



BEYOND GDP

NEW MEASURES FOR A NEW ECONOMY



Demos

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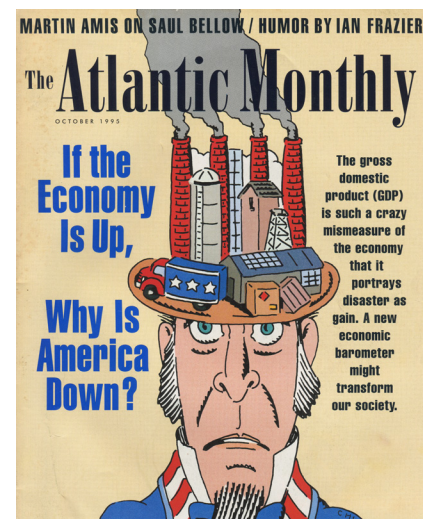
INTRODUCTION

The idea of America as a land of opportunity has always gone hand in hand with the idea of America as a land of plenty. Creating opportunity by “enlarging the pie,” rather than by “dividing up a shrinking pie,” has been a catchword in American politics for decades, strongly linking the idea of social progress with the need for continuous economic growth. Consequently, the way we think about social progress and public policy has been heavily shaped by national measures and indicators that focus exclusively on economic growth, most importantly Gross Domestic Product (GDP) and related measures of market output.

While the idea that growth equals progress has long been challenged by economists, social scientists, and cultural critics, on many grounds, the economic crisis that emerged in the late 2000s has brought the limits of GDP and of the broader growth narrative surrounding it into very sharp relief.

Across the 2000s, there was no net job creation, median family income declined, and \$15 trillion in household wealth was lost, the sharpest such decline in 50 years. At the same time, the rates of both environmental depletion and global warming continued to rise, and despite recent disasters like the Gulf of Mexico oil spill and the Massey mine explosion in West Virginia in 2010 (the worst such event in 40 years), cheap, dirty energy remains more or less untouchable in national politics. So too, there are many signs of growing social distress. Poverty is rising, and health gains have stalled and even regressed in many communities—the cost of obesity in America is closing in on \$300 billion annually. American students are falling behind their peers in Europe and Asia, and for the first time in polling history, a majority of American parents do not believe that their children will fare better than they did. Yet, even in such a “lost” decade, GDP rose nearly 18 percent, and this came on the heels of “the longest economic expansion in American history”—during the Clinton years—and before that, the “Great Expansion” of the Reagan years.¹ Between 1980 and 2010, real GDP more than doubled. Yet here we are today.

As the *Washington Post* noted in January 2010, many economists and policymakers, responding to these trends, have begun “to fundamentally rethink the underpinnings of the nation’s growth.”² Financial policy, housing policy, jobs policy,



This October 1995 cover story in *The Atlantic Monthly* called GDP a “crazy mismeasure”; in the wake of the economically disastrous 2000s, political leaders are finally beginning to acknowledge and address the problem.

education policy, energy policy—all are marked by growing concerns about long-term sustainability, assessing how we can build a “new economy” in contrast with the destructive boom-and-bust cycles, and growing inequality, of recent years. One of the brightest common threads in this emerging policy fabric is the burgeoning global movement to go “beyond GDP,” expanding our national income measures to focus on aspects of distribution, social well-being, human and public wealth, and environmental sustainability that are otherwise obscured or ignored by the GDP framework. Increasingly, new metrics in these areas are being developed and/or adopted by governments and embraced by politicians. As Nobel-laureate economists Joseph Stiglitz and Amartya Sen put it in their 2009 report for France’s Commission on the Measurement of Economic Performance and Social Progress [sometimes called the “Stiglitz Commission”], national income accounting has shifted from “the province of technicians to a subject of public discourse.” And it is easy to understand why this happened in the wake of the economic collapse, they argue:

Trying to understand what makes for good performance of a society is central to the social sciences. We see the world through lenses not only shaped by our ideologies and ideas but also shaped by the statistics we use to measure what is going on, the latter being frequently linked to the former. GDP per capita is the commonly used metric; governments are pleased when they can report that GDP per capita has arisen, say, by 5%. But other numbers can give a very different picture. In Russia, declining life expectancy suggests there are underlying problems, even if GDP per capita is rising. So, too, in the United States, most individuals saw a decline in income, adjusted for inflation, from 1999-2008—even though GDP per capita was going up—providing a markedly different picture of performance.

Stiglitz, Sen, and many other economists, amid a growing chorus of policy advocates and political leaders, have brought into focus how our reliance on aggregate measures of market activity has led us badly astray in how we prioritize public policies, understand the role of government, and evaluate political leadership. Essentially, a measure of raw economic output has become virtually synonymous with social progress, locking us on an unsustainable growth path and leaving us in the dark about many important dimensions of economic welfare, social well-being, and environmental sustainability. “The crisis is teaching us a very important lesson,” Stiglitz and Sen add. “Those attempting to guide the economy and our societies are like pilots trying to steer a course without a reliable compass.” Indeed, “the time is ripe for our measurement system to shift emphasis from measuring economic production to measuring people’s well-being.” This is necessary, they insist, because “what counts for common people’s well-being” is diverging from the “information contained in aggregate GDP data.”³

As this debate has evolved, the focus has naturally shifted to questions of policy impact: how can alternative measures be used to influence policy development, and will changing our measures change our politics as new priorities come to light? In theory, new measures can draw our attention to important problems that are ignored by or poorly reflected in GDP (e.g., much of “what counts for common people’s well-being”), and this information could motivate and help target significant policy changes, budget shifts, etc. This is obviously the hope that drives comprehensive new efforts such as the Stiglitz Commission. In the wake of the financial crisis and recession of the late 2000s, for example, it became painfully clear that GDP is a misleading indicator because (among other things) it fails to distinguish between debt-financed consumption and earnings-driven consumption, thus registering “growth” without any regard for its sustainability. The resulting collapse has spurred new thinking about the need for debt-adjusted growth metrics. In many other areas, the policy relevance of new metrics is something of a “chicken and egg” situation. The very evidence policy-makers would be looking for necessarily depends on, first, adoption and utilization of the alternative metrics. As an interim step, experimental studies that model the impact of using alternative metrics to target budget

and policy changes in problem areas could be extremely helpful, and there is growing interest in this kind of work among statistical and policy reformers.

Driven by today's significant economic challenges, political momentum for alternative measures of progress is accelerating. Both the OECD and the European Union have implemented formal programs to advance reforms in member states and across Europe.⁴ The United Kingdom is now implementing a well-being index as part of its national accounting system,⁵ and many other countries, including Canada, Australia, Germany, and the Netherlands, have pilot initiatives in various stages of development. Also important, along with these concrete developments toward implementation, is the growing prevalence of "Beyond GDP" themes and ideas in high-profile multilateral discussions. In a statement released at their Pittsburgh Summit of 2009, the G20 leaders urged the development of a "new, sustainable growth model," beginning with work on new measurement methods, "so as to better take into account the social and environmental dimensions of economic development."⁶ German Chancellor Angela Merkel's statement of April 2010, issued jointly with the heads of the IMF, the World Bank, and the World Trade Organization, among others, declared that a key lesson of the recent economic crisis was that "traditional concepts of growth" are inadequate. GDP should be complemented, she asserted, by "including appropriate social, employment, and environmental components."⁷

While the United States has lagged behind on these issues, important recent developments have sparked new advocacy and media interest here as well. In 2010, the Bureau of Economic Analysis (BEA), the federal agency responsible for national accounting and quarterly reporting of GDP, made public a broad new agenda for "GDP and Beyond" measures, including a new framework for measuring household economic welfare (further discussed below).⁸ Also, the 2010 health care reform bill authorized the development of a new Key National Indicator System for the United States, an important platform, potentially, for alternative measures of well-being and sustainability.⁹ State-level initiatives are moving forward as well. The state of Maryland, for example, has adopted the Genuine Progress Indicator (also discussed below) for integrated accounting of economic, social, and environmental conditions, and other states are considering similar approaches. As attention has shifted from technical debates to more practical questions of implementation and application in government settings, a new wave of national media coverage has ensued.¹⁰

THE CASE AGAINST GDP

GDP measures the total monetary value of goods and services produced within our national borders in a given period. Developed in the 1930s to help policymakers gauge our recovery from the Great Depression, essentially GDP is a measure of raw economic activity and was considered even by its chief architect, Simon Kuznets, to be a very poor instrument for measuring economic development, let alone social progress. But in the decades after World War II and especially in the last two decades, GDP has become synonymous with the broader welfare and progress of society, and our entire economic policy framework and economic debate have come to revolve around the goal of maximizing the growth rate of GDP. From promoting credit-fueled consumerism, to subsidies for sprawl and deforestation, to deregulating capital and financial flows, to the relentless pursuit of cheap, dirty energy with high environmental costs, GDP growth has become the unchallenged standard and guiding idea in most of our policy-making, politics, and public debate about economic development.

Yet, even as it has become the dominant economic measure and benchmark of progress, it is increasingly understood that GDP obscures or excludes essential aspects of welfare and sustainability in our economy and society, and as a consequence, greatly limits how we gauge policy needs and develop policy responses. This is not to say that GDP or the broader system of national accounts should be dismantled or ignored. Any credible reform agenda in this area recognizes that the system of national accounts provides important information about a range of economic realities, including personal income, savings, and consumption, gross and net capital formation, imports and exports, and net foreign investment; and as a summary measure, GDP is a good general barometer of levels of economic activity. Obviously, we should not stop using this system as a source of economic information.

