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Article

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Gross domestic product: Are other measures needed?

GDP summarizes only one aspect of a country’s condition; other measures in addition to GDP would be valuable

Keywords: GDP, macroeconomic measures, national income accounting

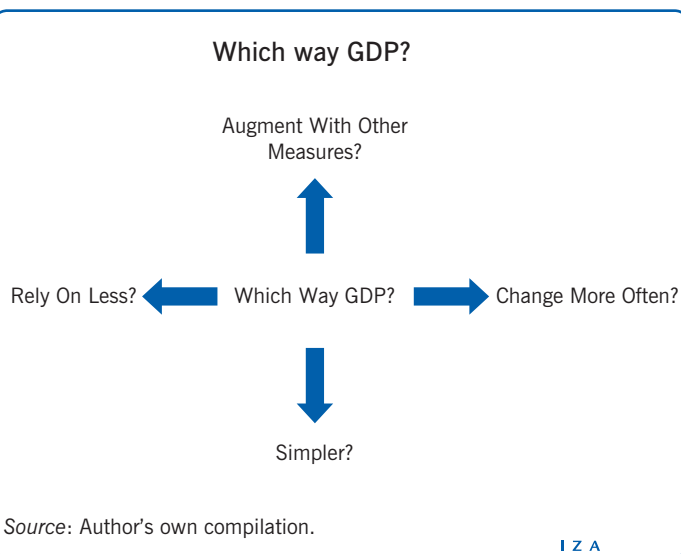
ELEVATOR PITCH

Gross domestic product (GDP) is the key indicator of the health of an economy and can be easily compared across countries. But it has limitations. GDP tells what is going on today, but does not inform about sustainability of growth. The majority of time is spent in home production, yet the value of this time is not included in GDP. GDP does not measure happiness, so residents can be dissatisfied even when GDP is rising. In addition, GDP does not consider environmental factors, reflect what individuals do outside paid employment, or even measure the current or future potential human capital of a country. Hence, complementary measures may help to show a more comprehensive picture of an economy.

KEY FINDINGS

Pros

- + GDP provides a headline number to focus on the economic condition of a country.
- + GDP is the mainstay of modern macroeconomic analysis and essential to policy creation.
- + Because GDP conforms to international measures of production, it is an objective indicator that is not subject to national political pressures.
- + In most cases, GDP uses well-established international accounting principles.
- + GDP concepts are modified as the economy changes.



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Cons

- GDP does not capture welfare or human well-being.
- GDP may not be a strong basis to predict economic growth in times of high uncertainty.
- As international accounting standards are slow to change and require international consensus, GDP is slow to reflect changes in the world.
- GDP excludes nonmarket activity, notably human capital creation in that sector.
- Important indicators such as ecosystems, pollution, climate change, or green GDP accounts, measures of happiness, sustainability, inequality, or nonmarket accounts are not included in GDP, other than possibly through satellite accounts.

AUTHOR’S MAIN MESSAGE

GDP is the single most important indicator of the overall state of an economy and should be retained. It is a standardized measure across countries, and is relied upon by policymakers to determine whether action is needed to reduce inflation, or to stabilize or grow the economy. However, GDP should be one of a suite of measures. It is unlikely that accounts and measures supplementary to core GDP accounts will give a good sense of a country’s future, in part because national income accountants try to avoid making risky, assumption-laden, normative choices, or speculation about what the future might bring.

MOTIVATION

Gross domestic product (GDP) measures a country's market economic activity, or total market output; ignoring nonmarket activities and the state of the environment. GDP is a "neutral" measurement, in that it makes no judgments about what is good or bad economic activity—it is simply the market value of whatever is currently produced in a country. For example, weapon manufacture is counted as part of GDP and environmental damage during production is not deducted from GDP. According to GDP, even natural disasters, military conflict, and acts of terrorism can increase growth. For example, following the May 2008 earthquake that struck Sichuan Province in China, in which at least 80,000 people died and which left the area in ruin, Chinese authorities maintained that, "on net," this led to economic growth [1]. Property destruction resulting from natural disasters is not deducted from GDP, although reduced expenditures, personal income, and business income lower GDP. As the incidence of natural disasters and extreme weather seem to be increasing with climate change, it is important to note the incidence of this GDP anomaly. Finally, even with regard to market economic activity, since GDP concepts and methodology are slow to be revised, GDP may not accurately reflect a rapidly changing state of the world.

