

Alternative Indicators of Economic Welfare

By
Jerry Brian
Janet Hou
Jeff Milder
Michelle Upton

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Gross Domestic Product and its Shortcomings

Gross Domestic Product (GDP) is an economic indicator that measures the earnings and profit of production that takes place within a given country. As the dominant accounting framework and gauge for measuring the wealth and status of a nation, GDP represents a primary feedback mechanism and driver of national policy. Because an increase in GDP is seen as an increase of the well-being of a nation, GDP defines the economic priorities and problems of national policy. These policies are driven by the idea (rhetoric) that what is good for the market is good for GDP, and what is good for GDP is good for the people. This paper begins by examining whether GDP is an accurate measure of economic, social, and environmental welfare. It then analyzes two alternative economic welfare measures—the Index of Sustainable Economic Welfare (ISEW) and the Genuine Progress Indicator (GPI)—and explores whether these alternatives to GDP are more accurate measures of well-being and progress. Throughout the paper, we focus on the environmental aspects of economic indicators, and whether alternative economic indicators represent a viable environmental strategy.

To better understand the nature and prevalence of GDP as an indicator of national well-being and driver of policy decisions, it is useful to examine the modern history of economic measurement and the origin of GDP. Throughout history, different forms of economic measurement have evolved according to the circumstances and beliefs of the time. Measurements of national accounts have changed significantly over the past 300 years, from including only agricultural production, to including manufacturing, trade and finance, to now including all production and services that take place in the market economy (Cobb et al. 1995). What we now call GDP was first developed under the name of Gross National Product (GNP – see below for a discussion of the differences) during the 1930s, when government and private experts could not address key economic questions in the U.S. posed by Congress with the then-current system of data. The U.S. Commerce Department assigned Simon Kuznets to develop a more comprehensive system of national accounts that would serve as the accounting framework for the nation's economic policy.

The system of accounts developed by Kuznets became the model for GNP. The GNP not only became the main determinant of U.S. economic policy by the mid-20th century; it is also credited with helping the U.S. recover from the Great Depression and win World War II. During the war, information provided by GNP figures allowed the U.S. to locate unused production capacity and achieve production levels initially thought to be impossible. Similarly, the lack of a sophisticated national accounts system is thought to have contributed to the demise of Hitler, who set production targets much lower than the U.S. (Cobb et al. 1995). These events, along with the Employment Act of 1946, have determined the accounting framework of economic policy for the past 50-plus years.

In 1991, GDP replaced GNP as the dominant macroeconomic measurement tool in the U.S. (and worldwide). GDP shifted the earnings of a firm from the country where it is owned to the country where the economic activity of the firm takes place. This change had major effects on the international economy as well as on national measures of the progress: developing countries that were the site of overseas production units for firms headquartered in developed nations suddenly moved from positions of little economic activity to becoming “statistical boomtowns.” This, in turn, increased the emphasis on the global marketplace as international strategies by institutions such as the World Bank turned towards increasing GDP as a way to improve the well being of nations.

Worldwide, GDP is now firmly entrenched as the dominant benchmark for the welfare of people and nations.

Despite its foundation as the main driver of national and international economic policy, the GDP is not without numerous and widely acknowledged shortcomings. While GDP measures the total economic activity that takes place within a country, it does not provide a measure of the quality or costs of growth. By adding everything that takes place in the market as economic activity that benefits society, the GDP does not distinguish between sustainable and unsustainable activities or between the actual costs and benefits of such activity. For example, forests provide many economic benefits such as clean air, clean water, wildlife habitat, and recreation opportunities, but GDP only includes the value of harvested timber as contributing to economic and social well-being (Costanza 1995). As

evidenced by a World Resources Institute study of Indonesia in 1989, which showed that the country achieved extremely high levels of economic growth by depleting nonrenewable mineral wealth, clear cutting its forests, and stripping topsoil by intensive farming, GDP creates perverse incentives for mismanagement of resources that create unmeasured environmental and social costs, at the expense of future generations, in the name of economic development (Cobb et al. 1995). GDP provides a framework that rewards those firms and nations who deplete and pollute by portraying these activities as progress.

