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Julian Simon was right: A half-century of population growth, increasing prosperity, and falling commodity prices

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Many people believe that global population growth leads to greater poverty and more famines, but evidence suggests otherwise. Between 1960 and 2016, the world's population increased by 145 percent. Over the same time period, real average annual per capita income in the world rose by 183 percent.

Instead of a rise in poverty rates, the world saw the greatest poverty reduction in human history. In 1981, the World Bank estimated, 42.2 percent of humanity lived on less than \$1.90 per person per day (adjusted for purchasing power). In 2013, that figure stood at 10.7 percent. That's a reduction of 75 percent. According to the Bank's more recent estimates, absolute poverty fell to less than 10 percent in 2015.

Rising incomes helped lower the infant mortality rate from 64.8 per 1,000 live births in 1990 to 30.5 in 2016. That's a 53 percent reduction. Over the same time period, the mortality rate for children under five years of age declined from 93.4 per 1,000 to 40.8. That's a reduction of 56 percent. The number of maternal deaths declined from 532,000 in 1990 to 303,000 in 2015 — a 43 percent decrease.

Famine has all but disappeared outside of war zones. In 1961, food supply in 54 out of 183 countries was less than 2,000 calories per person per day. That was true of only two countries in 2013. In 1960, average life expectancy in the world was 52.6 years. In 2015, it was 71.9 years — a 37 percent increase.

In 1960, American workers worked, on average, 1,930 hours per year. In 2017, they worked 1,758 hours per year — a reduction of 9 percent. The data for the world are patchy. That said, a personal calculation based on the available data for 31 rich and middle-income countries suggests a 14 percent decline in hours worked per worker per year.

Enrollment at all education levels is up. For example, the primary school completion rate rose from 74 percent in 1970 to 90 percent in 2015 — a 20 percent increase. The lower secondary school completion rate rose from 53 percent in 1986 to 77 percent in 2015 — a 45 percent

increase. Tertiary school enrollment rose from 10 percent in 1970 to 36 percent in 2015 — a 260 percent increase.

Even our air is getting cleaner. In the United States, for example, aggregate emissions of six common pollutants (i.e., carbon monoxide, lead, nitrogen dioxide, ozone, fine and coarse particulate matter, and sulfur dioxide) fell by 67 percent between 1980 and 2016.

And, in spite of a recent increase in terrorist killings and the number of civil wars, the world is still much safer than it was at the height of the Cold War. Last but not least, an ordinary person has greater access to information than ever before. All in all, we live on a safer, cleaner, and more prosperous planet than was the case in 1960.