So, given the above, why is GDP considered to be the key indicator of the health of the economy? GDP does well in capturing what it intends to measure. It focuses mainly on the easily measured and tangible elements of the economy: what is bought (consumption and investment) and spent (government). But as a comprehensive measurement of a country's overall state of economic and environmental health and social well-being, it leaves a lot to be desired.

DISCUSSION OF PROS AND CONS

The creation of GDP

The Great Depression and World War II stimulated the creation of Gross National Product (GNP), the forerunner of GDP. The 1937 US national economic accounts, the first GDP-like accounts, were created under the leadership of Simon Kuznets, following the Great Depression, when it was realized that there was scant data on which to base economic policy [2]. Subsequent to the 1944 Bretton Woods conference, GNP or GDP became the international standard for assessing a country's economy. GNP includes all goods and services produced by a country's residents, regardless of where they are produced, whereas GDP includes only goods and services produced in the country. One of the reasons for the difference between these two measures is the existence of multinational companies which operate in more than one country.

The relevance of GDP to policy

For most individuals, one headline number, typically quarterly or annual growth in GDP, is more than enough to focus on when considering the economic condition of a country. Is the economy getting better or worse, and is growth higher or lower than usual? Analysts, researchers, and policymakers, however, need to understand and appreciate the details and trends behind the GDP figures to a much greater extent. For example, growth often fluctuates, and it is future trends that are most important to capture in sustainability analysis.

The US as an example of GDP policy process

GDP is a central input to policy making in the majority of countries in the world. The policy making process in the US, for example, typifies, in general terms, what happens in the policy making arena for most countries in the world. The Chair of the US Federal Reserve, who is responsible for monetary policy, carefully examines with advisors GDP components and other measures, such as labor force statistics, to inform decisions. The Council of Economic Advisors (CEA) and the National Economic Council (NEC) are bodies that advise the US president on economic policy. The Joint Committee on Economic Policy (JCEP) and the Joint Committee on Taxation (JCT) are two of many US Congressional Committees that closely monitor growth in GDP, as they consider legislation that can have an impact on the economic condition of the country. In fact, it has been suggested that the creation of the US GDP accounts has moderated swings in economic activity because these accounts led to a better understanding of current conditions [2].

National income accountants, who estimate GDP, follow a rigorous and detailed set of accounting standards in compiling GDP: the System of National Accounts (SNA) [3]. The SNA principles are followed by national statistical offices (NSOs) around the world. Although the US has another set of standards embodied in the National Income and Product Accounts (NIPAs), the NIPAs closely conform to the SNA standards in order to ensure comparability, although its format is quite different. Developing countries may not have the resources, in terms of qualified experts and finance, to fully implement the SNA, as its current 2008 manual is over 700 pages long and very complicated, even for the expert.

The System of National Accounts (SNA)

The SNA is an international standard system of national accounts. It is maintained by the UN, the International Monetary Fund, the World Bank, the OECD, and the Statistical Office of the European Communities.

The SNA is a guide on how to provide an integrated, complete system of accounts to allow for international comparisons. Countries conform to the SNA standards to varying degrees, but typically country aggregates can be reworked so that they are very similar to the SNA aggregates.

In most countries, the national income accountants are not allowed to engage in policy creation, discussion, or analysis. If national income accountants engaged in such activities, they might be tempted to, or be perceived to, fashion GDP to serve their personal or political preferences. In the US, the agency that estimates GDP—the Bureau of Economic Analysis (BEA)—has no political appointees. Political office-holders, such as the US president or secretary of commerce, who may have access to the GDP numbers through the CEA before they are released, are not allowed to comment on the numbers in any way until after they are released to the public. Strict security measures are enforced to ensure there are no early leaks of the GDP number or of its components. BEA employees have to achieve the highest standards of impartiality and secrecy in estimating GDP. The practices of a number of countries around the world, albeit with some variation, reflect this structure and process.