Other examples of how “down becomes up” under the GDP include the billions of dollars spent cleaning up the Exxon Valdez oil spill that contributed to GDP, the Wall Street Journal’s estimate that the O.J. Simpson trial in 1996 added \$200 million to GDP, and the GDP boom provided by the over-fishing of cod populations in the North Atlantic until the fishery collapsed (Cobb et al. 1995, Costanza 1995). As noted by Herman Daly, a former World Bank economist, “the current national accounting framework treats the earth as a business in liquidation.” (quoted in Cobb et al. 1995) Under GDP, pollution makes multiple contributions to economic growth while natural resource conservation comes at the expense of potential economic activity, a notion that perpetuates environmental problems while wrongly implying that economic and ecological goals are almost always at odds with one another.

While this discussion has focused on some of the environmental shortcomings of GDP, there are also numerous well-grounded criticisms of GDP’s failure to measure social progress and “quality of life.” Overall, “[t]here is a strange paradox in the interpretation of GDP. Hardly anyone would argue explicitly that GDP measures economic welfare, but everyone is using it in a way as if it did.” (Stockhammer et al. 1997) When it was developed in the 1930s, GDP was not meant to be an indicator of economic health (Hanson 1995); it was created and used to find untapped resources to help the nation recover from economic depression and win a war (Cobb et al. 1995). Today’s circumstances have now made the GDP an outdated tool: our economy is no longer faced with a crippling depression or world war, and environmental and social concerns now

play as large a role, if not larger, as economic concerns in determining the citizens' quality of life.

For environmentalists, policy makers' reliance in GDP is a major problem because this index essentially rewards policies that encourage the plundering of natural resources while responding negatively to many types of environmental regulations, incentives for resource conservation, and sustainability initiatives. Thus, alternative economic indicators that better account for factors such as environmental quality and sustainability are an important environmental strategy—one that has the potential to influence environmental policy in almost every arena, from local to international. Ideally, well-devised alternative economic indicators should facilitate policies and institutional changes that promote activities where the needs of society, the economy, and the environment can simultaneously be met.

An Introduction to Two Alternative Economic Welfare Indicators

This section of the paper describes and discusses the two leading alternative economic welfare indicators currently in use—the Index of Sustainable Economic Welfare (ISEW) and the Genuine Progress Indicator (GPI). The purpose of both indicators is the same: to portray economic progress (or the lack thereof) more accurately by accounting for those factors that affect the quality of life and our ability to sustain it into the future. While Gross Domestic Product and Gross National Product only measure factors that are commonly quantified in dollar terms by the marketplace, ISEW and GPI seek to quantify other factors that are hard to place a number on, such as pollution, crime, family breakdown, and community involvement. As stated in a 1995 article in *The Atlantic Monthly* on alternative progress indicators “the result is a balance sheet for the nation that starts to distinguish between the costs and the benefits of ‘growth.’” (Cobb et al. 1995)

Theory behind the ISEW and GPI is based on a different notion of income than that implied by GDP. Whereas GDP measures the total monetary valuation of all production that is ordinarily transacted in the marketplace, the ISEW and GPI are more interested in

the actual utility of that production to humans for improving the quality and enjoyment of life. Thus, these alternative indicators attempt to include non-market goods and services that have utility to humans while excluding monetarily-valued production that has zero or negative utility to humans. For example, money spent to clean up environmental disasters (e.g., the Exxon Valdez oil spill in Alaska) or build more prisons would be considered a cost rather than a benefit, and thus not counted toward overall economic welfare. In addition, ISEW and GPI incorporate the notion of sustainability: that is, not only must today's production not undermine our capacity to produce and consume an equal amount in the future; it must also set aside adequate resources to compensate for the ecological unsustainability of current production activities (Lawn 2003). In this sense, ISEW and GPI account for costs that are ordinarily external to the market, such as the environmental degradation associated with burning fossil fuels.

ISEW and GPI were both developed by economics scholars, though in slightly different contexts. Economists Herman Daly and John Cobb, Jr. first described the ISEW in their 1989 book *For the Common Good*. Although other economic welfare indicators had been proposed earlier as alternatives to GDP (e.g., the Measure of Economic Welfare by Nordhaus and Tobin in 1972 and the Economic Aspects of Welfare by Zolotas in 1981), ISEW was the first to be embraced by ecological economists and applied to numerous contexts. The non-profit organization Redefining Progress (based in Oakland, California) developed the GPI in 1995 as essentially a second-generation version of the ISEW. According to their mission statement, Redefining Progress works with “a broad array of partners to shift the economy and public policy towards sustainability.” The group’s programs work to accomplish these goals by measuring the real state of the economy, environment, and social justice; designing policies to foster sustainability; and promoting and creating new societal frameworks. The overarching goal of Redefining Progress’ vision is to pursue “systemic change in underlying economic, political, and social mechanisms.”