The problem lies in how GDP has come to play such a defining role in public debates about economic performance and social progress, and ultimately in policy-making. In an economic narrative dominated by the growth rate of GDP, significant and growing problems at the household level, in societal conditions and well-being, in environmental welfare, and in other key dimensions of our stability and progress as a nation, are held at the margins of debate, many steps removed from public attention let alone serious political action.

The case against GDP can be broken down in seven basic ways:

- 1 DISTRIBUTION:** GDP tells us nothing about how growth is distributed at the household level. For example, while U.S. GDP more than doubled over the last 30 years, median household income grew only 16 percent. Nearly all of the GDP growth went to the top 20 percent and most of those gains went to the top 10 percent of households. Whether GDP goes up or down, it gives us no sense of who is benefiting from the gains or how the average household is faring.
- 2 QUANTITY VS. QUALITY:** GDP measures the quantity of goods and services but not the quality. Money spent on alcohol and gambling is just as “good” by GDP standards as money spent on books and exercise. What is good for GDP is often harmful by other important criteria such as health and social well-being.
- 3 DEFENSIVE EXPENDITURES:** GDP does not distinguish between expenditures that positively increase human welfare, such as college tuition, and “defensive expenditures” that protect against threats to current welfare, such as cleaning up industrial disasters, treating socially-conditioned diseases (smoking-related, obesity, etc.), and military spending to protect national interests from real or perceived threats.
- 4 REAL ECONOMIC VALUE VS. BORROWED AND SPECULATIVE GAINS:** GDP tells us nothing about the sustainability of economic activity. Consumption financed by borrowing adds to GDP just like consumption financed by real gains in household buying power. Financial services add to GDP whether by allocating capital for productive investment or by fueling gigantic asset bubbles with speculation and transfer of risk.
- 5 DEPLETION OF NATURAL CAPITAL AND ECOSYSTEM SERVICES:** GDP essentially ignores environmental problems. Economic activity that depletes natural resources is just as valuable, by GDP standards, as economic activity fueled by renewable resources. Activities that contribute to global warming add value to GDP today even as they threaten massive economic costs in the future due to climate change impacts.
- 6 NON-MARKET ACTIVITIES:** GDP tells us nothing about the value generated by non-market services provided in the household, in the public sector, in civil society, and in the broader ecological systems that surround us. The human and social capital generated by parenting, education, voluntarism, community activities, green spaces and other aspects of public planning, etc., are not measured by GDP even though they substantially affect economic well-being and the overall productivity of society. So too, public output—the value generated by public spending in many areas—is not accounted for; nor is the output or social value of charitable services.
- 7 SOCIAL WELL-BEING:** GDP does not always track with indicators of social well-being, such as rates of poverty, literacy, and life expectancy. For example, the United States ranks near the top for per capita GDP but at the same time has the highest poverty and incarceration rates in the advanced world. Likewise, levels of subjective well-being, including life satisfaction, feelings of security and autonomy, and trusting one’s neighbors, are often higher in poorer countries with strong family and community structures than in wealthy countries characterized by social atomization and mass-consumerism.

In short, GDP ignores many “bads” from economic activity, counts many “bads” as goods, and fails to count many important goods that are not transacted in markets. While these shortcomings can be addressed as technical weaknesses in a particular statistical model, fixing GDP, or going “beyond GDP” with other measures, is not simply a problem of fixing the methods. Rather, the deeper problem is the economic model lying behind GDP and reinforced by our over-reliance on GDP. Depending on GDP promotes an economic model devoted to “growth at all costs,” where “more” is equated with “better” and an expanding economy equals social progress even as average households do not benefit and the critical non-market dimensions of our lives and nation—our human, social, and environmental capital—are depleted for lack of adequate investments and protections. Changing our economic feedback system is a crucial step for refocusing public concern and bringing new policy demands into the mainstream of debate and decision-making about the nation’s future.

GDP AND PUBLIC POLICY

The design, calculation, and reporting of GDP

GDP was originally designed to fill a national measurement gap and aid in the development of economic policy following the Great Depression. Simon Kuznets of the National Bureau of Economic Research led the development of consistent methods for measuring economic activity in the United States based on income.¹¹ In the early 1940s, these accounts were extended to measure production in response to wartime planning needs. The resulting National Income and Product Accounts were further expanded and refined after World War II, creating an integrated system of national, international, regional, and industry accounts.

As noted earlier, GDP, the headline indicator of the national accounts, is designed to track market activity in the economy by measuring the total value of all final production within a given time period. GDP is essentially the market value of all goods and services produced within the United States. A related measure, Gross National Product (GNP), measures the total income of U.S. citizens, regardless of where the income is generated. Since policymakers tend to be interested in levels of economic activity within national borders, GDP is usually preferred to GNP for making policy decisions.

GDP aggregates a wide range of economic data in one single number, a bottom-line dollar measure of total output. It can also be disaggregated to analyze activity in various sectors and to identify trends in the main sectors that contribute to changes in GDP, such as savings, consumption, or government spending. The Bureau of Economic Analysis within the U.S. Department of Commerce reports national and regional GDP estimates to the public on a quarterly basis. Comparisons to estimates from previous quarters or years show how GDP is changing over time and give a sense of the level of economic growth that can be expected. The amount of GDP per person (“per capita GDP”) is reported widely as an overall indicator of the standard of living, which assumes that increased economic production always broadly benefits a nation’s citizens. Government agencies, media, businesses, and others quickly pick up on GDP reports and disseminate the information widely, where “it is used by the White House and Congress to prepare the federal budget, by the Federal Reserve to formulate monetary policy, by Wall Street as an indicator of economic activity, and by the business community to prepare forecasts of economic performance and make decisions on production, investment, and employment planning.”¹²

Specific Policy Impacts of GDP

Reports on GDP influence public policy in direct ways. GDP forecasts are a major input for decisions on monetary policy that involve setting interest rates and trying to control inflation by keeping output close to its long-term trend. Information about GDP rising or falling is also used as a barometer of the business climate, where business and government regard it as a signal to adjust their policies based on how GDP levels match expectations. Private companies and individuals base many of their investment decisions on GDP reports.

Tax revenues are estimated based on GDP trends, with direct consequences for fiscal policy and government expenditures. Tax policy is often justified based on promises about boosts to GDP. GDP information is also used to evaluate creditworthiness for providing international loans and to help determine trade policies with other countries. More broadly, consumer confidence is deeply influenced by reports on expected GDP growth. This in turn drives consumers' purchasing behavior and affects tax changes and other policy actions related to the relative strength or weakness of consumer demand. And most dramatically, GDP is the benchmark for defining a recession—a recession is declared after two consecutive quarters of negative GDP growth. Here, GDP becomes the focal point for aggressive, multiple policy interventions designed to stimulate new growth in direct ways, including monetary, tax, and employment policies.

Indirect Impacts of GDP

The direct impacts of GDP reverberate throughout the economic and policy worlds. But the indirect impacts on public policy are probably more significant than any individual policy action tied to GDP reports. Generally, political leaders are charged with maximizing GDP, and yet they are also obligated to provide public goods such as border security, food safety standards, and environmental protection, which could lower GDP growth by raising prices or otherwise limiting market activity. The result is that policy proposals are often broadly characterized as good or bad for GDP. In ensuing debates about trade-offs, those policies or actions with potential to limit economic growth are likely to be dismissed, regardless of their potential to increase real wealth, improve the quality of life for average citizens, or ensure a more sustainable development path for the country.

If the goal is to make progress toward improved social, economic, and environmental conditions, GDP can only give a limited view of what is happening. For example, depending on who performs an economic service, an activity may or may not count in the current national accounting framework. A volunteer will not contribute any additional boost to GDP, while a paid employee will, even though they may do the exact same work.

This way of accounting creates a strong bias away from sources of well-being that are not transacted in the marketplace. More generally, the pervasive politics of growth often excludes social welfare and sustainability from the scope of concerns that policymakers directly address. Short-term economic gains measured by GDP, and the focus on quantity rather than quality of output, narrow the focus of policymakers and often obscure deeper needs and mounting liabilities. For example, new financial products may cause GDP to rise, but without any real growth in wealth. Indeed, overemphasis on GDP can actually undermine genuine progress by masking huge assets bubbles and other financial dangers, as we saw with the crash of the late 2000s. Conversely, policy development for more sustainable growth is stymied because we lack robust measurement tools to effectively target and evaluate appropriate interventions for such a goal.

Regardless of whether everyone agrees about specific ways to deal with policy challenges, we can at least agree that the economic metrics we use for policy development should be providing us with an accurate picture of the economy. Policy debates and decisions must be informed by reliable indicators and accounting frameworks that capture the most relevant trends for households and communities, which often do not track with the aggregate market trends reflected in GDP. The market output-centered approach embodied in GDP and related measures does not meet this more comprehensive standard, and consequently, over the last four decades, a range of new approaches has emerged to fill important gaps in our economic information and understanding.

NEW MEASURES TO IMPROVE PUBLIC POLICY

What role could reform of the system of national accounts, along with new kinds of social and environmental indicators, play in guiding policies for improved social, environmental, and economic conditions? Here we provide a representative look at the leading alternative approaches in this active area of research and debate, with an eye toward how these new accounting frameworks can be applied in realistic policy situations. While more work is needed to develop effective policy frameworks based on new accounting methods, the general contours of such applications are increasingly well-understood by experts in the field.

To craft public policy that will lead to genuine social progress, we need measures of the variables that contribute to a higher quality of life. The system of accounts currently in place at the national level does not register much of the information available about important aspects of economic life in the United States, and thus fails to provide policymakers with key information about trends in the social fabric of the nation. The alternative frameworks reviewed here are increasingly supported by economic theory and advances in statistical design and data flows. They can be used to account for key dimensions of progress left out of the prevailing GDP picture. Broadly, these dimensions include household economic welfare, production within the household, exchange and value-creation outside of the market economy, environmental assets and services, social well-being, and aggregate sustainable economic welfare.