How measuring GDP has changed

Elements of the economy that are tracked in GDP have changed significantly since the 1930s. Countries determine what GDP changes to make and when to make them. For example, for the US, there have been many changes in definition, classification, source data, and methodological approaches. Since the mid-1980s, many analysts have been concerned with price or quality changes, such as hedonic price indexes for computers (that capture the changing value of component parts and characteristics) and the implementation of indexes to better capture inflation and quality-adjusted changes. Other changes include the classification of software and research and development as investment, separation of government expenditures into consumption versus investment, and measurement of implicit services provided by property and casualty insurance and by commercial banks. Each year in the US, at the end of July, an annual revision of GDP occurs; some definition, classification, source data, and methodological changes occur at this time, but major changes occur every five years as part of a comprehensive revision. Data are revised back through time to ensure comparability of historical figures. Over time, because of an initial different set of accounting standards, the US system has become more similar to the SNA. The EU publishes its own set of methodology guidelines, which also may not be identical to the SNA because of timing or other issues.

The SNA changes infrequently because it requires the agreement of a large number of countries through an advisory process. An important concern is the extent to which poor or less-developed countries can implement proposed changes. The SNA was created under the leadership of Sir Richard Stone and was first published in 1947. Since then, six new versions have been published, in 1953, 1960, 1964, 1968, 1993, and 2008. The 2008 version is an update of the 1993 SNA manual [4]. Currently discussions are underway regarding a future revision of the SNA.

Alternatives to GDP as a comprehensive measurement

There have been significant criticisms of GDP over the last years. The Stiglitz-Sen-Fitoussi Commission, which popularized the buzzword “beyond GDP,” is clearly the primary example of critical evaluation, and was created by the former president of France, Nicolas Sarkozy, in 2008 [5]. Its report calls for substantial innovation in economic accounts, including GDP. A strong emphasis of the report is a switch from production-based measures to measures focusing instead on income and consumption. The report concludes that material living standards are more closely associated with measures of real income and consumption than with GDP. Sometimes production expands or contracts without a commensurate expansion or contraction in material living standards, as GDP does not include income flows in and out of a country or adjust for depreciation. In addition, there may be consequential differences in consumers’ prices versus the price of GDP. It was thought that such a switch, with underlying household detail and with companion wealth and income distribution measures, would facilitate the construction of measures of income distribution, inequality, and poverty.

The Stiglitz-Sen-Fitoussi Commission therefore recommended that material living standards should be tracked on a household basis, with accounts considering ingoing and outgoing financial payments, including payments and any “in-kind” benefits or services. Nonmarket activities were thought to be best captured through “satellite accounts” to the

The Stiglitz-Sen-Fitoussi Commission

In February 2008, Nicolas Sarkozy (then president of France), unsatisfied with the present state of statistical information about the economy and society, asked Joseph Stiglitz (president of the commission), Amartya Sen (advisor), and Jean Paul Fitoussi (coordinator) to create a commission: The Commission on the Measurement of Economic Performance and Social Progress (CMEPSP). These three individuals were joined by 22 other commission members.

The commission's aim was to “identify the limits of GDP as an indicator of economic performance and social progress, including the problems with its measurement; to consider what additional information might be required for the production of more relevant indicators of social progress; to assess the feasibility of alternative measurement tools, and to discuss how to present the statistical information in an appropriate way.”