Description of ISEW and GPI

Currently, both the ISEW and GPI remain in use. GPI has been used more widely in the U.S., whereas ISEW has been calculated for many of the European nations plus the U.S. and Chile (Jackson and Stymne 1996, Castaneda 1999). Both the ISEW and the GPI use five basic groups of terms in their calculation, although the individual terms used in each index vary somewhat (see Table 1). In addition, the indices have been calculated in slightly different ways for different nations and states, primarily because of differences in the availability of data from place to place. The five basic categories included in both indices include the following:

- A. Consumption base:** Whereas GDP is based on production, ISEW and GPI use consumption as the starting point because it is thought to be more closely linked to human welfare. Consumption is adjusted up or down to reflect relative changes in income equality or inequality over time.
- B. Additions for Services Not Counted as Consumption:** This group of terms adds goods and services that provide utility for humans but are not included in GDP because they lie outside of the conventional marketplace. ISEW and GPI differ somewhat on what terms they include in this category.
- C. Subtractions for Implicit Overestimates of Welfare:** This category subtracts expenditures that are included in GDP but do not add to human welfare (such as expenditures to prevent or mitigate crime or pollution), as well as costs that are not normally monetized but negatively affect human welfare (such as the costs of commuting and noise pollution).
- D. Subtractions for Depletion of Natural Resource Base:** This is the “sustainability” factor that attempts to subtract for aspects of current consumption that compromise the ability of future generations to meet their needs—such as depletion of natural capital and environmental degradation.
- E. Adjustments for Capital Accumulation and Flow:** These terms account for net capital flows and their sustainability.

Table 1: Summary of ISEW and GPI Calculations, With Commentary

Description of Factor	ISEW	GPI
A. Consumption Base		
Personal consumption (different from GDP, which measures production)	✓	✓
Income distribution adjustment based on the premise that a unit of margin consumption adds more to the value of a poor person's life than a rich person's life. "Redefining Progress is making an explicit ethical argument that growing income inequality represents a social cost."(Anielski and Rowe 1999)	✓	✓
Weighted personal consumption: personal consumption divided by the income inequality adjustment factor	✓	✓
B. Additions for Services Not Counted as Consumption		
Value of household labor including meal preparation, cleaning, laundry, repairs, shopping, banking, gardening, care of family, and traveling to obtain goods and services. "It is an attempt to capture the benefits to society from work in the home."(Costanza et al. 2003)	✓	✓
Value of volunteer work done in communities, schools, churches, and neighborhoods		✓
Services of household capital (durable goods such as home improvements, major household appliances, and cars). This calculation values durable goods based on their service, not their initial production or purchase. Thus, whereas GDP would value ten washing machines that each last 5 years more than one that lasts 50 years, ISEW and GPI would value the single long-lived machine more highly. This method of calculating the value of durable goods favors a service-based economy such as that heralded by Interface Carpet, a corporation that sells floor-covering services rather than carpet products that have a short life-cycle and are soon disposed of.	✓	✓
Services of highways and streets	✓	✓
Public expenditures on health and education. Only certain expenditures are included. "Defensive expenditures" such as health care costs necessitated by economic activities (e.g., treating asbestos-related illness) or education sought by individuals to obtain a job but that does not contribute markedly to human capital are excluded.	✓	
C. Subtractions for Implicit Overestimates of Welfare		
Cost of crime , in the form of legal fees, medical expenses, damage to property, or psychological trauma		✓
Cost of family breakdown , such as divorce or separation of		✓