HOUSEHOLD ECONOMY

GDP growth does not always tell an accurate story about how households are affected by changes in the economy. Most obviously, an economy may be growing according to GDP, but if most of the growth is captured by only a small percentage of the population, as has been the case in the United States over the last several decades, GDP growth cannot be considered an accurate barometer of living standards or a guiding metric for policymakers attuned to the needs of ordinary people. Expanded national accounting that captures critical information about income, consumption, and savings at the household level can put a new lens on the national economy, helping to define and draw attention to the growing distress that many face. The Stiglitz Commission has put a high priority on improved household measures, with detailed recommendations in its main report.¹³

Incorporating distributional perspectives is the most obvious need. For example, GDP per capita is often cited as a measure of a country's standard of living, but depending on how national income is actually distributed across society, a typical person in that society may earn significantly less than the GDP per capita (e.g., median personal income for the working age population in the United States is approximately \$32,000, compared to GDP per capita of approximately \$47,000). So too, household consumption and welfare are affected by differences in the cost of living for different groups in society. More targeted, distributionally sensitive inflation measures are needed to assess changes in the cost-of-living at different levels of income and in different parts of the country.

The Bureau of Economic Analysis has begun to focus on these concerns by reconfiguring existing accounts, with certain new data, to create a new suite of household measures called "Everyday Economics."¹⁴ Among the most important of these is a measure of disposable household income, net of taxes and government transfers, and thus providing a transparent picture of household market income—what the market is providing for average families. A related measure is discretionary household income by region—household income net of taxes and of spending for essentials measured regionally. By incorporating often substantial cost of living differences, this new measure is a critical indicator of both household welfare and consumer buying power in the wider economy. A third important account will decompose household savings and wealth estimates into assets and liabilities, illustrating the percentage of household consumption finance by debt. All of these draw on the existing national accounts; what is important is how they are reported, interpreted, and ultimately applied in policy-making. The work has been approved for the BEA, although implementation has been delayed because of the federal budget stalemate in 2011.

NON-MARKET ECONOMY

One of the most striking limits of GDP is its failure to measure a broad range of activities that are not transacted in markets but are, nevertheless, value-creating and often highly beneficial economically. This is the flip-side of the problem of quality vs. quantity with GDP: if not everything with a price has a positive value (e.g., disaster cleanup), not everything with positive value has a price. For example, parental child care in the home provides the same services as a child-care center in one's neighborhood, but only the latter counts towards GDP. Likewise, the natural carbon-sink services provided by forests and grasslands do not count in GDP; at the same time, expensive sequestration technologies may add billions to GDP, but only to maintain current levels of welfare that are threatened, in part, by the loss of natural sinks.

Inequality vs. Growth

In assessing whether economic growth is generating real social progress, one of the most important variables is the level of inequality in a society. Simply put, growth's contribution to human welfare depends on how national income gains are distributed and how this distribution translates into marginal welfare improvements in society. For example, a highly unequal distribution that enables the average rich family to purchase a third or fourth home would contribute far less to our national welfare than a much more equal distribution that increases working-class homeownership. A dollar added at the top adds little or no welfare compared to a dollar added at the bottom.

In a recent analysis of inequality in the Maryland economy, using the Genuine Progress Indicator (see pg. 25 for more background in the "GPI" method), the lost potential welfare gains (or "genuine progress") due to growing inequality represent a significant drag on progress: if the level of inequality remained unchanged since 2000, Maryland's GPI would have risen by 4.15 percent in 2009, compared to the actual GPI increase of merely 0.25 percent, and only 1.23 percent growth in Gross State Product.¹⁵

The need for new accounting to capture undoubtedly very large magnitudes of “non-market value” in our society has long been understood in mainstream economics, giving rise to a substantial technical literature as well as high-level programmatic development in the National Research Council and other leading scientific bodies. At the heart of this effort, economists have been concerned that important sources of economic well-being and rising living standards remain in a “black box”—un-quantified and un-valued, and thereby inaccessible for policy development. This concern is sharpened by the well-grounded view that non-market activities are a major source of human, social, and intellectual capital in our economy—arguably our most important national assets for future productivity, innovation, and sustainable economic growth.

In this light, non-market accounting is increasingly viewed, not just as a technical improvement on conventional GDP measurement, but as a vitally important tool for policymakers focused on promoting broad prosperity in the years ahead.

The Design and Scope of Non-Market Accounts

Non-market accounts have been designed to capture the value of non-market goods and services and provide critical feedback on how they contribute to higher quality of life and future welfare. In the seminal *Beyond the Market* report published in 2005, five priority areas were identified by a National Research Council panel organized to study the design of non-market accounts: household production, education/human capital, health, public outputs from governments and non-profit organizations, and environmental wealth and welfare (the value of environmental assets and benefits). [The latter, really a field unto itself, will be examined separately below].¹⁶ Improved measurement of these productive activities outside of the market can be used to better identify sources of economic prosperity and gauge the potential for policy interventions to promote those sources for wider benefit.

Non-market accounting involves determining a quantity for non-market goods and services along with a value or price. The dominant input for non-market accounts is the amount of time that one devotes to a productive activity, for example, the time that an individual spends cleaning their house. The American Time Use Survey, launched in 2003 by the Bureau of Labor Statistics, provides essential information on the time input for non-market activities, especially those occurring in the household. The National Research Council panel on non-market accounts recommended that the time use survey be maintained and improved to continue providing rich data for non-market accounting. Given the absence of prices for non-market goods and services, valuation might involve determining suitable market analogues. An hour that someone spends cleaning their own home can be valued by assessing the cost to hire a house-cleaner to perform that activity (replacement cost) or the missed chance to earn income rather than devote their time to cleaning the house (opportunity cost). The task of assigning values in the development of non-market accounts still evokes some controversy, but this is an active area of research with methods that are increasingly being accepted as appropriate for use in a national system of accounts. In what follows, we review some of the important methodological issues and policy implications in each of the key areas.

Household Production

Household production refers to the value of goods and services produced in a home for consumption by those within the home. This includes household activities that are not bought or sold in the marketplace, such as preparing homemade meals, house cleaning, or repairing one’s own home. The BEA has laid groundwork for developing a satellite household production account that recognizes

households as part of economic production, and capital goods purchased by households (for example, kitchen appliances) as investments for production.¹⁷ The measurement of time devoted to household production provides the basis for tracking this element of the non-market economy; the BEA's prototype household production account relies upon new time use data from the American Time Use Survey.¹⁸ Other data include non-labor inputs for various household activities (for example, the use of a stove in cooking meals)—data mostly already available from various statistical agencies. National accounts that include information about household production would improve our understanding of the sources of economic growth and consumer demand for goods and services. This information is important for making decisions about monetary policy intended to influence inflation and employment. Household production accounts would track the tradeoffs between market and non-market production throughout the business cycle, enabling policymakers to respond appropriately. For example, policies could be put in place to balance labor force participation during shifts toward or away from non-market production, in order to stabilize demand and business investment.

Policies that impact the distribution of income would benefit from the more comprehensive view of economic activity provided by household accounts, especially in view of changing family structures and regional employment differences. A recent study showed that household production added twenty-six percent to GDP in 2004;¹⁹ estimates including parental care and education in the home have been significantly higher. Such measures can contribute to expanded welfare analysis and social policy development. For example, potentially large individual and social benefits of household production could be considered in the development of a range of public policies designed to sustain household welfare in an era of high, and increasingly long-term, unemployment.²⁰

Family, School, and Human Capital

Expanding home production accounts to include parenting, elder care, and forms of mutual assistance across extended family structures can help to define and assess a distinctive “care economy” in our society and how changes affecting this activity can impact social and economic welfare. Broadly, this is a question of human capital, defined as the knowledge, skills, and capacities of individuals that can be put to productive use. It is the basis for an innovative workforce and a productive economy. Human capital is considered to be a large component of an economy's overall capital stock, though much of it is intangible and difficult to measure. Recent work in this area indicates that most of our human capital in the United States, as much as seventy percent, is non-market and thus missed by conventional economic indicators.²¹

Care for children in the home involves a substantial non-market investment in the human capital of household members. The out-of-pocket expenditures required for childcare at home are captured in national accounting, but the time that parents and other family members devote to childcare is not. And yet, helping our children develop their human capital plays a significant role in maintaining a productive economy.

The non-market time inputs for family care contribute to the emotional, social, and ethical development of children. Accounting for these inputs could clarify and specify how non-market investments in young children are a precondition for elementary, secondary, and advanced learning in schools and other settings. For example, while spending on the Head Start Program is counted as part of national income, family-based efforts to prepare children for school should also be counted. Human capital accounts that register the non-market aspects of childcare could guide policy decisions about allocating public spending to family programs.

Human capital can also be tracked by education accounts that capture the investment of time and money spent on formal education, as well as the resulting increase in stocks of knowledge and skills. Regarding education as an investment in human capital makes sense because the non-market benefits are realized over an extended period of time. While GDP does include some education expenditures, it does not account for education's contribution to economic productivity, personal income gains, and broader societal welfare. Such benefits may be somewhat difficult to measure, but they are evident in the ways that individuals with higher education levels tend to have higher earned incomes, productivity, levels of community involvement, and levels of reported happiness. Here too, time use is an important non-market input to education, both in terms of the time students spend in school and the time parents spend engaged in school-related activities.

