

Julian Simon's Bet With Paul Ehrlich

By [Brian Carnell](#)

In 1980, economist [Julian Simon] and biologist [Paul Ehrlich](#) decided to put their money where their predictions were. Ehrlich had been predicting massive shortages in various natural resources for decades, while Simon claimed natural resources were infinite.

Simon offered Ehrlich a bet centered on the market price of metals. Ehrlich would pick a quantity of any five metals he liked worth \$1,000 in 1980. If the 1990 price of the metals, after adjusting for inflation, was more than \$1,000 (i.e. the metals became more scarce), Ehrlich would win. If, however, the value of the metals after inflation was less than \$1,000 (i.e. the metals became less scarce), Simon would win. The loser would mail the winner a check for the change in price.

Ehrlich agreed to the bet, and chose copper, chrome, nickel, tin and tungsten.

By 1990, all five metal were below their inflation-adjusted price level in 1980. Ehrlich lost the bet and sent Simon a check for \$576.07. Prices of the metals chosen by Ehrlich fell so much that Simon would have won the bet even if the prices hadn't been adjusted for inflation. **(1)** Here's how each of the metals performed from 1980-1990.

Metal (2)	1980 price (1980 dollars)	1990 price (1980 dollars)	Percentage change
Copper (195.56 lbs.)	\$200	\$163	-18.5%
Chrome (51.28 lbs.)	\$200	\$120	-40%
Nickel (63.52 lbs.)	\$200	\$193	-3.5%
Tin (229.1 lbs.)	\$200	\$56	-72%
Tungsten (13.64 lbs.)	\$200	\$86	-57%

Ehrlich's reaction to the outcome was typical of his habit of ignoring his failed predictions in general. Ehrlich maintained he really didn't want to make the bet, and regardless that the outcome was meaningless:

Paul [Ehrlich] and other scientists knew that the five metals in the proposed wagers were not critical indicators and said so at the time ... Nonetheless, after consulting with many colleagues, Paul ... accepted Simon's challenge ... rather than listen to him

charge that environmental scientists were unwilling to put their money where their mouths were. **(3)**

Unfortunately this claim doesn't match the record very well. First, Simon got the inspiration to offer the bet from Ehrlich who famously wrote that "If I were a gambler, I would take even money that England will not exist in the year 2000." **(4)** The many people who have taken Simon to task for assigning too much importance to his bet with Ehrlich seem to ignore Ehrlich's penchant for such wild statements.

More importantly in the 1980s Ehrlich not only thought his bet was easy money but thought Simon to be dead wrong in thinking metal prices would go anywhere but upward:

Simon is wrong about the economics of mineral resources ... The trough-like pattern long predicted for mineral resources prices has now shown up, as Cook (1976) points out, for all industrial metals except lead and aluminum. This includes copper. ...

I and my colleagues, John P. Holdren ... and John Harte ... jointly accept Simon's astonishing offer before other greedy people jump in. **(5)**

Ehrlich hardly sounded like a man taking Simon's bet just to make him shut up.

Similarly Ehrlich recently claimed the prices of the metals fell not due to declining scarcity, but "in part because a recession in the first half of that decade [the 1990s] slowed the growth of demand for industrial metals worldwide". **(6)** There were in fact a number of reasons for the decline in metal prices in the 1980s.

The decline in tin prices was staggering, for example, but is explained by the fact that in 1980 most of the world's tin production was controlled by a cartel which artificially kept prices inflated. The cartel fell apart in the 1980s and the price of tin crashed. The complaint that the bet doesn't prove much because use of metals declined makes Simon's point. As *New York Times Magazine* writer John Tierney summed up changes in the use of metals in the 1980s:

Prices fell for the same Cornucopian reasons they had fallen in previous decades -- entrepreneurship and continuing technological improvements. Prospectors found new lodes such as the nickel mines around the world that ended a Canadian company's near monopoly of the market. Thanks to computers, new machines and new chemical processes, there were more efficient ways to extract and refine the ores for chrome and the other metals. For many uses, the metals were replaced by cheaper materials, notably plastics, which became less expensive ... Telephone calls went through satellites and fiber-optic lines instead of copper wires. Ceramics replaced tungsten in cutting tools. Cans were made of aluminum instead of tin... **(7)**

As Ehrlich told Tierney, however, he believes there's no lesson to be learned from his bet with Simon:

The bet doesn't mean anything. Julian Simon is like the guy who jumps off the Empire State Building and says how great things are going so far as he passes the 10th floor. I think the price of those metals will go up eventually. **(8)**

For Ehrlich if his predictions come true, they prove he's right and if they don't come true they still prove he's right -- or he takes credit himself for averting the predicted disaster.

Both Simon and Ehrlich offered new criteria for a second bet, but were unable to agree on any terms before Simon's death in 1997. Simon originally offered to repeat the original bet, but

Ehrlich -- despite his insistence that "those metals will go up eventually" -- declined.