Description of Factor	ISEW	GPI
parents, which has a negative effect on the cohesion and strength of the economy		
Loss of leisure , which is a cost because it increases stress levels and reduces relaxation and involvement in non-market activities		✓
Cost of underemployment : the portion of the workforce that accepts a job below their qualifications is considered underemployed		✓
Cost of consumer durables : this figure is offset by the services provided by these goods – see above	✓	✓
“Defensive expenditures” on health and education – see above	✓	
Expenditures on national advertising . Local advertising is considered to provide useful information and thus included in the ISEW.	✓	
Cost of commuting , which decreases time available for working, socializing, recreating, or relaxing	✓	✓
Cost of urbanization related to inflated land prices, which add dollars to the economy but no value	✓	
Cost of household pollution abatement : includes items such as air and water filters, which compensate for increasing pollution		✓
Cost of automobile accidents : direct and indirect impacts on society that include total amount of property damage and health care expenses as a result of accidents. Indirect expenses include lost wages while unable to work and any additional pain.	✓	✓
Cost of water pollution , determined by estimating the benefits derived from clean water	✓	✓
Cost of air pollution , measured by the Pollutant Standards Index, which is an index of ambient pollution levels	✓	✓
Cost of noise pollution linked to urbanization	✓	✓
D. Subtractions for Depletion of Natural Resource Base		
Loss of wetlands , which provide habitat, water quality benefits, and aesthetic benefits	✓	✓
Loss of farmland , which is essential to the concept of sustainability and productivity. Loss is measured by permanent removal of farmland from production (e.g., because of urbanization) as well as declining fertility due to poor land management.	✓	✓
Depletion of nonrenewable resources : cost to future generations of not having these resources available	✓	✓
Long-term environmental damage from global climate change, nuclear waste, ozone destruction, and other permanent or semi-permanent forms of ecosystem degradation	✓	✓

Description of Factor	ISEW	GPI
Loss of old growth forests		✓
E. Adjustments for Capital Accumulation and Flow		
Net capital investment to measure economic prosperity by the amount of capital available to each worker in a geographical area	✓	✓
Net foreign lending and borrowing: measures the level at which a nation depends on foreign funding to finance current consumption	✓	✓
= Total GPI or ISEW		

Trends in Alternative Economic Indicators

As mentioned above, alternative economic indicators have been calculated for several nations. Figures 1 and 2 present trends in GPI for the United States and trends in ISEW for six industrialized nations, respectively. The trend lines for the different nations reveal some similarities and some differences, which underscore some of the ways in which GPI and ISEW differ from GDP. In the U.S., per capita GPI has increased only moderately and per capita ISEW has grown even less since 1950, while at the same time per capita GDP has tripled. Major reasons for this discrepancy include the growing costs of urbanization and industrialization, such as pollution, resource depletion, environmental degradation, and commuting. Income inequality also played a major role both in the increase in the alternative indicators in the 1960s (when the “Great Society” programs redistributed wealth to the poor) and the subsequent drop in the indicators in the 1980s (when wealth disparities became more pronounced).

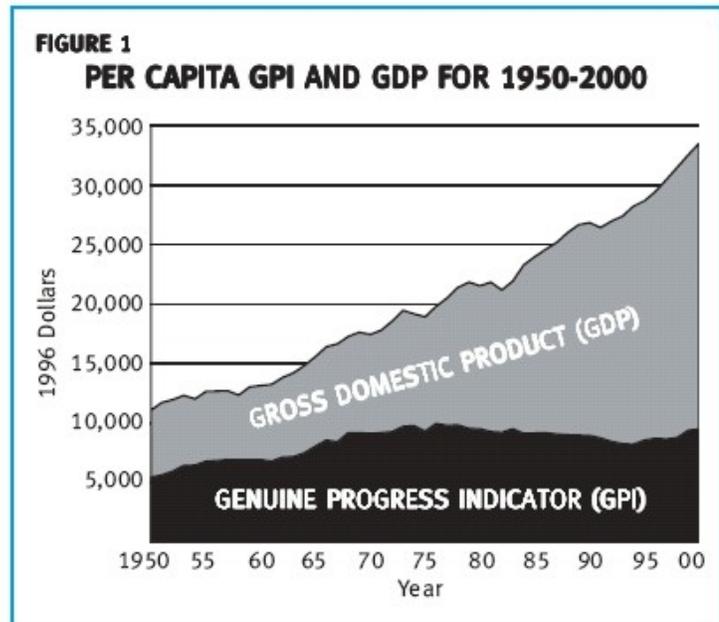


Figure 1: Per capita GPI and GDP in the U.S., 1950-2000. Source: Cobb et al. 2001.