Measurements of the value of education reveal it to be an important source of national income growth. One major study estimates that 15 percent of per capita GDP gains from 1915 to 2005 were due to "educational advance within the workforce."²² How public programs can contribute to such large-order economic gains is modeled in a Brookings Institution experimental study of the economic returns from federal investment in a universal preschool program.²³ The study found that, by 2080, such a program will add 3.5 percent to GDP, or about \$2 trillion in income (in 2005 dollars). Along with these large private gains, the program will also generate a nearly six-fold net fiscal surplus; that is, the tax revenues generated by the income gains attributable to the program (\$354 billion) will be nearly six times higher than the actual costs of the program (\$59 billion). [Likely substantial, and measurable, social benefits, such as reduced costs related to crime, should also be noted.]

Almost certainly, non-market accounting of education could begin to inform policymakers about what kinds of education investments lead to the greatest private and social benefits. For education programs, such tools will be essential, not only in building public consensus for new investments, but in helping policymakers target these investments in the most productive ways.

Health Care

In the case of health, current accounting methods focus heavily on inputs that are visible within the market: health expenditures. Such an approach does not provide equally relevant information about outputs, for example, about health improvements. Health care measures based only on expenditures can tell us where health care money goes and where it comes from, but they explain little about what health care money buys.²⁴

Non-market health accounts would measure the flow of better health from health expenditures, and how a healthier population is more economically productive. Some of the valuable non-market inputs to health include the time devoted to health-improving activities, such as diets and exercise. Data on the health status of the US population could be obtained from the National Health and Nutrition Examination Survey and the National Health Interview Survey, but more work is needed to develop data about the quality of health care inputs and outputs.²⁵

Inputs to the health care system may or may not result in actual improvements in the health of citizens. Improved non-market accounts in the area of health would enable policies aimed directly at increasing the production of health rather than health spending. Health accounts can help answer critical policy questions: Where should public spending on health care be directed in order to gener-

ate the most health value per dollar? What are the returns to particular treatments of disease, and what are the sources of change in health care costs? Specifically, shorter hospital stays mean that families may incur non-market costs associated with caring for discharged patients at home: a non-market health accounting framework could help lawmakers develop policies to deal with this issue, so that measures which apparently save money are not just shifting costs to individuals outside the market. In general, better understanding of the relationship between spending on health care and health improvements would be valuable in making decisions about how to spend health resources, increase health care productivity, and improve the nation's health overall. Ultimately, moving toward a more robust understanding of health care outcomes lays the groundwork for valuations that bring into focus the economic returns on improvements in health and these improvements, in turn, as a type of wealth, or "health capital," accumulating in our society. In contrast, the current focus on health care spending as a share of GDP provides little guidance for understanding the broader economic contributions of effective health care.

Public Outputs from Government and Nonprofits

Government provides significant public goods and services, such as national defense and basic scientific research. These outputs are given away without being bought or sold and thus they are not counted for GDP. Current national accounting methods measure these outputs simply in terms of the inputs bought for their production; that is, the government share of GDP is measured only by what government spends, not by what government produces or helps produce. Yet, the vital economic importance of government-funded research and development has been documented in numerous case studies, for example in the computer industry and other high-tech sectors. It is estimated that eighteen of the twenty five most important breakthroughs in computer technology between 1950 and 1962 were funded by the government, and in many cases the first buyer of the new technology was also the government.²⁶ The GDP framework, however, does not capture the undoubtedly large economic effects of such government activity.

A Case Study in Public Investment and Market Output: The Human Genome Project

In 1990, the U.S. government launched the Human Genome Project, a scientific research program coordinated by the Department of Energy and the National Institutes of Health with the aim of decoding the entire human genome. According to a major study by the Battelle Memorial Institute, the Human Genome Project's total public investment of \$3.8 billion over more than a decade has generated over \$796 billion in economic gains, not least by providing the chief intellectual capital for the emerging industry of genomics.²⁷ In 2010 alone, this investment returned \$20 billion in personal income for American families, 310,000 public and private sector jobs, and GDP growth of \$67 billion. In fact, the tax revenues generated by the genomics industry in 2010 surpassed the value of the entire 13-year investment in the project.²⁸ Overall, the project has returned \$140 for every \$1 invested by the public.

Along with such market returns, perhaps even more important are the potential social returns, as advances in genetic knowledge contribute to broader gains in human welfare. Improvements in medical understanding for the prevention, diagnosis, and treatment of many diseases is one major area of social returns, already evident; yet the scope of potential impacts goes far beyond medicine. Other impacted fields, according to the Battelle study, include renewable energy, industrial biotechnology, agricultural biosciences, veterinary sciences, environmental science, forensic science and homeland security, and advanced studies in zoology, ecology, anthropology and other disciplines.²⁹

Likewise, nonprofits conduct charitable research and coordinate the productive activities of millions of volunteers. Groups such as Independent Sector and the Urban Institute track the increasingly large role that nonprofits play in the economy, but accounting for the value generated by nonprofit activities requires detailed data on elements missed by current national accounting, such as volunteer labor and the value of collective goods such as homeless services, summer youth programs, and civic engagement initiatives. Some of this information is available from the Current Population Survey and organizations that track charitable statistics, but the National Research Council report on non-market accounts notes that complete “valuation of goods and services produced by government and by the economy’s nonprofit institutions remains a long way off.”³⁰

Non-market accounts for the public sector could provide important feedback for assessing the output of government programs and the private and social returns from public investments. Policies aimed at providing public services would benefit from a more comprehensive measure of the value of government output. Budget policies, for example, could be more accurately targeted in support of cost-effective investments. The expanding role of non-profits in the public sector could also be assessed more clearly.

ENVIRONMENTAL ACCOUNTS

The increasingly important role of environmental variables in national policy demands comprehensive and up-to-date systems for environmental accounting. Since many of the benefits people derive from ecosystems—for example, freshwater provision—do not have market prices, they are often neglected or undervalued in decision-making. Environmental accounts provide the basis for incorporating environmental costs and benefits into policy assessment and decisions on regulation and spending. The methodologies of environmental accounting seek to rectify fundamental flaws in conventional economic approaches to natural resources.³¹ These flaws include:

- failure to account for scarcities and depletion of natural resources, and associated impacts on economic productivity;
- exclusion of environmental degradation and adverse environmental change due to economic activities, most importantly the large-order impacts of global warming and other aspects of anthropogenic climate change (such impacts are treated as market externalities and therefore are excluded from national income accounting);
- measurement of environmental protection expenditures as positive contributions to the economy, when in fact they are maintenance costs providing no additional welfare.

The following discussion covers several current approaches to integrating these sorts of environmental concerns into national accounting. They range from formal accounting frameworks, such as Integrated Environmental and Economic Accounting, to non-monetary, physical indicators that measure quantities of natural capital and its consumption. While some of the tools stop short of valuation, they provide important information for guiding policy in areas such as sustainable development, land use, resource management, and environmental protection.

The risks of environmental change and decline are major topics in national policy today. Strategies for dealing with climate change require a system to account for greenhouse gas stocks and flows. Policymakers focusing in this area would benefit from an improved understanding of how and where carbon is stored in forests and other natural carbon sinks, how environmental policies affect emissions

levels, and whether natural or artificial approaches to carbon sequestration (or what sorts of combinations) make the most economic sense in efforts to mitigate the problem. In Sweden, environmental accounting methods were used to uncover how policies that reduce carbon emissions may generate additional, unintentional benefits in the form of reduced domestic sulfur and nitrogen emissions, and thus may be more cost-effective than purchasing emissions permits.³² National governments with systems of environmental accounts can better manage how their economies impact and depend upon ecological resources, and how appropriate investments can protect and expand natural wealth and increase the flow of environmental benefits in society.

Integrated Environmental and Economic Accounting

In 1999, a National Research Council report, *Nature's Numbers*, reviewed environmental accounting efforts in the United States and recommended that the United States Department of Commerce continue to develop Integrated Environmental and Economic Accounting (IEEA), a framework initially published by the United Nations Statistics Division in 1993.³³ [Congress had previously denied funding to such an effort when it was first proposed in 1994.] The IEEA framework expands national economic accounts by creating a satellite environment account with supplementary information about environmental assets and asset changes, resource stocks, nature's sink capacities (such as pollution absorption capacities), and costs for depletion and degradation (resource depletion refers to the overuse of environmental assets so that the overall stock of natural capital available declines; environmental degradation is roughly the decline of the value or quality of a resource). As with other non-market accounts, IEEA involves complex tasks for measuring environmental quantities and assigning monetary values to them. IEEA is based on widely-accepted methods using market and behavioral data, though such data are not always available. Since the publication of *Nature's Numbers* over a decade ago, there is more consensus on appropriate, reliable methods for environmental valuation, bolstered by widespread international efforts for better monitoring of environmental conditions.

IEEA is directly compatible with current national accounting and could have several valuable roles in U.S. policy-making. By bringing together information about the economy and the environment in a common accounting framework, IEEA could shed light on how economic production and consumption activities impact the environment, and how the environment contributes to the economy. Data derived from comprehensive environmental accounts could be used to better analyze the effects of environmental protection or degradation on economic productivity.

Integrated environmental and economic accounting informs an air pollution decision in the Philippines.

Monetary accounts of environmental goods and services were used in the Philippines to evaluate the use of economic instruments for addressing air pollution. As Glenn-Marie Lange explains, "One cost-benefit analysis considered two alternative policies to reduce atmospheric lead: a tax on leaded gasoline vs. a complete phase-out of leaded gasoline over a three-year period. The accounts provided the physical lead emissions, while data about the value of benefits (improved human health due to lower emissions) and costs (measures to reduce emissions) were obtained from other studies and used to construct monetary accounts. The results found that the present value of the phase-out was close to three times that of the tax differential approach, primarily because of its much greater and faster impact on health."³⁴ This application of an approach to integrated environmental and economic accounting informed policymakers that a phase-out was a more effective policy than using economic incentives to reduce lead emissions.