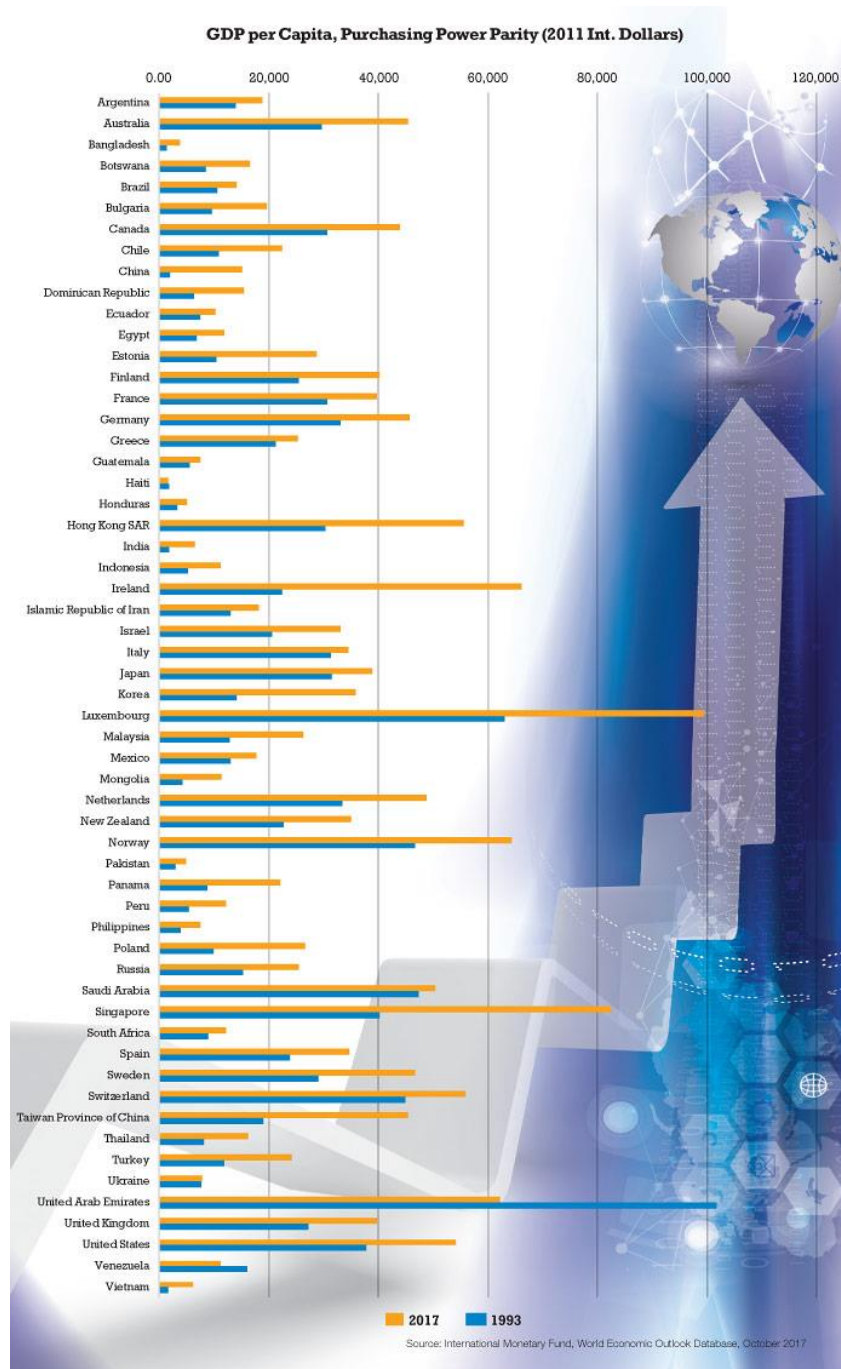
How can one explain this unprecedented improvement in global well-being? Some of it must be attributed to technological and scientific progress. Also, specialization and trade played a vital role in improving the state of the world. Globalization ensured that an increase in the world's population translated to an increase in the world's productivity.

Of course, growth required the use of massive amounts of natural resources. How much of our natural wealth remains? Although we do not know the size of most reserves of natural resources, we can ascertain their scarcity or abundance by looking at prices. As this paper shows, after 56 years of human use and exploration, the vast majority of the commodities tracked by the World Bank are cheaper than they used to be — either absolutely or relative to income.

These findings would come as no surprise to the late Julian Simon (1932-1998), who years ago explained and predicted the happy confluence of growing population, increasing wealth, and falling commodity prices. In his 1981 book “The Ultimate Resource,” Simon noted that humans are intelligent animals who innovate their way out of scarcity through greater efficiency, increased supply, or development of substitutes. Human ingenuity, in other words, is “the ultimate resource” that makes other resources more plentiful.

An aluminum can, for example, weighed about 3 ounces in 1959. Today, it weighs less than half an ounce. In other cases, we have replaced scarce resources with those that are more plentiful. Instead of killing whales for lamp oil, for instance, we burn coal, oil and gas. In fact, humanity is yet to run out of a single nonrenewable resource.

Although past performance does not guarantee future results, constant predictions of doom and gloom should be put in perspective. Humanity has solved many challenges in the past, and there is no reason to believe that we will not be able to solve problems in the future. Put differently, there is no compelling evidence to support calls for mandatory curbs on human reproduction and consumption.