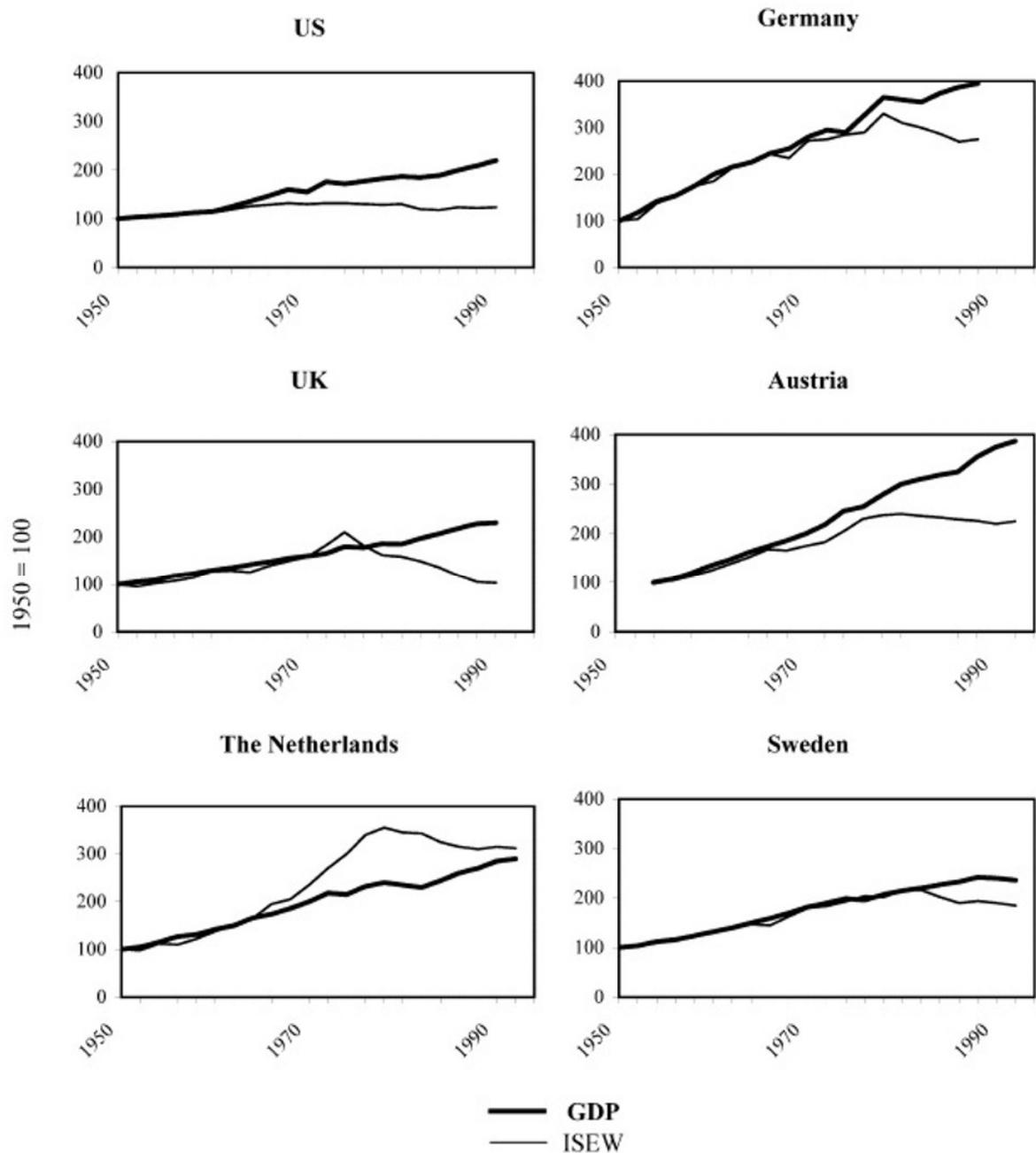


Figure 2: GDP and ISEW in six nations, 1950-1992. Source: Lawn 2003, based on data in Jackson and Stymne 1996.