Information drawn from environmental accounts could enhance the management of natural assets under federal purview. Federal agencies responsible for the management of natural resources could create better balance among competing uses such as harvest, wildlife preservation, recreation, or the provision of ecosystem services. IEEA could improve policymakers' understanding of who benefits from the income provided by natural resource exploitation, and how efficiently those resources are managed.

IEEA could also lead to improved regulatory decision-making by providing a clearer view of the costs and benefits of environmental regulations, allowing for more sound cost-benefit analysis of a given rule or regime. Undoubtedly, credible accounting of the economic value of environmental protection and restoration will play an important role in continuing progress on many environmental issues. Information from environmental accounts could inform policies about carbon taxes and credits, and help determine the most effective market incentives for new energy sources. It could also be used for policy development on extended producer responsibility, creating a common valuation framework for assessing the social and private costs and benefits of green production and consumption standards.

Ecosystem Service Valuation

In the most widely accepted definition, ecosystem services are the benefits people obtain from ecosystems. The Millennium Ecosystem Assessment, a multi-year, international effort of hundreds of scientists, described declining ecosystem services in four main categories: provisioning services (the production of food, fiber, wood, fresh water), regulating services (air quality maintenance, erosion control, climate regulation), cultural services (non-material benefits such as recreation, spiritual enrichment, and aesthetic values), and support services necessary for the production of all other ecosystem services (primary production by plants; soil formation).³⁵ In order to operationalize the ecosystem service concept in national accounting, economists and ecologists have been working together to define units of measurement and appropriate prices. Valuing ecosystem services is difficult because nature does not come in tidy units like cars or loaves of bread, and the benefits to humans arise from public goods for which there are often no market comparisons for prices. Some controversy remains around the details of ecosystem service valuation, although there is widespread consensus that such an approach provides a powerful market basis for managing natural capital. In the United States, the National Science Foundation, the Environmental Protection Agency, and the Department of Agriculture have all increasingly shown support for valuation of ecosystem services.

Investment in ecosystem services maintains clean drinking water in New York City.

New York City residents depend on protected areas in the Catskills Mountains for drinking water. By investing in watershed protection with approximately \$1-1.5 billion, policymakers were able to maintain water purification services for the city. This investment in ecosystem services was far less than the estimated \$6-8 billion plus \$300-500 million per year operating costs required for a water filtration plant. Instead of doubling, taxpayers' water bills went up only 9 percent.³⁶ The protected watershed areas also provide additional co-benefits in the form of recreation, wildlife viewing, and education.

Accounting for the full economic benefits of nature could lead to policies that support an optimal mix of competing uses—how much fishing, recreation, or logging to allow in national forests, for

example. Integration of ecosystem services into national accounts could reveal relatively low-cost ways to meet policy objectives in the areas of climate, biodiversity, and food security. One popular approach is to design a Payment for Ecosystem Services scheme in which landowners can be compensated for land management that maintains or enhances specific ecosystem services. The Chinese government has used this approach to prioritize conservation efforts in “ecological function zones” that provide real economic benefits.³⁷

Several new tools have been developed to model and map the delivery, distribution, and economic value of ecosystem services. InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs) has been designed to assess the potential impacts of policy decisions and the tradeoffs between environmental, economic, and social benefits.³⁸ ARIES (Artificial Intelligence for Ecosystem Services) can identify where ecosystem services are generated in the landscape, the economic value of benefits provided, and the distribution of benefits across the landscape.³⁹ Users of these models can explore cost-benefit scenarios that support sustainable land-use, power, agriculture, etc.—in many cases potentially striking a balance between maintaining ecosystem values while generating new economic benefits.

International discussions on conservation have prompted national government commitments to account for ecosystem services. The Economics of Ecosystems and Biodiversity (TEEB), a project of the United Nations Environment Programme and several partners, recently released a synthesis report that helped motivate countries such as India to commit to developing a framework for green national accounts to be published alongside their traditional financial accounts. In a related development, the World Bank launched a 10-country partnership in the fall of 2010, explicitly aimed at integrating the economic benefits of nature into national accounting systems.⁴⁰

Non-Monetary Environmental Measures and Indicators

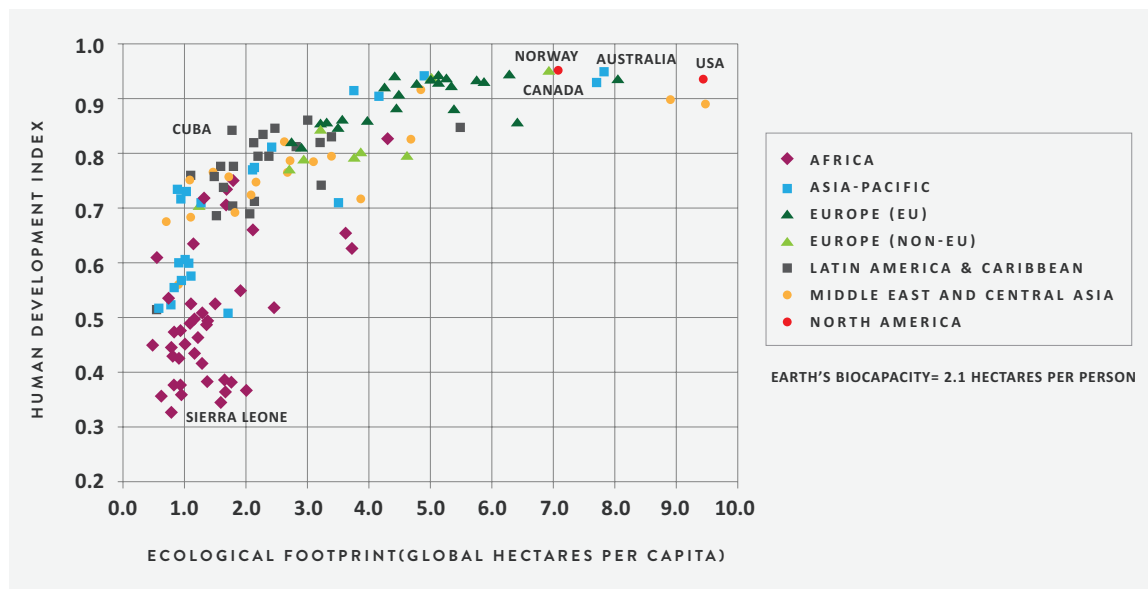
The Ecological Footprint is a resource accounting tool that measures the demand that humanity places on nature. It is used to calculate “how much land and water area a human population requires to produce the resources it consumes and to absorb its wastes, using prevailing technology.”⁴¹ It avoids the controversy surrounding economic valuation by instead monitoring environmental resource use in the context of resource availability. Although the Ecological Footprint is not expressed in monetary terms, it does reduce complex information about environmental factors to a single unit: the amount of habitable land needed to support human economies. The United States’ footprint is found to be more than twice the available bio-capacity, and a large portion of the overshoot is due to greenhouse gas emissions. Other countries with similar living standards have substantially smaller ecological footprints (See Fig. 1).

Several governments, including Switzerland, Wales, and the United Arab Emirates, have applied the measure as a management and communication tool. A program of the European Union called One Planet Economy Network has developed a footprint tool that can be used to assess budget and investment decisions and evaluate policy scenarios by country or for the entire EU. The Ecological Footprint can also be applied to local regions, businesses, and specific products to better understand how consumption and production activities impact available resources.

The Environmental Performance Index is published by Yale and Columbia universities and uses quantitative benchmarking to rate national environmental policies. The index provides information on how a country ranks in ten policy categories across ecosystem vitality and environmental

health. Rankings are determined according to established policy targets and can be used to measure progress toward environmental goals. A primary aim of the project is to inform more data-driven policy-making by allowing analysts to evaluate environmental performance by specific issue, policy category, peer group, and country.⁴² This can be valuable for making decisions about which environmental policy areas should be a priority for government action.

FIGURE 1. HUMAN WELFARE AND ECOLOGICAL FOOTPRINTS COMPARED



Data sourced from: Global Footprint Network 2008 report (2005 data) UN Human Development Index 2007/08

THIS GRAPH PLOTTING ECOLOGICAL FOOTPRINT AGAINST HUMAN DEVELOPMENT PERFORMANCE ON A COUNTRY BASIS SHOWS THAT MANY COUNTRIES IN EUROPE AND SEVERAL IN OTHER REGIONS COMBINE HIGH HUMAN DEVELOPMENT WITH SIGNIFICANTLY LOWER ECOLOGICAL FOOTPRINTS THAN THAT OF THE UNITED STATES.