Source: Stiglitz, J. E., A. Sen, and J.-P. Fitoussi. *Report by the Commission on the Measurement of Economic Performance and Social Progress* (2009). Online at: http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf

GDP accounts, with services provided, time used, and home-production goods included, particularly as the latter can be very important for developing countries. In contrast, the report recommends indicators as opposed to monetary or numerical measures, in almost all regards, when considering societal well-being and sustainability (i.e. economic, environmental, and social sustainability, and their interlinkages). The exception is a call for surveys that ask individuals to subjectively and objectively describe their quality of life and priorities and measures that capture social capital, inequities, and the relationships between personal quality of life dimensions. However, statistical offices were asked to provide enough information so that an index could be constructed to capture these well-being features. The conclusion is that sustainability should be presented in a “dashboard” of indicators, in which monetary measures should be given a secondary role because of the difficulty of constructing them. The environment and environmental considerations are also suggested to be part of this dashboard.

In addition to “beyond GDP,” there are a number of alternative measures of GDP that have been developed as a result of a perceived overreliance on it, or as a preference for yardsticks that emphasize economic growth to a lesser extent, or even not at all. The UN's Human Development Index (HDI), which has been published since 1990 and covers over 200 countries, is perhaps the best known. It currently includes gross national income (GNI) per capita, although formerly it included GDP per capita. GNI is an important companion to GDP, from the “other” side of the accounts, as it captures actual or imputed income to individuals, businesses, and other entities. Similar to GNP, it also looks at market activities of all residents (nationals) of a country, but for income as opposed to product. GNI is an SNA concept (as is GDP), which excludes net taxes on production and imports. Unlike GDP, GNI includes income flows in and out of countries. These flows are the main difference between GDP and GNI. Accordingly, a country's GNI is typically larger than its GDP if income inflows are greater than income outflows, for example reflecting multinationals' activities in other countries. The HDI has three major components with equal (geometric mean) weights: long and healthy life (life expectancy at birth), knowledge (expected years of schooling and mean years of schooling), and a decent standard of living (GNI in international dollars per capita) [6]. The first two

are forward-looking measures to give policymakers an indication of the future of a country. The latest HDI report added an experimental planetary pressures measure, to go along with its basic, inequality-adjusted, gender development, gender inequality, and multidimensional poverty indexes.

Happiness is another possible measure. The most recent World Happiness Report, published in 2021 by the UN Sustainable Development Solutions Network, describes happiness measures for 149 countries. Six factors, comprising levels of GDP, life expectancy, generosity, social support, freedom, and corruption, are sub-components of the happiness measure [7]. Generosity is measured by: recent donations; social support (having someone to count on in times of trouble); and freedom (perceived freedom to make life decisions). Survey respondents are asked to give their subjective ratings of happiness on a scale from zero to ten; it has been shown that these rankings can be linked to variations in the six factors listed above. The latest report is an update in a series that started in 2012. As well as describing the overall country happiness measures, the recent report describes the levels of happiness inequality among countries and within countries and regions.

Nevertheless, however important, neither the HDI, the World Happiness measures, nor the SNA satellite measures receive anything like the attention from policymakers that is paid to GDP. This is because the predominant focus for policymakers is on economic growth, as opposed to other, equally, if not more, important (but certainly complementary) considerations.

Revise GDP?

Some researchers and commentators concentrate on possible revisions to GDP as opposed to alternative measures. In a recent book, the history of the development of GDP is summarized, the difficulty of coming up with an accurate measure is described, and some revision suggestions are made, from the standpoint, nonetheless, of a belief in the GDP measure as a “bright light shining through the mist” [8].

The overall conclusion of this book is that a new way for thinking about “the economy” has to be designed, for three reasons: (i) its increasing complexity; (ii) the increasing share of components that are difficult to measure, specifically services and intangibles, and the impact of climate change; and (iii) the importance of quantifying depreciation and depletion of assets to assess sustainability [8].

The International Association for Research on Income and Wealth (IARIW) conference in 2015 (“W(h)ither the SNA”) brought together many practitioners in the art of constructing GDP and other researchers. There were at least three points of view expressed. One view was that GDP should be substantially replaced and changed, as it does not measure welfare in a way that includes environmental and social measures (such as income distribution, inequality, and the contribution of unpaid work). Another view called for keeping the basic framework “as is,” but to add to it similar measures as listed above, plus to add to it constructs reflecting globalization and the greater importance of intangibles (such as research and development, brand equity, and human competency). The other view was to leave GDP “as is,” without substantial changes or additions. Also, in part, the discussion at the conference highlighted the frustration of some with the

difficulty and slow pace of making substantial changes to the SNA; but on the other hand it demonstrated the extent to which developing countries have consistently found it difficult to implement.

