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Can the Genuine Progress Indicator better inform sustainable regional progress?—A case study for Northeast Ohio

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ABSTRACT

Cities and regions are increasingly accounting for the diverse economic, social, and environmental contributions to sustainability and quality of life. However, most commonly used socioeconomic and environmental indicators are either difficult to use in policy or fail to comprehensively reflect social well-being and environmental sustainability. This paper articulates the limitations of urban and regional indicator sets and macroeconomic measures like the Gross Domestic Product (GDP), presents an alternative indicator, the Genuine Progress Indicator (GPI), and develops, improves and applies it for Northeast Ohio. We calculate the GPI for the State of Ohio, cities of Akron and Cleveland, and 17 Northeast Ohio counties for the years 1990–2005. We evaluate temporal and spatial GPI trends, including inter- (Ohio versus other comparable U.S. local GPI studies) and intra-regional (urban–suburban–rural) comparisons. From 1990 to 2005, we found that per capita GPI grew in 11 counties and the State of Ohio (growth ranging from 0.8% to 19.7%) but declined for six counties and the cities of Akron and Cleveland (declines ranging from 0.6% to 22%). Per capita GPI was greatest in suburban counties and lowest in urban areas, and was greater in Maryland and Vermont than Ohio.

These trends are largely driven by gains in personal consumption versus other environmental, social, and economic costs. Important costs include income inequality, climate change, nonrenewable resource depletion, and consumer durables. The GPI is increasingly being estimated at local scales to complement existing urban indicators by providing a common monetary basis for measuring diverse costs and benefits. Finally, we report the effect of renewable portfolio standards and conversion of vacant lots for urban agriculture on the GPI through a series of scenario analyses at the county and city scales. These scenarios demonstrate how GPI can be used as a decision tool for local and regional development. In addition, local GPI measures offer opportunities to better engage the public and decision makers in discussions about economic, social, and environmental goals and policies.

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1. Introduction

1.1. Measuring urban and regional progress

The dominant regional development pattern of recent decades – urban decentralization, with each city and suburb competing for jobs, wealth, and income – has not necessarily led to environmental sustainability or high quality of life in many parts of the United States (Ewing, 1997). Emerging fiscal austerity, rising energy costs, and environmental threats like climate change suggest the importance of policies aiming to maximize social well-being rather than simply consumption and urban expansion based on traditional economic indicators. To this end, a growing number of regions have developed programs to track economic, social, and environmental indicators at neighborhood, city, and metropolitan regional scales (Coughlin, 1973; Maclaren, 1996; Sawicki and Flynn, 1996; Sustainable Measures, 2006). The underlying assumption behind these indicators is that to meet the needs of their residents and remain economically competitive, regions should work to improve quality of life for their inhabitants. This goal stands in contrast to the business-as-usual practice of tracking indicators such as Gross Domestic Product (GDP) and viewing its growth as a primary economic policy goal. Recognizing the failure of GDP to account for social well-being or environmental sustainability, an increasing number of economists have proposed alternative national-scale macroeconomic indicators to measure progress and guide policy (Daly and Cobb, 1989; Talberth et al., 2007). Alternatives indicators to GDP are also gaining increasing attention in the international community (Stiglitz et al., 2009; Michalos et al., 2010). Economic indicators that address sustainability and social well-being are

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increasingly being adapted to smaller geographic scales, suggesting the need to better integrate this work with the development of urban indicators.

Economic, social, and environmental indicators can provide a more nuanced view of regional progress, while bringing together different stakeholders in planning for the future. Where these initiatives enjoy strong citizen support and government involvement, they have the potential to serve as effective policy guides while capturing public interest in regional quality of life agenda. Long-running efforts in Oregon and Minnesota, for instance, have involved substantial public input and explicit government backing. However, since it is impossible to aggregate disparate economic, social, and environmental measures (e.g., volunteer work, crime rates, and loss of farmland), tradeoffs are difficult to compare and aggregate progress is hard to track. As such, monetary-based economic indicators, such as GDP, have often been more effective and dominant guides to policy.

In this paper, we further develop the Genuine Progress Indicator (GPI) as an alternative to GDP in measuring economic development at urban and regional scales. While the GPI is not a comprehensive indicator of sustainability, it can provide greater insight into various elements that contribute to sustainability. Our goal is to show how GPI can be developed as a locally-relevant policy tool for measuring progress and supporting decision making.