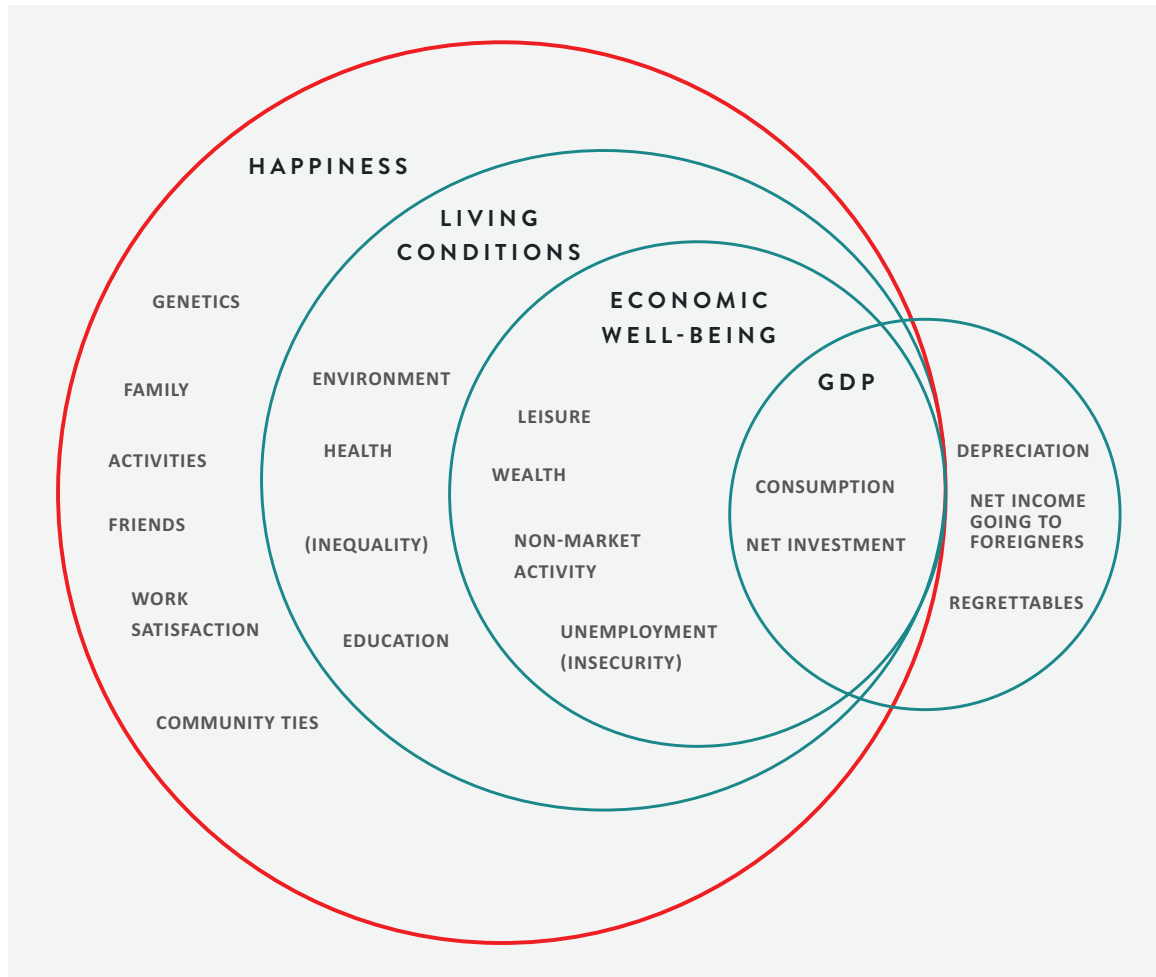
SOCIAL WELL-BEING

The economic definition of well-being as utility is useful when focusing on the material resources an individual has at their disposal. But while income and other material resources clearly contribute to well-being, measures of these resources cannot capture all that contributes to well-being. Many other aspects of experience, including economic security and status, family and community ties, and broader living conditions in one’s surroundings, contribute to well-being along with material resources (See Fig. 2).

National accounts specifically devoted to well-being could provide valuable information to policymakers about the quality of people’s lives and how people’s well-being might be affected by various policies. Well-being accounts could assist policymakers deciding among competing uses of limited resources by revealing how people’s overall well-being might change as a result of investments in different areas such as health, transportation, or education. In a trade-off decision about investing in, for example, economic development or environmental protection, policymakers could identify what types of trade-offs harm the fewest people and which groups stand to lose out or gain from a given policy.

Indicators of well-being based on objective data, such as the Human Development Index, are currently used by some national governments.⁴³ Other measures focus on subjective well-being—the positive and negative emotions that people experience, or the level of self-reported satisfaction that people have about features of their lives. Accounts of subjective well-being, especially those connected to time-use surveys, can supplement objective measures, helping in the focus and design of policies with a strong positive impact in people’s lives.

FIGURE 2. THE MANY ELEMENTS OF HAPPINESS AND WELL BEING



Source: Stefan Bergheim, Measures of Well-Being (Frankfurt, Germany: Deutsche Bank Research, 2006)



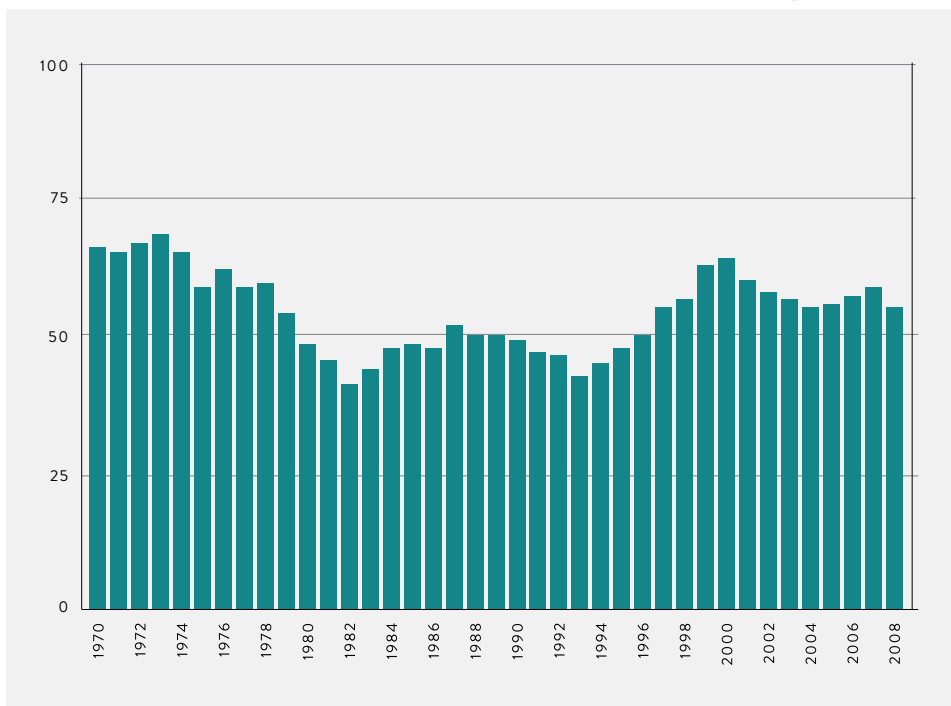
SIGNIFICANT DETERMINANTS OF WELL-BEING EXIST BEYOND THE NARROW SCOPE OF WHAT GDP MEASURES.

Objective Indicators of Social Well-being

Since the 1990s, the United Nations has published a Human Development Index (HDI) designed to measure and compare the well-being of nations. With an emphasis on promoting individuals' capabilities, the index uses objective data in three areas relevant to human development: access to a decent standard of living (national income per capita), good health (life expectancy at birth), and education and knowledge (years of schooling and school enrollment). The HDI and associated Human Development Reports have been used as a government framework for resource allocation, mostly in developing nations.⁴⁴ International policies that deal with trade, foreign aid and development assistance, and immigration and cross-boundary mobility could benefit from the information provided by the HDI, especially in situations where objective well-being data needs to be compared among several countries.

An initiative in Canada offers an example of a national government tracking objective measures of well-being. The department of Human Resources and Skills Development uses data collected by Statistics Canada to report on indicators of well-being in the domains of work, learning, financial security, family life, housing, social participation, leisure, health, security, and environment. The Indicators of Well-Being in Canada website presents data organized into three different kinds of indicators: status indicators that show conditions of progress; life events indicators that refer to major events that impact well-being; and key influences indicators that reflect individual and societal resources. The ability to see how the well-being of Canadians changes over time enables broad evaluation of whether public policies are creating a better society.⁴⁵ The database can be used to construct national trends, disaggregate information by province, and compare some indicators with OECD countries in order to provide policy guidance on different levels. Another approach is illustrated by the long-running Index of Social Health of the United States (See Fig. 3), a composite indicator combining data on in-

FIGURE 3. INDEX OF SOCIAL HEALTH IN THE UNITED STATES, 1970–2008



Source: Institute for Innovation in Social Policy

US SOCIAL HEALTH DECLINED SHARPLY IN THE LATE 1970S. THE MID-TO-LATE 1990S SAW SIGNIFICANT GAINS, BUT US SOCIAL HEALTH REMAINED SIGNIFICANTLY LOWER IN 2008 THAN IT HAD BEEN IN THE EARLY 1970S;

fant mortality, child abuse, child poverty, teenage suicide, teenage drug abuse, high school dropouts, unemployment, weekly wages, health insurance coverage, poverty among the elderly, food insecurity, affordable housing, and several other categories of social concern.