For the five European nations shown in Figure 2, per capita ISEW trends have followed a remarkably similar pattern: increasing until around 1980 and then declining either moderately (Austria) or quite sharply (U.K.). Again, these trends are explained by a

combination of growing wealth inequality (although aggressive social programs in Sweden have allowed this nation to increase per capita ISEW almost as fast as per capita GDP), environmental degradation, and other social and environmental costs. These trends support what economists have termed the “threshold hypothesis”: namely, that economic growth only improves human wellbeing up to a point, and beyond that point, the benefits of additional growth are offset or even surpassed by the costs and impacts of that growth (Castaneda 1999). Other economists have disputed this hypothesis by questioning the validity of the alternative progress indicators (Neumayer 1999, Neumayer 2000), but until these critics propose a revised indicator that adequately accounts for the external factors and sustainability issues not included in the GDP, the balance of evidence appears to favor the threshold hypothesis.

In addition to the national studies discussed above, alternative economic indicators have been used at the state level in the U.S., as well. In October 2003, the University of Vermont (including the School of Business Administration, Environmental Program, School of Natural Resources, and the Gund Institute for Ecological Economics) published a research paper entitled *Estimates of the Genuine Progress Indicator (GPI) for Vermont, Chittenden County, and Burlington, from 1950-2000*. This paper studied the growth of Vermont by calculating each of the twenty-six factors needed to determine recent trends in GPI. The main conclusion from the paper was that “GPI is a significantly different and more comprehensive approach to assessing economic progress than conventional measures like GDP...it is a better approximation to economic welfare than GDP, because it accounts for income distribution effects, the value of household and volunteer work, cost of mobility and pollution and the depletion of social and natural capital.” (Costanza et al. 2003)

Critique of ISEW and GPI

Critics of the ISEW and GPI have raised a number of objections to the use of these indices, but a close examination reveals that most of these criticisms hold true as much, if not more, for GDP as for the alternative indicators. First, there is concern about reducing

a wide range of diverse factors to a single number—what Daly and Cobb (1989) called the “fallacy of misplaced concreteness.” A related concern is the tendency of the indicators to monetize things that many people would argue are priceless, such as human life, leisure, or the wellbeing of future generations. While it is difficult to argue with these criticisms on a philosophical level, there are compelling policy reasons to overlook these shortcomings in practice. In the past, the inability or unwillingness of environmentalists to quantify and then monetize the costs of economic activity to the environment and human health usually meant that policy makers either ignored these factors or gave them less weight than they deserved. Environmentalists are wise to speak the language of economists and policy makers if they wish to promote their agenda.

Second, critics take issue with many of the assumptions that are necessary to calculate the ISEW and GPI. Daly and Cobb themselves admit this shortcoming. One set of assumptions—the “technical” assumptions used to estimate the magnitude of various costs and benefits—can eventually be replaced by better data on the true costs and benefits of these factors. But a second set of assumptions are essentially subjective judgments about the true value of assets such as leisure, family, different types of education, income equality, and the need to provide a habitable world to future generations. As Lawn (2003) points out, “Subjective judgments about what contributes to human well-being are common to all indicators.” This is true of the GDP, too, despite attempts by economists to dress this indicator in a gown of “objectivity.”

Finally, ISEW and GPI, like GDP, fail to account for costs and benefits that are exported to a different place. This problem is apparent whenever an indicator is calculated for a state or nation that has interactions with other states or nations (which is always). A logical solution would be to calculate a global ISEW or GPI that internalizes all costs and benefits of market and non-market activity worldwide. Such a project, undertaken perhaps by the United Nations, could be used to guide national and international policies toward long-term economic sustainability and human welfare.

Conclusions: Policy and Implementation Issues for Alternative Indicators

As we discussed earlier, GDP contains many flaws as an indicator of progress. GDP fails to take into account non-market goods and services, such as clean air and water, happy families, and quality of life—or to account for negative aspects of economic activity such as less time spent with family and increasing pollution. These negative factors might boost GDP through wages, consumption, and clean-up, even though they provide disutility to the public. Thus, the GDP indicator essentially takes negatives and counts them as positives in the national accounting system. Many Americans know this intuitively, even if they have little or no knowledge of GDP: despite the economic boom in the 1990s and the rise in GDP, the public felt little optimism; in fact, polls indicated that “more than 70 percent of the public was gloomy about the future.” (Cobb et al. 1995)