In *The Ultimate Resource 2*, Simon offered this blanket wager offer:

I'll bet that just about any environmental and economic trend pertaining to basic human material welfare (though not, of course, the progress of this group compared to that one) will show improvement in the long run. (9)

For their part Paul Ehrlich and Steven Schneider offered a series of 15 items "pertaining to material human welfare" they were willing to bet would worsen over the next decade. Simon declined to accept the wager. The criteria included:

- The three years 2002-2004 will on average be warmer than 1992-1994. (Rapid climate change associated with global warming could pose a major threat of increasing droughts and floods).
- There will be more carbon dioxide in the atmosphere in 2004 than in 1994. (Carbon dioxide is the most important greenhouse gas driving global warming).
- There will be more nitrous oxide in the atmosphere in 2004 than 1994. (Nitrous oxide is another greenhouse gas that is increasing due to human disruption of the nitrogen cycle).
- The concentration of ozone in the lower atmosphere (the troposphere) will be greater than in 1994. (Tropospheric ozone is a component of smog that has important deleterious effects on human health and crop production).
- Emissions of the air pollutant sulfur dioxide in Asia will be significantly greater in 2004 than in 1994. (Sulfur dioxide in the atmosphere becomes sulfuric acid, the principal component of acid rain, and it is associated with direct damage to human health, forests, and crops.)
- There will be less fertile cropland per person in 2004 than in 1994. (Much of Earth's best farmland is paved over, but even if it weren't, population will reduce per-capita acreage).
- There will be less agricultural soil per person in 2004 than 1994. (Erosion virtually everywhere far exceeds rates of soil generation).
- There will be on average less rice and wheat grown per person in 2002-2004 than in 1992-1994. (Rice and wheat are the two most important crops consumed by people).
- In developing nations there will be less firewood available per person in 2004 than in 1994. (More than a billion people today depend on fuelwood to meet their energy needs).
- The remaining area of virgin tropical moist forests will be significantly smaller in 2004 than in 1994. (Those forests are the repositories of some of humanity's most precious living resources, including the basis for many modern pharmaceuticals worldwide).
- The oceanic fisheries harvest per person will continue its downward trend and thus in 2004 will be smaller than in 1994. (Overfishing, ocean pollution, and coastal wetlands will continue to take their toll.)
- There will be fewer plant and animal species still extant in 2004 than in 1994. (Other organisms are the working parts of humanity's life-support systems).
- More people will die of AIDS in 2004 than in 1994 (as the disease takes its toll of already infected individuals, continues to spread in Africa, and takes off in Asia).
- Between 1994 and 2004, sperm counts of human males will continue to decline and reproductive disorders will continue to increase. (Over the past fifty years, sperm counts worldwide may have declined by as much as 40 percent. Paul and Steve bet this trend will continue due to the widespread use and environmental persistence of hormone-disrupting synthetic organic chemical compounds).

- The gap in wealth between the richest 10% of humanity and the poorest 10% will be greater in 2004 than in 1994. **(10)**

The items offered by Ehrlich and Schneider dramatically highlight the different approach between them and Simon. The first five items, for example, don't even pretend to measure human welfare. Simon wants to bet on things like human life expectancy, while Ehrlich and Schneider respond that they want to bet on the composition of the atmosphere.

Some of their suggestion are even odder. The proposed bet on income inequality, for example, seems strange. Income inequality between the top 10 percent and the bottom 10% will be much higher on Jan. 1, 2000 than it was on Jan. 1, 1900, yet by every measure the bottom 10% is much better off today than 100 years ago. Ehrlich and Schneider apparently believe this improvement is not as important as achieving more equal income distribution.

Similarly the claim that sperm counts have declined worldwide is specious and relies on data that is highly controversial. Recent studies claiming that sperm rates in the United States had declined were found to be flawed because they were comparing different geographical regions and, for reasons still unknown, sperm counts vary by region (contrary to what one would expect if Ehrlich's fear of chemicals were accurate, sperm counts are actually higher in urban areas than in rural areas in the United States).

Simon illustrated the difference with an analogy involving the Olympics,

Let me characterize their [Ehrlich and Schneider's] offer as follows. I predict, and this is for real, that the average performances in the next Olympics will be better than those in the last Olympics. On average, the performances have gotten better, Olympics to Olympics, for a variety of reasons. What Ehrlich and others says is that they don't want to bet on athletic performances, they want to bet on the conditions of the track, or the weather, or the officials, or any other such indirect measure. **(11)**

Simon said he was willing to bet on the items in Ehrlich and Schneider's proposal that directly measures human welfare -- such as the per capita rice and wheat crops -- but that Ehrlich and Schneider insisted on betting on all fifteen propositions as a package deal. **(12)**

Footnotes:

1. Bast, Joseph L.; Hill, Peter J.; and Rue, Richard C. Eco-sanity: a common-sense guide to environmentalism. Laham, Maryland: Madison Books, 1994, p.124.
2. Tierney, John. "Betting the planet." New York Times Magazine, Dec. 2, 1990, p.81.
3. Ehrlich, Paul R. and Ehrlich, Anne H. Betrayal of science and reason: how anti-environmental rhetoric threatens our future. Washington, DC: Island Press, 1996, pp.100-1.
4. Simon, Julian. The ultimate resource. New Jersey: Princeton University Press, 1981, p.27.
5. Ehrlich, Paul R. "An economist in wonderland." Social Science Quarterly, vol. 62, no. 1, March 1981, p.46.
6. Ehrlich, Paul R. and Ehrlich, Anne H. Betrayal of science and reason: how anti-environmental rhetoric threatens our future. Washington, DC: Island Press, 1996, p.101.
7. Tierney, John. "Betting the planet." New York Times Magazine, Dec. 2, 1990, p.81.

8. Tierney, John. "Betting the planet." New York Times Magazine, Dec. 2, 1990, p.81.
9. Simon, Julian. The ultimate resource 2. Princeton, New Jersey: Princeton University Press, 1996, p.36.
10. Ehrlich, Paul R. and Ehrlich, Anne H. Betrayal of science and reason: how anti-environmental rhetoric threatens our future. Washington, DC: Island Press, 1996, pp.101-3.
11. Miele, Frank. "Living without limits: an interview with Julian Simon." Skeptic, vol. 5, no. 1, 1997, p.57.
12. Miele, Frank. "Living without limits: an interview with Julian Simon." Skeptic, vol. 5, no. 1, 1997, p.57.

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