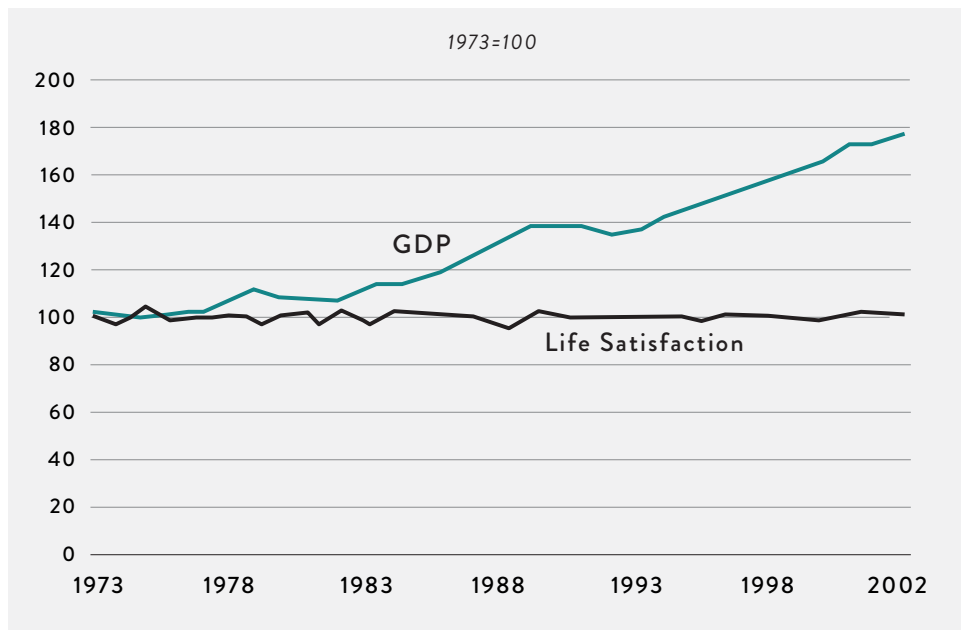
Accounts based on objective indicators of well-being can be powerful measures of progress in terms of international development. So long as data are available, they can offer insight into how countries compare with one another and how certain policies might impact well-being. However, objective indicators still miss important parts of societal well-being; thus, accounting for well-being has evolved to include subjective measures as well, capturing how people evaluate their own quality of life.

Subjective Indicators of Well-Being

Both objective and subjective data are needed to accurately measure the many factors that contribute to quality of life, such as health, education, social and natural environments, and personal and economic security. The Stiglitz Commission, among other bodies, has recommended that statistical agencies supplement measures of objective well-being with subjective data.⁴⁶ One of the most noticeable trends in survey research on subjective well-being in advanced countries is that levels of happiness have not increased with economic growth or rising per capita income (See Fig. 4).

Measures of subjective well-being generally fall into two basic categories: life satisfaction evaluation, often based on “ladder of life” scales, and positive and negative emotions associated with activities of daily life. Levels of life satisfaction better represent broad, consistent aspects of people’s lives, while emotions fluctuate as immediate circumstances change. A large volume of research continues to investigate the types of questions most useful for collecting relevant data on subjective well-being.⁴⁷ As public interest in creating improved measures of overall well-being grows, the benefits of focusing

FIGURE 4. UK LIFE SATISFACTION AND GDP, 1973–2002



Source: NEF (2004)

ACCORDING TO THE NEW ECONOMICS FOUNDATION, THE CLEAR PATTERN IN THE UNITED KINGDOM SINCE THE EARLY 1970S IS ESSENTIALLY NO CHANGE IN LIFE SATISFACTION DESPITE NEARLY CONTINUOUS ECONOMIC GROWTH

public policy on quality of life are increasingly clear. For example, measures of subjective well-being can be utilized to estimate the value of public goods in people's lives, helping to refine national priorities for public provision.

Ed Diener, a leading psychologist in the field of happiness studies, has worked to develop policy analysis based on well-being measures.⁴⁸ In economic analysis, well-being measures can be utilized to gauge the human costs of externalities. For example, in a case where government decisions unevenly affect citizens, such as choosing locations to build airports, the effects on well-being can be used to help determine fair compensation or mitigation strategies. A study of life satisfaction reported by Amsterdam residents who experienced varying levels of aircraft noise was able to provide policymakers with information about amounts of reasonable compensation for individuals whose well-being was affected, as well as estimated costs for noise insulation as a form of compensation. In other situations that result in welfare losses, such as the Gulf of Mexico oil spill in 2010, well-being accounts could help to determine damages, identify those most affected, and set appropriate levels of fines. In the legal profession, the question of how subjective well-being measures can help set damages in tort cases is another area of active research.⁴⁹ Other challenging policy problems, for example tradeoffs between economic development and social problems, can be illuminated by subjective well-being measures. For example, subjective measures can help policymakers more comprehensively assess whether the economic benefits of commercial gambling outweigh the social costs.

Recent studies examining the effects of unemployment on subjective well-being show profound and lasting negative impacts on social trust and community involvement, suggesting the need for a more comprehensive "social cost" analysis of unemployment, as well as relief approaches that deal not only with economic needs but with psychological needs.⁵⁰ Tax policy is also an important arena for subjective measures. Generally, well-being research supports a policy of progressive taxation.⁵¹ Further work in this area could help determine tax structures that contribute to higher overall life-satisfaction across society even as different income groups are taxed at difference rates.

National Accounts of Time Use and Well-being

National time accounting differs slightly from other measures of well-being in that it combines objective and subjective elements—it tracks objective data about the amount of time an individual spends doing different activities combined with assessments of their own emotional experiences during those activities. Proponents of "evaluated time use" envision a system of national time accounts that can be used for "measuring, comparing, and analyzing the way people spend their time across countries, over historical time, or between groups of people within a country at a given time."⁵² A central summary statistic, the U-index, measures the percentage of time that an individual spends in an unpleasant emotional state. While this approach to tracking well-being holds promise, conceptual details would need to be resolved and it would require significant new investments in data collection.

Nonetheless, a national time accounting framework could reflect important dimensions of well-being entirely missed by conventional economic statistics, and thus could discourage misuse of economic measures as well-being indicators. One of the main policy uses would be as a tool for evaluating progress, so that policymakers and the public could gauge whether individuals or certain groups feel they are spending more time in pleasant activities today than they did at some time in the past. Information about the relative frequency of misery experienced in certain settings and by various groups could help guide policies, for example, on restricting overtime in the workplace or on commuting, which consistently rank as highly unpleasant activities.

AGGREGATE SUSTAINABLE ECONOMIC WELFARE

The two measures of sustainable economic welfare described here contain elements of all the other accounting frameworks. Their purpose as macro composites is broader, providing a picture of national-level welfare and a powerful window on the nation's future. These measures can be decomposed in various dimensions (environmental, non-market, etc.) to allow for assessment of specific sources of change and need. But the core principle and strength of this approach lies in the idea that national income and savings, as conventionally measured, must be netted for welfare gains and losses in order to provide a realistic and responsible understanding of the state of the nation and the direction it is heading.

Genuine Progress Indicator/Index of Sustainable Economic Welfare

The Index of Sustainable Economic Welfare was first proposed by Herman Daly and John Cobb in their 1989 book *For the Common Good*. The index built upon earlier work by William Nordhaus and James Tobin, who advanced the principle that GDP should be adjusted for various aspect of welfare that impact people's lives or threaten significant social costs in the future. Independent and academic researchers have developed the accounting framework further and recently re-branded it as the Genuine Progress Indicator (GPI) in order to identify it as a better indicator of national progress than

FIGURE 5. TWENTY-SIX INDICATORS ARE USED TO CALCULATE THE MARYLAND GENUINE PROGRESS INDICATOR

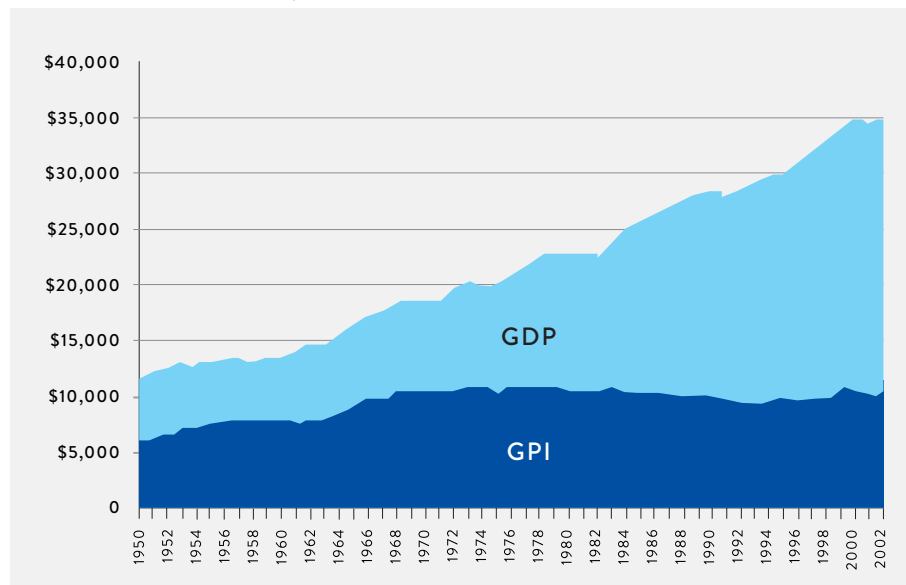
ECONOMIC INDICATORS	ENVIRONMENTAL INDICATORS	SOCIAL INDICATORS
PERSONAL CONSUMPTION EXPENDITURES	COST OF WATER POLLUTION	VALUE OF HOUSEWORK
INCOME INEQUALITY	COST OF AIR POLLUTION	COST OF FAMILY CHANGES
ADJUSTED PERSONAL CONSUMPTION	COST OF NOISE POLLUTION	COST OF CRIME
SERVICES OF CONSUMER DURABLES	COST OF NET WETLANDS CHANGE	COST OF PERSONAL POLLUTION ABATEMENT
COST OF CONSUMER DURABLES	COST OF NET FARMLAND CHANGE	VALUE OF VOLUNTEER WORK
COST OF UNDEREMPLOYMENT	COST OF NET FOREST COVER CHANGE	COST OF LOST LEISURE TIME
	COST OF CLIMATE CHANGE	VALUE OF HIGHER EDUCATION
	COST OF OZONE DEPLETION	SERVICES OF HIGHWAYS AND STREETS
	COST OF NON-RENEWABLE ENERGY RESOURCE DEPLETION	COST OF COMMUTING
		COST OF MOTOR VEHICLE CRASHES

Source: maryland.gov/mdgpi/indicators.asp

GDP. GPI and related frameworks had been used to recalculate economic growth for many countries, including the United States, Australia, Canada, and Germany.⁵³

GPI is a monetary-based index that adjusts GDP for various positive and negative contributions to welfare. The adjustments add positive values such as household and volunteer labor, education, and the services of highways and streets, and subtract negative costs such as inequality in the distribution of income, crime, family breakdown and divorce, unemployment, loss of leisure time, environmental degradation, and the depreciation of natural capital. The 25 or 30 different adjustments (See Fig. 5) involve compiling and computing extensive time-series data sets based mostly on available information. The GPI is an attempt to directly improve conventional GDP in order to account for social, environmental, and economic costs and benefits. The results of GPI studies (See Fig. 6) typically show a growing divergence between GPI and GDP, suggesting that continual GDP growth does not necessarily increase well-being. In contrast to rising GDP per capita, GPI per capita in the United States has leveled off since the 1970s, meaning that further GDP growth may be generating as many costs as benefits.

