



### Shouldn't we be **OPTIMIZING** the size of the economy rather than **MAXIMIZING** it?

*The scientific evidence is irrefutable and unsettling. The world economy, which grew 24 times bigger between 1900 and 2005, is straining the earth's ecosystems and the societies they support in unprecedented and potentially disastrous ways. This growth cannot continue. We need new economic policies that ensure the economy does not overshoot the capacity of ecosystems to sustain it.*

Most economists envision the economy as a self-contained system. If they include nature in their equations at all, it is usually in the context of exploiting natural resources as economic inputs. This worldview disregards the fact that the economy is part of a larger whole: the biosphere. Recognition of this fact is the first step toward sustainable scale, toward trying to *optimize* the size of the economy rather than *maximize* it.

#### Science or Science Fiction?

The earth is a closed system. Solar energy flows in, and heat flows out, but matter is constant (except for an occasional incoming meteor or outgoing satellite). In a closed

system, there is a limit to how much growth can take place. Importing materials from (and exporting wastes to) outer space will at some point become the only way growth can continue.

#### From an Empty to a Full World

For most of history the bounty of nature seemed endless, and it could be taken for granted. With moderate numbers of people using relatively primitive technologies, the planet was practically impervious to harm from economic activities. Although people could overfish an individual pond, there were so many more unfished ponds that there was no reason to worry. Current economic theories and institutions took

### Which path is likely to lead to a better outcome?

- A) Clinging to asteroid mining schemes and risking the viability of our planet on dreams of interplanetary trade.
- B) Recognizing and accepting the limits to growth and re-envisioning our economy to meet our needs without overburdening planetary systems.

#### A) The Video Game Approach

Asteroids will provide the ingredients to keep up growing—never mind that we have supreme difficulties with “high-tech” tasks like capping a leaking oil well in the Gulf of Mexico.



#### B) The Sane Approach

We acknowledge the limits to growth and live well within our means. We maintain an economic scale that meets our needs and leaves safe operating space for planetary systems.

shape under these conditions, that is, in a world relatively empty of people and manufactured goods.

This situation has changed drastically. Rapid increases in population, resource use, and technological capabilities over the past few centuries have massively expanded the global impacts of economic activities. According to the Global Footprint Network, this impact (our collective ecological footprint) has grown too big. We are using resources faster than they can be regenerated and producing wastes faster than they can be assimilated. Johan Rockström and his colleagues have identified the degree to which the economy is placing an excessive burden on the biosphere. They have analyzed nine “planetary boundaries,” each of which defines the safe operating space for humanity on the planet. For three of these boundaries (climate change, biodiversity loss, and the nitrogen cycle), humanity is now exceeding the planet’s safe operating space, and by a large margin in terms of biodiversity and nitrogen.

### **Economic vs. Uneconomic Growth**

Long before the economy threatens the resilience of ecosystems, economic growth can become undesirable. Much growth (i.e., increasing GDP) consists of “defensive expenditures,” products and services that counteract the negative consequences of other economic activities. An example of a defensive expenditure is the treatment of cancer caused by industrial pollution.

Even assuming a product causes no direct harm to users, its production inevitably

contributes to the depletion of natural resources. The trade-off between products and natural resources may be worthwhile when the economy is small, but as it grows, the additional products become increasingly costly. Throughout much of human history people have become better off by producing and consuming more. In high-consuming countries today, however, the costs of increased production often outweigh the benefits. Further growth is now *uneconomic*.

### **Reaching Optimal Scale**

Management of the economy in a full world and avoidance of uneconomic growth urgently require a transition to a steady state economy of optimal scale. We need to understand the real relationship between the economy and its containing ecosystems. But finding the Goldilocks scale of the economy—the size that’s not too small, and not too large, but just right—is no easy feat.

In cases where the benefits of growth outweigh the costs (for example, where excess ecological capacity exists and people are not consuming enough to meet their needs), growth is warranted prior to establishing a steady state economy. In cases where the economy has overshootecological bounds, degrowth is necessary before stabilization. Businesses, governments, and citizens will need to adjust the scale of the economy through accurate measurement of benefits and costs, trial and error, regulation of markets, and political will. This task of homing in on optimal scale is a critical challenge of our time, and the key to reaching a viable future.

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