The alternative indicators presented in this paper seek to include important environmental and social concerns when determining economic productivity and welfare. For example, instead of counting any transfer of money as a positive, the ISEW and GPI count the costs of environmental clean-up, lawyers fees, and restructuring after an environmental disaster as negative amounts. By the same token, the ISEW and GPI include financial gains resulting from domestic work (e.g. taking care of children and elderly) and crime prevention measures. These alternative indicators provide the public and policy-makers with a more accurate picture of the economic, social, and environmental standing of a nation. Moreover, they eliminate the perverse incentives that can arise from GDP: for example, developing nations may have no incentive to enact pollution prevention policies if they know that pollution usually adds to GDP (Henderson 1996).

Despite the theoretical soundness and policy benefits of adopting alternative economic indicators such as ISEW and GPI, there are several implementation challenges and issues that cannot be ignored. First, depending on which indicator is used, a country’s overall well-being could change quite dramatically. For example, Hanley et al. (1999) compared seven different indicators to determine Scotland’s overall economic and environmental health. Depending on which indicator is used, Scotland is either doing well and improving, is unsustainable and worsening, or is more or less static. In order for

alternative indicators to be useful, one indicator must be agreed upon—otherwise there will be no basis for comparison over time or between countries. This inconsistency could be especially problematic for developing countries, which often use economic indices as a means to obtain funding for development projects and to determine what the focus of these projects should be (Cobb et al. 1995).

A second concern is the difficulty in assigning monetary value to non-market goods and services that currently have no dollar valuation, such as clean air or leisure time to spend with family and friends. Non-market goods and services are the subject of a growing but controversial field of valuation. Although many research institutions and organizations are working on methods to value these goods and services in dollar terms, there remain numerous theoretical and technical challenges to overcome. While the valuation of certain non-market goods is inherently subjective (for example, one person's valuation of leisure may be very different from another person's), GDP is no less subjective: by excluding certain goods and services from the index, GDP implicitly places a zero dollar value on them.

This valuation problem gives rise to a third, larger issue: scaling up from the local setting to the national setting, and from the national setting to the global setting. Scaling up from the local or state to national setting may not be so difficult an endeavor. The people of a nation tend to place similar values on certain goods, services, and amenities, so surveying and averaging the values from around the nation could provide a fairly accurate and consistent depiction of what the nation values. However, at the global scale, different cultures, standards of living, and perspectives complicate matters exponentially. What one country values as a good could very well be a bad for another country, which raises the question of what should be included and excluded in any economic index. The difficulty in resolving these difference stands in the way of creating an indicator that will be accepted worldwide. This problem is more serious than the equivalent concerns for GDP since some of the items included in the alternative indicators relate directly to a nation's tradition, identity, and history (e.g., the extent to which leisure is valued versus hard work), whereas the GDP variables are less socially-based.

Finally, alternative indicators alone should not be seen as a panacea that will radically change consumption behavior. Currently, most people do not rely on the GDP when making decisions about what they should or should not buy or consume. For example, even though the U.S. is now experiencing rising gasoline prices, an economic recession, and serious concerns about air pollution, Americans are still purchasing sport-utility vehicles and engaging in energy-wasting behavior. However, alternative indicators do have the potential to affect behaviors and lifestyles indirectly by influencing changes in policies and institutions. For example, Daly and Cobb (1989) point out that the Clean Air Act of 1970 was contributing \$7.5 billion per year to the ISEW by 1986 in terms of reduced costs of pollution. Similarly, alternative indicators would indicate to policy makers how different types of environmental and social degradation are harming the nation's economy and overall wellbeing. They would then have a strong incentive to craft policies to reverse these declines.

Overall, the future of alternative indicators looks positive. As environmental and social concerns are brought to the forefront, the demand that economic indicators include factors that affect daily lives and not just market-based monetary transactions will increase. What remains to be seen is whether individual nations—or even the world as a whole—will be able to agree upon a single alternative indicator. With this question in mind, Reed (2000) recommends that the first step toward implementing alternative indicators should be to raise awareness of these indicators and reach consensus on which factors should be included. Despite the challenges and implementation issues noted in this paper, the inclusion of environmental and social factors, both positive and negative, in economic indicators will improve our understanding of sustainable progress and how it can be better pursued in our nation and in the world.

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