Benefits of using GDP “dashboards”

Dashboards can present a variety of indicator measures (often significantly more than five), and sometimes these measures are weighted to construct a summary measure. HDI's three major components are combined with equal (geometric) weights. Its summary measure is frequently criticized by those who say its weights are arbitrary. Decisions about weights, by nature, are always subjective, rather than objective. It is uncertain to what extent policymakers and others rely on dashboards, but they can be a very useful source of information.

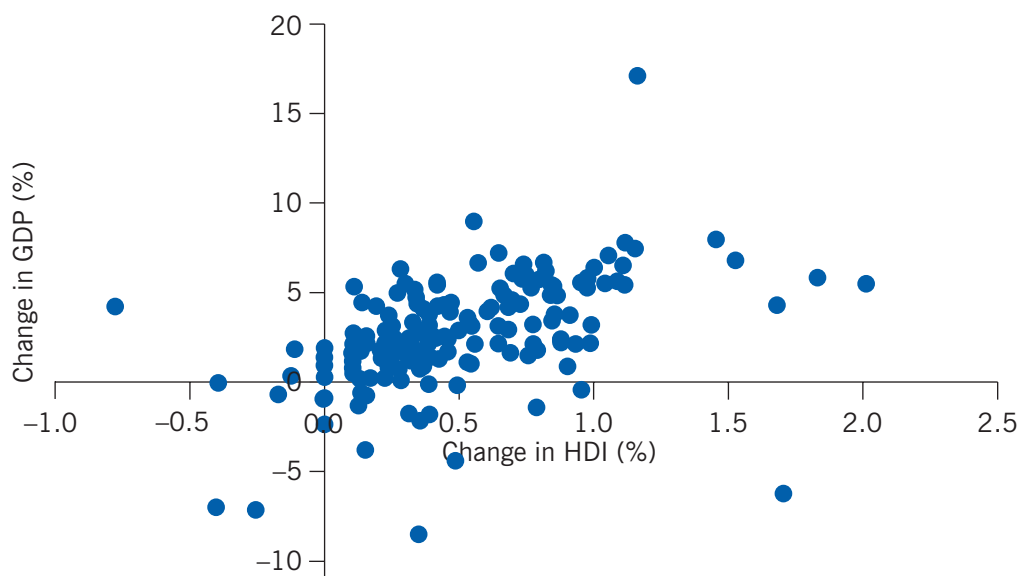
The compendium produced by the OECD's “Better Life Initiative” allows users to create their own weights for 11 topics of current well-being and four topics of future well-being to form an overall indicator based on their own subjective preferences [9]. There are four indicators of future well-being: natural, economic, human, and social capital. It concentrates on the well-being of individuals in up to 40 countries, rather than the macroeconomic conditions of their countries.

Dashboards are difficult to use to evaluate progress. However, unlike GDP, which implies that growth is always good and the supreme target of a country, other critical aspects of a country are importantly being recognized.