1.2. Limitations of Gross Domestic Product

GDP is most recognized as a national-level macroeconomic indicator, but in the United States it has been measured for states dating back to 1963 and for metropolitan areas since 2001. While GDP is useful as an overall indicator of macroeconomic activity, economists and politicians, including some of its original architects have noted the misuse of GDP as a measure of welfare. Common criticisms of GDP include: (1) simple addition of all expenditures, even "defensive expenditures" that do not improve social welfare; (2) exclusion of the value of unpaid household labor and volunteer work in the community; (3) addition of the value of nonrenewable resource depletion while total resource stocks decline over time; (4) failure to account for income distribution, poverty, and the costs of inequality; (5) a lack of inclusion of the positive contributions from natural, human, and social capital and the benefits of further investments in these capital types (Anielski, 2007). Additionally, a growing body of literature suggests that increased wealth and economic output alone do not always improve quality of life or subjective well-being for individuals or society (Diener et al., 1999; Kahneman et al., 2004; Easterlin, 2005).

While GDP growth is rarely an explicit goal at the urban and regional scale, this indicator still permeates the media and political dialogue to a far greater extent than others. This is at least partly due to the clarity in reporting change in a single number, as opposed to dozens of individual social, economic, and environmental indicators.

1.3. Alternatives to GDP and existing urban indicators: the Genuine Progress Indicator

Given GDP's shortcomings, economists have attempted to adjust GDP to better measure society's well-being. Notable work includes Nordhaus and Tobin (1972) Measure of Economic Welfare (MEW) and Daly and Cobb (1989) Index of Sustainable Economic Welfare (ISEW), which was later revised as the Genuine Progress Indicator. The ISEW/GPI (hereafter referred to as GPI) begins with a measure of personal consumption, weighted to account for income inequality, and deducts or adds the economic value associated with various economic, social, and environmental costs and benefits (Table 1). Monetary values for these nonmarket economic, social, and environmental factors are typically obtained using methods reported in the environmental and ecological economics literature. GPI can be expressed in the form of the equation (adapted from Hanley et al., 1999):

$$\mathrm{GPI} = C_{\mathrm{adj}} + G + W - D - S - E - N$$

where C_{adj} = personal consumption adjusted to account for income distribution, G = growth in capital and net change in international position, W = non-monetary contributions to welfare (e.g., household labor, volunteer work), D = defensive private expenditures, S = depletion of social capital (e.g., cost of crime, family breakdown, lost leisure time), E = costs of environmental degradation, and N = depletion of natural capital.

The inclusion of these indicators makes GPI better suited than GDP to address questions of equity, societal well-being, and environmental sustainability within the economy. Daly and Cobb and subsequent authors found that GPI grew at a slower rate than GDP until the mid-1970s and has since leveled off or declined slightly. These results agreed with Max-Neef's (1995) "threshold hypothesis," which states that economic growth improves quality of life up to a point, but eventually erodes environmental and social quality, reducing quality of life. ISEW/GPI studies in numerous other nations found similar results (Jackson and Stymne, 1996).

Although GPI was originally developed as a national-level macroeconomic indicator, economic costs and benefits are not distributed evenly across a nation or region. Interest in understanding these local and regional differences and informing urban and regional policy has led to development of local-scale GPI studies, particularly as the quality and availability of local data have improved. In the U.S., GPI has been estimated locally for Minnesota (Minnesota Planning Environmental Quality Board, 2000), the San Francisco Bay area (Venetoulis and Cobb, 2004), Vermont (Costanza et al., 2004; Bagstad and Ceroni, 2007), and Utah (Berik and Gaddis, 2011). The State of Maryland, a leader in U.S. smart growth policy, became the first government-sanctioned GPI effort in 2010 (Maryland Genuine Progress Indicator, 2010; Posner and Costanza, 2011). Outside the U.S., local GPI and ISEW studies have been conducted in Australia (Lawn and Clarke, 2006), Canada (Anielski, 2001; Mead, 2011), China (Wen et al., 2007; Yu et al., 2010), Italy (Pulselli et al., 2008), New Zealand (McDonald et al., 2009), and the U.K. (Jackson et al., 2008).

1.4. Measuring GPI at urban and regional scales

Since GPI was developed as a national-scale indicator, it should be applied carefully at local scales (Clarke and Lawn, 2008). Consistent data sources and methods should be used. Cross-boundary impacts of manufacturing, energy production, and resource extraction should be considered if possible (Clarke, 2007). Local governments do not have full power to set policy related to all GPI indicators. However, state and local governments in the U.S. do have important policymaking powers in regards to land use and planning, energy use, and other relevant GPI indicators.

While GPI includes a similarly broad range of indicators as existing urban indicators, its ability to aggregate these values using a common currency can better enable comparisons within or between regions or over time. Past urban indicators literature has noted that social and environmental indicators cannot share a common currency, such as dollars (Maclaren, 1996). However, increasing sophistication of nonmarket economic valuation techniques and a growing library of nonmarket valuation studies that quantify these costs and benefits are increasingly improving the accuracy of such measurements, enabling the use of a common currency for measures like the GPI. At the same time, individual GPI indicators can be clearly "unbundled" – that is, viewed and

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