark. (See Figure 2, adapted from the original).

Kalimeris et al. (2019)²³ focus directly on the core political economy dilemma – “increasing [social] welfare appears to require a disproportionate use of resources. Strong and increasing dependency on resources at the global level and in giant countries such as China and India may have serious implications for current sustainability policies...”. As highly-populated poorer countries strive for higher per capita income, they reject wealthy countries’ demands for stronger environmental policies, claiming it is up to wealthy countries to accept disproportionate constraints on production. The authors offer an optimistic finding (p. 12): “at the global level an increase in the use of resources by 96% between 1980 and 2009 induced a 153% growth in welfare as estimate by GDP. In effect, sustainability appears to be feasible, given the efficient use of resources induced by suitable policies *not much different from those currently prevailing.*”

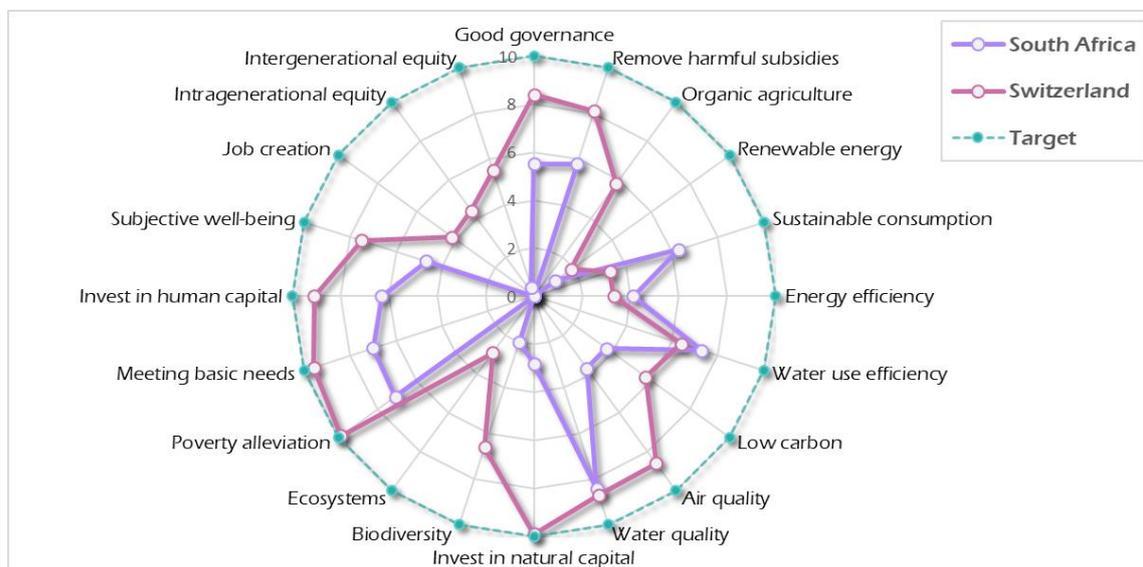


Figure 2: The 2013 Green Economy Index scores for South Africa and Switzerland

Measuring Local Performance

GDP generally measures economic production and consumption at the national level. But often local governments, at the level of province, state, and city, also seek to measure their performance.

Hidayat et al. (2019)²⁴ build an “indicator that measures ...well-being subjectively” for that is “beyond GDP”. They do this for Bandung, Indonesia’s fourth-largest city, with over 2.5 million population. They use the framework of the American Customer Satisfaction Index and other Happiness indexes. They find that the aspects of life “that have the highest contribution [to happiness] are employment, social affairs and

harmony family.” As with many such studies, the main result is that subjective well-being extends to aspects of life far beyond economic measures of income and consumption.

Mushongera (2017)²⁵ constructs a graphical “Gauteng City Region Social-Economic Barometer”, for a province of South Africa, population 15 million, and also finds, using the Barometer, that “high levels of GDP do not necessarily mean good quality of life.” The Barometer takes a systemic approach to evaluating wellbeing, comprising a wide variety of indicators, while GDP indicators are only one of many.

Berik (2019)²⁶ evaluates the “Genuine Progress Indicator”, a leading alternative to GDP, a multi-dimensional ‘dashboard’ approach. “The main obstacles to widespread use of GPI”, the author notes, “is lack of political leadership and institutional support”.