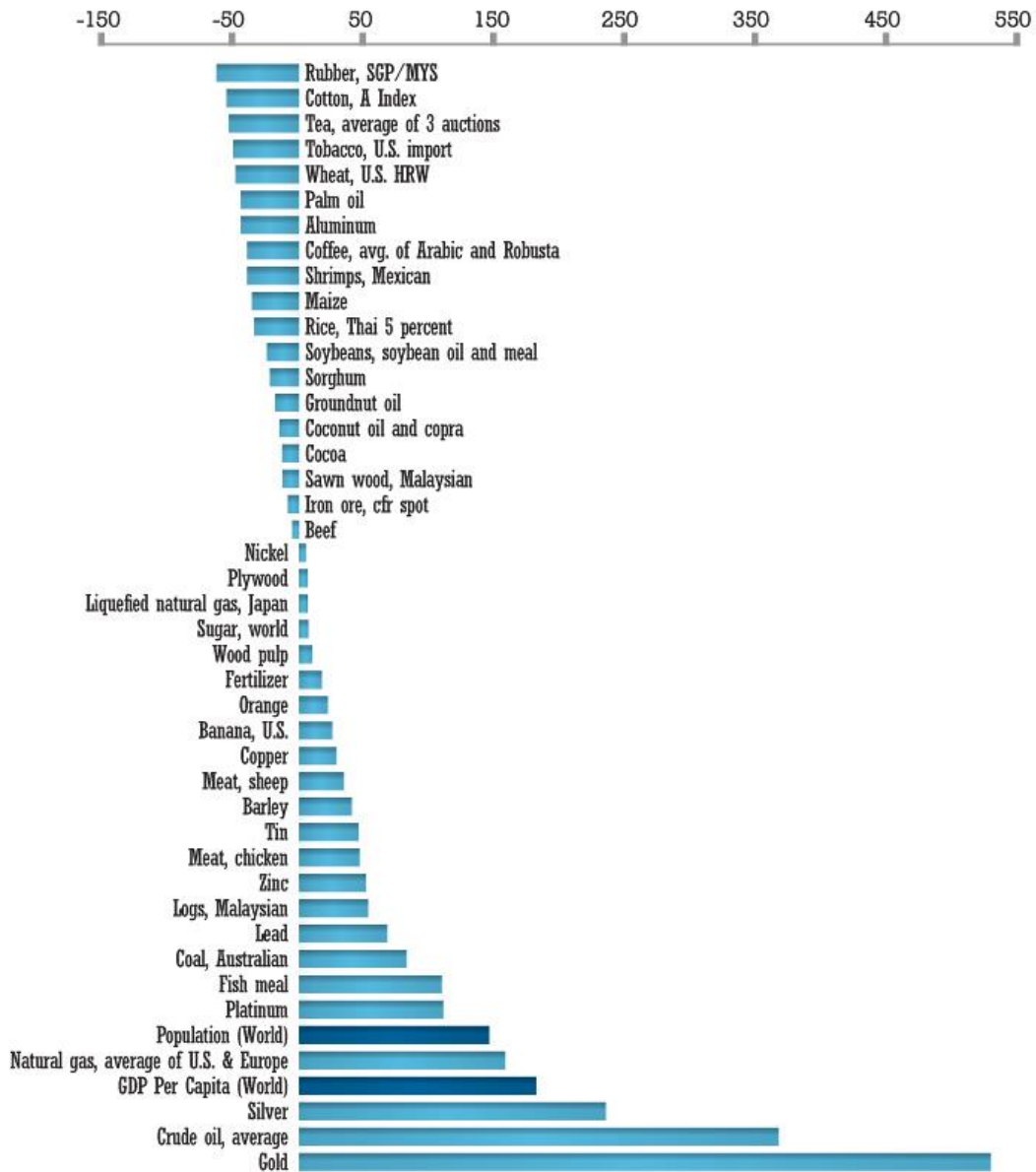
The report by Marian Tupy in this issue describes how the world is getting better and global poverty has greatly diminished. This table shows the rise in real per capita incomes for most major countries over the past quarter century, which for the most part is a remarkable success story.