GDP, HDI, and World Happiness measures

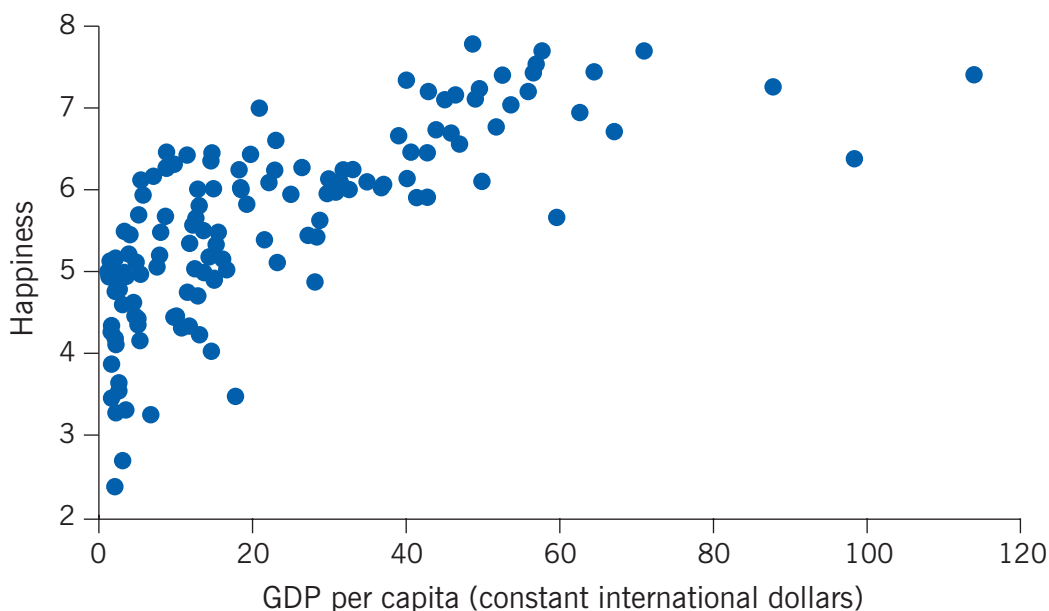
To what extent do the HDI and World Happiness measures differ from GDP, and HDI with or without planetary pressures, differ from each other? Figure 1 shows the logarithmic percentage change in the HDI versus the logarithmic percentage change in constant price GDP, between 2018 and 2019, for 181 countries. Percentage changes are shown in the graph because most attention is paid to GDP rates of growth—rather than to the absolute level of GDP or to GDP per capita—by policymakers and by the public press. Visually it shows, as statistical tests confirm, that overall there is a moderate relationship between the rates of growth of the two different measures, as the relationship is fairly strong for a number of countries, but very weak for others. (The correlation coefficient is 0.47.) However, there is a strong correlation between the overall HDI and its knowledge component [6]. Figure 2 charts for 2019 the World Happiness measure versus constant 2017 purchasing power parity (PPP; international dollars) GDP per capita, for 135 countries. In this figure, there is a closer correspondence between happiness and constant 2017 PPP GDP per capita than between the percentage change in the HDI versus the percentage change in constant price GDP; however, the former relationship is non-linear. The World Happiness measure is reasonably well explained by constant 2017 PPP GDP per capita. (The correlation coefficient is 0.72.) As shown in Figure 3 for 169 countries, the planetary adjusted HDI is substantially lower for countries with the highest HDI scores. For example, Norway's HDI ranking, whose 2019 HDI score is highest, is lowered by 15 after a planetary pressures adjustment. The largest planetary adjustment demotion is for Luxembourg, whose ranking drops from 23rd to 154th after the planetary adjustment is

Figure 1. Human Development Index (HDI) and GDP change (2018–2019)