Hayden et al. (2018)¹⁶ seek to measure the State of Maryland’s “genuine progress”, using the Genuine Progress Index, measured there since 2010. The latest GPI version comprises 12 main indicators, including “market-based wellbeing”, non-market-based wellbeing, and environmental and social costs. They find that Maryland’s Gross State Product, \$210 b. in 2010, was 50% higher than its Genuine Progress Index, at \$150 billion, driven largely by growing income inequality. The authors observe that in Maryland “steps were taken not only to produce a new indicator but also to explore ways to use it in policymaking”.

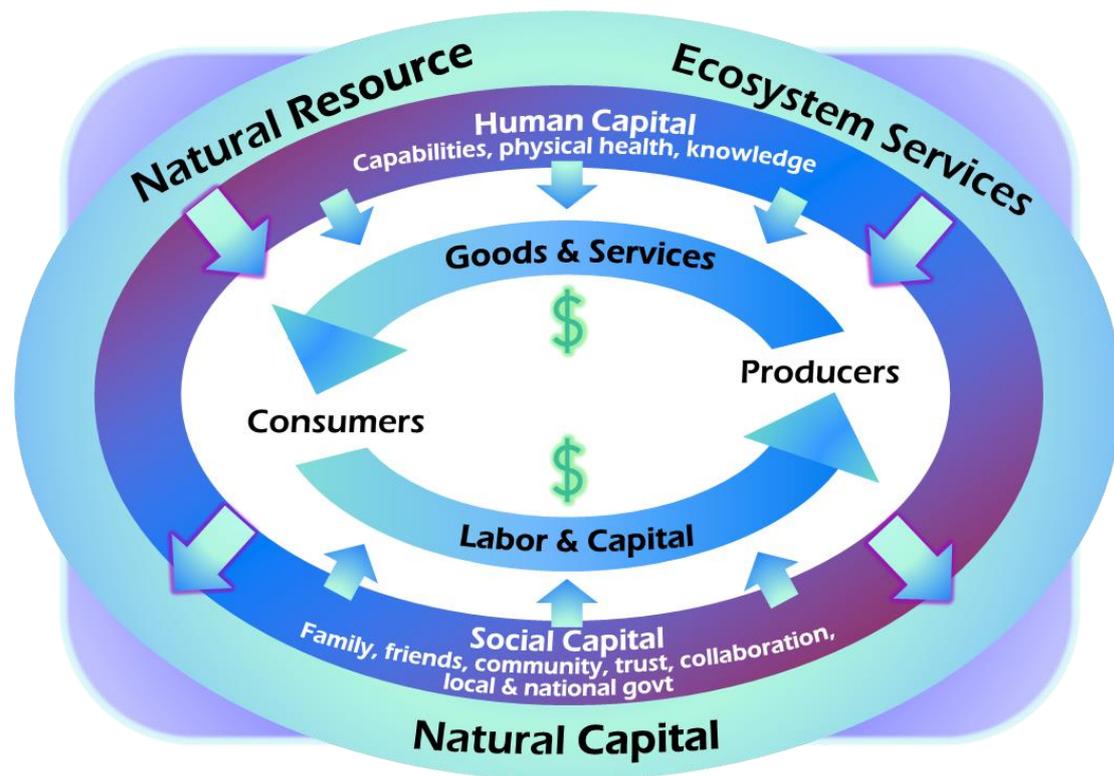


Figure 3: View of economy as part of a large system

How People Feel: Measuring Wellbeing

Economic research has for two decades transformed into a more behavioral approach; nine Economics Nobel Prize winners since 2001 have been behaviorist or sympathetic to it.^{iv} One result has been a shift from ‘objective’ GDP measures to subjective measures of welling and happiness.

Cavalletti and Corsi (2018)²⁷ search for evidence of “policy-controlled factors that might be major determinants of national average subjective well-being. Their rather complex paper uses ‘partial order methods’. Their important conclusion: “GDP, taken alone, explains little of subjective well-being variability across countries”.

Jorgenson et al.(2017)²⁸ defend the use of real household consumption per capita as a well-being measure but offer major improvements, adjusting it by the number of household equivalent members, more precise price deflators, using survey data for consumption categories, and introducing a social welfare measure reflecting both ‘efficiency’ and ‘equality’ (how resources are distributed across families).

Boarini et al. (2017)²⁹ build a welfare measure that includes household consumption, unemployment and life-expectancy, valued from two sets of data -- subjective life satisfaction data and subjective utility functions. They employ the concept of ‘shadow prices’, that reflect the real value of each component of their welfare measure. Both sets of subjective data, they show, are broadly consistent with one another.