FIGURE 6. GROSS DOMESTIC PRODUCT VERSUS GENUINE PROGRESS INDICATOR 1950-2002, PER CAPITA (IN 2000 DOLLARS)



Source: Rethinking Progress, 2004

OVER SIX DECADES, US GPI REMAINS RELATIVELY FLAT WHILE GDP STEADILY RISES, SUGGESTING THAT GROWTH IS BEING OFFSET BY SIGNIFICANT WELFARE COSTS THAT ARE NOT CAPTURED BY GDP.

The broadest policy application of GPI is to gauge whether economic growth, and policies focused on promoting growth, translate effectively into improvements in well-being. As a performance monitoring tool, this indicator could be used to illustrate the impacts of unsustainable GDP growth and to determine how accumulating environmental and social costs can lead to "uneconomic" growth. Existing growth studies for policy development could be revisited with GPI substituted for GDP, in order to explore the effects of policy changes through a broader lens on economic welfare. Cost-benefit or other economic analysis that uses GPI instead of GDP could bring more public support for policies that support non-market activities, human capital creation, and environmental benefits.

Regional and Local GPI Applications

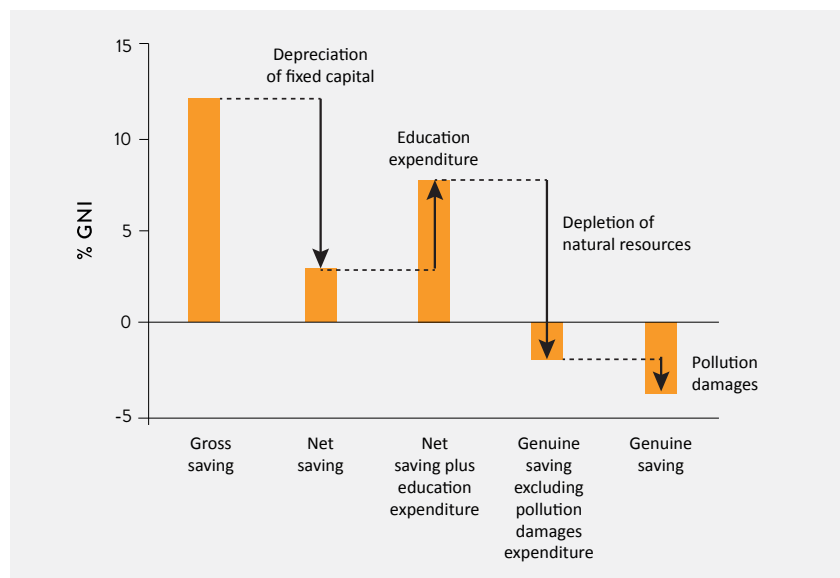
GPI was originally designed as a national level tool, but it has been applied in sub-national settings as well in the United States, England, Italy, and China.⁵⁴ At the sub-national level, GPI has proven valuable for comparing performance across regions and making decisions based on regional variation in economic, environmental, and social progress. Regional estimates can complement national figures by highlighting which areas are experiencing more or less progress, perhaps at the expense of neighboring areas. A primary impact of sub-national GPI studies is to encourage debate about what constitutes sustainable economic welfare and how communities can achieve it.⁵⁵

U.S. estimates at the city and state level encounter more data availability issues than national estimates, but the results are still useful. Many of the factors influencing regional GPI are most effectively dealt with through national-level policies; at the same time, local estimates can inform discussions in national settings and further demonstrate GDP's limitations. GPI can also be used as a basis for formulating state budgets, and as a lens for viewing the potential impacts of local policy decisions. This is happening in Maryland, where, in 2010, the state government began officially reporting GPI as an index for sustainable prosperity.⁵⁶ Departments are now considering how quality of life and economic development can be pursued without negatively impacting Maryland's natural capital or non-market value-flows.

Genuine Saving

National accounting is important for reviewing national investment policies and gauging whether the country is accumulating wealth over time by increasing the value of its assets. Standard accounting practices, however, produce an unrealistic picture of the assets available to U.S. society by focusing narrowly on human-made capital and its depreciation. Genuine Saving, also called Adjusted Net Saving, takes a different approach, measuring the depreciation of natural capital, damage caused by pollution, and investments in human capital as components of the nation's wealth.⁵⁷ The framework accounts for natural and human capital as valuable assets upon which economic productivity depends, focusing on stocks of wealth as opposed to flows of income or consumption. The Genuine Saving rate (See Fig. 7) begins with Net National Saving (gross national saving minus depreciation of fixed capital), and adjusts this number by adding education spending (which gener-

FIGURE 7. BOLIVIA'S GENUINE SAVINGS RATE, WITH ADJUSTMENTS FOR EDUCATION SPENDING AND NATURAL RESOURCE DEPLETION AND DAMAGES, WAS APPROXIMATELY **-3.8** PERCENT IN 2003, INDICATING THAT THE COUNTRY IS ON AN UNSUSTAINABLE GROWTH PATH.



ates human capital for future welfare, and so should be treated not as a cost but as a form of savings) and by subtracting natural capital losses and damages (mineral depletion, energy depletion, net forest depletion, carbon dioxide damage, and other emissions damage). It then measures genuine saving as a percentage of gross national income to calculate the genuine saving rate for a given country.

With this broader view of what constitutes valuable national assets, a country that appears to be a net investor in future productivity may actually be found to have a negative Genuine Saving rate, indicating that it is drawing down the value of its resources. The depletion of a nonrenewable resource without investing a portion of the money generated into a renewable replacement decreases the value of the resource stock and cannot continue indefinitely. In the same way, environmental degradation that occurs as an impact of human activities decreases the value of natural resources. Genuine Saving accounts for these changes and costs related to environmental assets, providing a clearer picture of whether a country is getting richer or poorer as a result of its policies.

The primary policy application for Genuine Saving is in the area of sustainable economic development. Investment and government spending policies based on the value of a broader scope of assets could, for example, count expenditures on education as a form of savings rather than consumption. The high-level information provided by Genuine Saving measures could help policymakers manage public and private assets to avoid resource shortages resulting from domestic over-consumption or underinvestment. This approach is sometimes criticized, however for failing to capture the global nature of sustainability and the unique issues facing resource-exporting countries in contrast with developed countries.

Policies designed to increase Genuine Saving in the United States would involve more optimal, prudent management of natural resources—extraction would take into account the potential for exhausting a resource, and development of renewable resources would be increasingly viewed as an investment in future productivity and well-being. Much more economically significant, however, is the focus on human capital as a form of national wealth—human capital is by far the single largest component of our total capital. Thus, robust education programs may create costs in the present, but in expanding human capital and thereby the asset-base for future growth, these costs can be seen to be relatively trivial in the long run; indeed they are not costs at all but investments. Conversely, declining investment in education leads to reductions in national wealth that undermine future growth and well-being. In accounting for human capital investments, the Genuine Saving approach gives us a picture of net national wealth-creation in a given period—helping us see whether we are increasing our wealth or spending it down. As of 2008, the Genuine Saving rate of the United States was less than 1 percent, putting us very near the threshold of net wealth decline.⁵⁸

CONCLUSION: NEW MEASURES FOR A NEW ECONOMY

As Joseph Stiglitz stated upon release of the report of the Commission on the Measurement of Economic Performance and Social Progress, “what you measure affects what you do,” and if “you don’t measure the right thing, you don’t do the right thing.”⁵⁹

In 2012, we have reached an important turning point in this debate, as an emerging technical consensus about the problems with GDP has captured the attention of political leaders and the media, and government engagement with alternative measures has taken hold on many levels.

But all of this plays out, of course, in a political struggle over what governments support and who benefits. Clearly, advancing national accounting reforms and other alternative measures, as outlined here, is not simply a matter of technical changes that will fix things on their own. Rather, these changes will be integral to transforming our politics—broadly, making it more and more difficult for politicians, business leaders, and the media to hide behind GDP growth while ignoring deteriorating household living standards and well-being, unsustainable environmental impacts, and the social disarray caused by public disinvestment in non-market goods like parenting, education, health, and other key sources of human and social well-being. As people begin to gauge their lives by the new measures of progress, policy and politics will have to answer to the public in new ways. That is certainly the hope of the proponents of new indicators. Whether the hope becomes a reality depends on how much progress we make in implementing and utilizing new measures in the key policy settings for our families and communities.

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