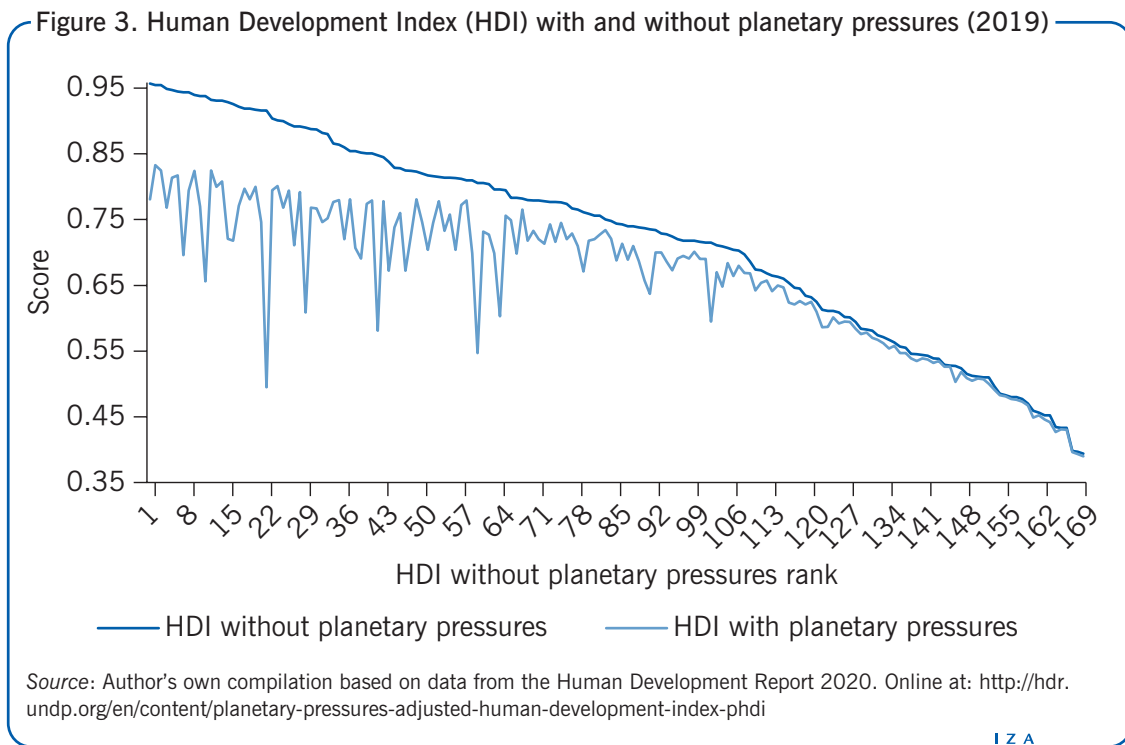
Source: Author's own compilation based on Table 2 of the statistical data tables of the Human Development Report 2020. Online at: <http://hdr.undp.org/en/composite/trends>; and World Bank, World Development Indicators. Online at: <http://data.worldbank.org/indicator/NY.GDP.MKTP.PP.KD>

Figure 2. Happiness and GDP per capita (2019)



Note: The World Happiness Index (WHI) is a subjective measure with values ranging from 0 (“completely dissatisfied”) to 10 (“completely satisfied”).

Source: Author's own compilation based on data from the World Happiness Report 2021. Online at: <https://happiness-report.s3.amazonaws.com/2020/WHR20.pdf>; and World Bank, World Development Indicators. Online at: <https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.KD>



applied (see the downward spike in the line for HDI with planetary pressures near point 22). The planetary adjustment is an average of a production-based CO₂ emissions per capita index and a material footprint per capita index.

Other alternatives to GDP

The construction of other types of accounts, besides HDI and happiness accounts, could also be useful. For example, human capital accounts based on household production or nonmarket activities could be an offshoot of micro household-level data on income and consumption. Human capital accounts, if human capital is constructed with a lifetime income measure which recognizes the contribution of individuals throughout their whole working lifetime, are an important component of sustainability considerations too.

Considerations of “time poverty,” particularly for women who historically have borne the bulk of the responsibility for caring for the young, the infirm, and the elderly are also important societal considerations. Caring time is an implicit obligation today, and will be in the future, as parents and others age. Interest in well-being has also substantially increased in recent years, in part because of the Stiglitz-Sen-Fitoussi Commission recommendations.

LIMITATIONS AND GAPS

An advantage of GDP is the extent to which it is based on tangible measures, such as the quantity of goods produced. Other measures, such as happiness, depend to a greater extent on components that are more difficult to conceptualize and assess. However,

this dichotomy is becoming less clear, as GDP itself depends more and more on the quantity of services produced and intangible elements that are estimated using more subjective methodologies than the quantity of goods produced. Additionally, even the “quantity” part of the quantity of goods produced is a less certain measure, as it is quality-adjusted to a significant degree, particularly for technology-intensive products, such as semi-conductors. Continuing and intensive research by both government and private researchers is therefore needed to maintain GDP’s accuracy as a measure of economic activity in a rapidly changing world.