Allin and Hand (2017)³⁰ join a large group of scholars, in proposing a systematic methodology for constructing “beyond GDP” measures, but pragmatically suggest “greater branding and marketing of national well-being concepts to promote measures and support their use”.

One problem with well-being measures is the difficulty in cross-country comparisons - comparisons that GDP handles with ease, as all nations use the same set of national accounts definitions. Jones & Klenow (2016)³¹ measure well-being as a composite of consumption, leisure, mortality and inequality. They find that their welfare measure is highly correlated with GDP per capita, but find that “deviations are often large”. Morality is the most important component accounting for such deviations; “Western Europe looks considerably closer to the US, emerging Asia has not caught up as much, and many developing countries are further behind.”

Per capita GDP is by nature an aggregate measure. Yet how national output and income are distributed among families clearly plays a key role in subjective well-being. Decancq and Shokkaert (2016)³² propose a measure of ‘equivalent incomes’, that includes inequality. They find that “introducing inequality aversion [to the well-being measure] and including other dimensions in the analysis leads to a remarkably different perspective on the growth of well-being in Europe”. They conclude: “Justice remains important in society even if only a minority of the population care about it.”

^{iv} Akerlof, 2001; Kahneman, 2002; Smith 2003; Schelling 2005; Shiller 2013; Thaler 2017; Banerjee, Duflo and Kremer 2019.

The United Kingdom has been a pioneer in 'beyond GDP' well-being measures, reflecting Keynes' early leadership in developing the national accounts system. Everett (2015)³³ recounts the "Measuring National Well-being" program in the UK, that began a decade ago, in 2010. A wide variety of government ministries is included, showing the importance of early involvement of government in shaping new well-being measures. The program began uniquely with a six-month national debate "asking people 'what matters' in order to understand what should be included in measures of national well-being".

Allin (2015)³⁴ directed the above-mentioned UK well-being program, and notes optimistically that "we appear to have reached the stage where the publication of robust measures of well-being, including subjective well-being, by national statistical offices and international organizations is becoming accepted as part of their regular outputs". He pleads that "engaging with the new ways of measurement [can help]...build better lives for all of us and for the generations who will follow us." (p. 406)

But Austin (2016)³⁵ provides a stiff critique of the 'hegemony of happiness', arguing that subjective well-being "has questionable legitimacy as a summary indicator of the objective quality of life, and does not, on its own, provide a reliable metric for public policy. Instead, she suggests a "capabilities" approach, based on prioritizing freedom and opportunity.

Conclusion

Economists face a major hurdle in revising how they measure economic performance. Use of the simple single-measure GDP growth index is widespread. There is enormous inertia that hinders changing how we measure social policy. Expanding the narrow unidimensional GDP measure necessarily adds complexity, and also controversy – if more than one measure of performance is chosen, which of the many composite variables should be included, and why? And atop all this is the key principle: Measurement drives management. How you measure something will drive how you manage it – so politics and ideology enter into the measurement debate, once the widely-accepted single-number GDP index is abandoned.

The current prevailing wisdom on social and national accounts is chaotic. The flaws of GDP are widely recognized, there are numerous alternate composite criteria, but none are widely used and accepted. GDP continues to be the performance measure of choice, along with the unemployment rate, which too is highly flawed – it does not reflect either discouraged workers (who opt out of the labor force) and treats employment in minimum-wage fast-food jobs the same as employment in high-wage manufacturing jobs.

Malay (2019)³⁶ confirms that "...despite this proliferation of Beyond GDP indicators, all of them have failed to become institutionalized, with the exception of HDI [Human Development Indicators] in certain countries." He proposes "aligning the [new] indicators' conceptual and methodological framework with those of powerful stakeholders." (p. 100). This emphasizes that in the end, the way performance is measured is a political decision and hence driven by interests and ideology.

The political nature of GDP is stressed in a book by Fioramonti (2016, 2017). In Fioramonti (2016)^{37,38}, he stresses that “as countries move beyond GDP and new indicators are introduced, the overall international political order may also change.” Why? Because GDP-oriented institutions like the World Bank and International Monetary Fund, and the World Trade Organization, may become supplanted by institutions with broader horizons. Fioramonti (2017)³⁸ envisages a post-GDP world where small businesses, households and civil society have new important roles, and where democracy itself and international relations evolve and change.

Out of this chaos, there may one day soon emerge a clear consensus on a performance measure or measures. It cannot come too soon.

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