Findings

Between 1960 and 2016, world population increased by 145 percent and average income per capita adjusted for inflation increased by 183 percent. Out of the 42 distinct commodity prices

measured by the World Bank, 19 have declined in absolute terms. In other words, adjusted for inflation, those commodities were cheaper in 2016 than in 1960. Twenty-three commodities have increased in price over the past 56 years. However, of those 23 commodities, only three (crude oil, gold, and silver) appreciated more than income. In a vast majority of cases, therefore, commodities became cheaper either absolutely or relatively.

Commodity Prices, Population and Income, Percent Change, 1960-2016



Simon’s wisdom in historical perspective

It is often posited that population growth must inevitably result in the exhaustion of natural resources, environmental destruction, and even mass starvation. Take, for example, the report “The Limits to Growth,” which was published by the Club of Rome in 1972. The report, which

was based on Massachusetts Institute of Technology computer projections, looked at the interplay between industrial development, population growth, malnutrition, the availability of nonrenewable resources, and the quality of the environment. It concluded that “If present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. . . . The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity. . . . Given present resource consumption rates and the projected increase in these rates, the great majority of currently nonrenewable resources will be extremely expensive 100 years from now.”

That kind of alarmism is not ancient history. A recent article in the journal *Nature Sustainability* argued:

“Humanity faces the challenge of how to achieve a high quality of life for over 7 billion people without destabilizing critical planetary processes. Using indicators designed to measure a ‘safe and just’ development space, we quantify the resource use associated with meeting basic human needs, and compare this to downscaled planetary boundaries for over 150 nations. We find that no country meets basic needs for its citizens at a globally sustainable level of resource use. Physical needs such as nutrition, sanitation, access to electricity and the elimination of extreme poverty could likely be met for all people without transgressing planetary boundaries. However, the universal achievement of more qualitative goals (for example, high life satisfaction) would require a level of resource use that is 2-6 times the sustainable level, based on current relationships. . . . [O]ur findings suggest that the pursuit of universal human development . . . has the potential to undermine the Earth-system processes upon which development ultimately depends [I]f all people are to lead a good life within planetary boundaries, then the level of resource use associated with meeting basic needs must be dramatically reduced.”

The above arguments are strikingly similar to those made in *The Limits to Growth* report 46 years ago. Yet none of the dire predictions made by the authors of the latter publication have come to pass. On the contrary, we have seen an overall decline of commodity prices relative to income — in spite of a growing global population. Can this happy trend continue? To get a glimpse of the future, we must first understand the concept of scarcity.

Scarcity, or “the gap between limited – that is, scarce – resources and theoretically limitless wants,” is best ascertained by looking at prices. A scarce commodity goes up in price, whereas a plentiful commodity becomes cheaper. That was the premise of a famous bet between Stanford University professor Paul Ehrlich and University of Maryland professor Julian Simon. Ehrlich shared the gloomy predictions of the Club of Rome. In his best-selling 1968 book, “*The Population Bomb*,” Ehrlich reasoned that overpopulation would lead to exhaustion of natural resources and mega-famines. “The battle to feed all of humanity is over. In the 1970s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now. At this late date nothing can prevent a substantial increase in the world death rate,” he wrote.

Simon, in contrast, was much more optimistic. In his 1981 book “*The Ultimate Resource*,” Simon used empirical data to show that humanity has always gotten around the problem of

scarcity by increasing the supply of natural resources or developing substitutes for overused resources. Human ingenuity, he argued, was “the ultimate resource” that would make all other resources more plentiful. In 1980, the two thinkers agreed to put their ideas to a test.