SUMMARY AND POLICY ADVICE

In spite of the existence of some alternative measures, there is comparatively little press coverage or attention by policymakers on any measure other than GDP and labor market measures, such as the unemployment rate. The initial Gross National Happiness (GNH) measure of Bhutan generated enough attention such that other measures of happiness were created, but these receive little coverage. GNH’s four pillars include good governance, sustainable socio-economic development, preservation and promotion of culture, and environmental conservation [10]. Also, in recent years, much attention has been paid to the construction of well-being measures, with happiness being one component of well-being.

An important question to ask is whether the fact that GDP attracts so much attention means that it is the “right” measure? The answer to that is “no.” However, it does highlight the difficulty in replacing it with another measure, or a suite of measures. A second question is whether GDP should be replaced? Again, the answer is “no.” GDP should not be replaced; it is no more than what it purports to be, that is, a measure of the value of production. It would be best if there could be a more widespread understanding of its limitations, though this would be difficult to accomplish for any statistical measure. Also, more frequent updating or revision of the SNA would be ideal.

A third question is whether GDP should be complemented by a suite of other measures? And, if so, how could these other measures gain sufficient attention and traction to become credible and accepted? One answer would be to release an alternative or complimentary measure along with the GDP release, at least once a year. The issuing GDP agency could be assigned the responsibility for the construction of the other measures, in order to give them credibility, or they might be calculated by another body, even an international one. If the GDP agency does not construct the alternative measure, it is possible that a list of a few alternative measures could be included in the body of the GDP release, without the agency necessarily implicitly indicating their approval of the alternative measures or how they are constructed.

National income accountants may not be the ideal specialists to comment on alternative measures. In some countries, including in those for which there is one national statistical agency—as opposed to the triumvirate that exists in the US (i.e. the Bureau of the Census, the Bureau of Economic Analysis, and the Bureau of Labor Statistics)—other measures are already constructed by the same agency, but GDP still garners the lion’s share of attention, with the possible exception of labor market measures, as previously noted.

Simultaneous release of GDP with its alternative or complementary measure(s) might increase the attention paid to the other measure(s). An international task force could

be formed (e.g. by the UN Statistical Commission) to consider how to best increase the amount of attention paid to alternative measures. This would require the commitment of dependable funding from international organizations—which would of course be problematic during times of budgetary stress such as during the Covid epidemic.

Should all countries focus on one alternative measure, such as a set of household-level income and consumption accounts? The attention given to Thomas Piketty’s recent analysis of income distribution suggests that this could be a credible case, particularly in view of the fact that income distribution, inequality, and poverty numbers do seem to attract attention [11].

The World Bank produces an indicator of inequality, through its shared prosperity measure and poverty measure for over 200 countries [12]. International agencies certainly need to be responsible for the construction of such a set of household-level income and consumption accounts, as many developing countries often lack sufficient expertise, data, or funding to keep up even with the current version of the SNA. A new manual would be needed, much simpler and shorter than the SNA, that is regularly updated to keep up with the changing nature of the world.

In summary, there are three principal policy recommendations. First, to keep GDP as it is, as a measure of production, but to: (i) update SNA methodology more frequently; (ii) allow for a more simplified SNA version by countries with limited resources; and (iii) add a brief text to all GDP releases that emphasizes what is and is not included in GDP and what it represents; for example, it is not a measure of well-being or welfare. Second, to construct an income and production measure that: (i) has a household base, allows for considerations of individual well-being, human capital, poverty, income inequality, as well as perhaps “time use” and “time poverty”; and (ii) is made available along with a GDP release in the release text or a simultaneous release at least once a year. And finally, to convene an international group that includes national income accountants to consider how to raise interest in and knowledge of alternative measures to GDP.

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Competing interests

The IZA World of Labor project is committed to the IZA Code of Conduct. The author declares to have observed the principles outlined in the code.

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Further reading

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Online extras

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