As Ronald Bailey wrote in his 2015 book “The End of Doom: Environmental Renewal in the 21st Century”:

“In October 1980, Ehrlich and Simon drew up a futures contract obligating Simon to sell Ehrlich the same quantities that could be purchased for \$1,000 of five metals (copper, chromium, nickel, tin, and tungsten) ten years later at inflation-adjusted 1980 prices. If the combined prices rose above \$1,000, Simon would pay the difference. If they fell below \$1,000, Ehrlich would pay Simon the difference. Ehrlich mailed Simon a check for \$576.07 in October 1990. There was no note in the letter. The price of the basket of metals chosen by Ehrlich and his cohorts had fallen by more than 50 percent. The cornucopian Simon won.”

Simon’s critics, Ehrlich included, have since argued that Simon got lucky. Had his bet with Ehrlich taken place over a different decade, the outcome might have been different. Between 2001 and 2008, for example, the world had experienced an unprecedented economic expansion that dramatically increased the price of commodities. But Simon’s larger point concerning the long-term decline in the price of commodities still stands. According to Simon, when a particular resource becomes scarcer, its price increases, and that change incentivizes people to discover more of the resource (like oil fracking), ration it, recycle it, or develop a substitute for it. As such, population growth and resource use do not automatically lead to higher commodity prices in the long run.

In fact, humanity has yet to run out of a single nonrenewable resource. Unfortunately, many people still believe that the answer to scarcity is to limit consumption of natural resources. This group includes Paul Ehrlich and his wife, Anne, who revisited the Stanford University professor’s dire warnings in a 2013 Proceedings of the Royal Society article titled “Can a Collapse of Global Civilization Be Avoided?” Undeterred by a half-century of evidence to the contrary, they came to conclusions similar to those that Paul Ehrlich had originally proposed in the 1960s. The Club of Rome is still around and publishing. In 2017, it published a new report titled *Come On! Capitalism, Short-termism, Population and the Destruction of the Planet*, which insisted that “the Club of Rome’s warnings published in the book *Limits to Growth* are still valid” and warned that the “current worldwide trends are not sustainable.”

To these warnings about humanity’s future, a veritable smorgasbord of similar publications may be added. They include Naomi Klein’s 2015 book “*This Changes Everything: Capitalism vs. The Climate*,” in which the Canadian author argues that “our economy is at war with many forms of life on earth, including human life. What the climate needs in order to avoid collapse is a contraction in humanity’s use of resources,” and Rob Dietz and Dan O’Neill’s 2013 offering, “*Enough Is Enough: Building a Sustainable Economy in a World of Finite Resources*.” According to the American and Canadian economists, “We’re overusing the earth’s finite resources, and yet excessive consumption is failing to improve our lives.”

But consumption limits are unpopular and difficult to enforce. More often than not, their effects fall hardest on the most vulnerable. A switch from fossil fuels to “renewable” sources of energy, for example, has increased the price of gas and electricity in many European countries to such an extent that a new term, energy poverty, was coined. According to the German magazine *Der Spiegel*, “Germany’s aggressive and reckless expansion of wind and solar power has come with a hefty price tag for consumers, and the costs often fall disproportionately on the poor.” In democracies, such policies are, in the long run, unsustainable.

More important, they are unnecessary, because real solutions to future scarcity are more likely to come from innovation and technological change.

The discussion in this paper is not meant to trivialize the challenges that humanity faces or imply that we will be able to solve all of the problems ahead. Instead, it is meant to show that the human brain, the ultimate resource, is capable of solving complex challenges. We have been doing so with disease, hunger, and extreme poverty, and we can do so with respect to the use of natural resources.

Thomas Babington Macaulay, a 19th-century British historian and politician, once asked, “On what principle is it that when we see nothing but improvement behind us, we are to expect nothing but deterioration before us?” In 1830, when Macaulay penned those words, the world was just beginning to industrialize. One hundred eighty-eight years later, humanity is not only still here, but it is flourishing like never before. Few people today would forgo the life expectancy, nutrition, health care, and education they now enjoy in exchange for those experienced by Macaulay’s contemporaries.

This article is drawn from my Feb. 16, 2018, Cato Institute paper, which may be obtained in its entirety at <https://www.cato.org/publications/economic-development-bulletin/julian-simon-was-right-half-century-population-growth>

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