

A 40th Anniversary Redux of the Simon and Ehrlich Bet

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This is the authors third redux of the now famous Simon and Ehrlich wager on the value of a basket of metals based upon scarcity and demand; this paper falls on the 40th anniversary of the controversial bet. The first two papers faithfully replicated the original bet explored the underlying arguments of Malthus and scarcity and the more Cornucopian view based on human ingenuity and inventiveness. In this paper we faithfully replicate the original bet and update it from 1980 to 2019 and then we add consumption weight as an additional variable which goes directly to demand of the metals. Simon offered in his book *The Ultimate Resource* and optimistic view of how human ingenuity has always risen to solving the resource issues that mankind faces and yes, even creates. Ehrlich's pessimistic view presented in *The Population Time Bomb* has not come to fruition; developing economies have adopted free market capitalism and democracy and a global middle class is growing like it never has before.

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Introduction

The past 40 years we have witnessed the most dramatic growth in middle class and consumer societies in the history of the world.

Something of enormous global significance is happening almost without notice. For the first time since agriculture-based civilization began 10,000 years ago, the majority of humankind is no longer poor or vulnerable to falling into poverty. By our calculations, as of this month, just over 50 percent of the world's population, or some 3.8 billion people, live in households with enough discretionary expenditure to be considered "middle class" or "rich." (Kharas & Hamel, 2018)

If as Malthus and Ehrlich believe that resources are finite and that scarcity with rising demand leads to rising prices for basket of metals, comprising the bet would be the logical and predictable outcome. This paper seeks to answer that question.

The passage below from Paul Ehrlich's best-selling novel *The Population Time Bomb* is emblematic or perhaps symptomatic of the core values of political environmentalism rooted in a belief that humanity is not part of nature rather it is an infliction or infestation on the planet. My reaction to this quote led me to search for a more optimistic view of humanity and Julian Simon offered the antidote to the pessimism and pseudo-science of political environmentalism.

The streets seemed alive with people. People eating, people washing, people sleeping. People visiting, arguing, and screaming. People thrusting their hands through the taxi window, begging. People defecating and urinating. People

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clinging to buses. People herding animals. People, people, people, people. As we moved slowly through the mob, hand horn squawking, the dust, noise, heat and cooking fires gave the scene a hellish aspect. Would we ever get to our hotel? All three of us were, frankly, frightened... since that night I've known the feel of overpopulation. (Ehrlich, 1967)

Julian Simon's best-selling book *The Ultimate Resource* provides the alternative view of people and humanity and it celebrates their ambitions, drive, and ingenuity in the pursuit of improving their station in life. Simon also celebrates the most powerful economic philosophy ever conceived Adam Smith's 18th century free market capitalism treatise in *The Wealth of Nations*. Simon would reject the characterization that he is a Cornucopian but rather would likely have defined himself as an optimistic realist—having witnessed humanities rising quality of life throughout the 20th century and into the 21st century.

The ultimate resource is people—especially skilled, spirited, and hopeful young people endowed with liberty—who will exert their wills and imaginations for their own benefit and inevitably benefit the rest of us as well. The material conditions of life will continue to get better for most people, in most countries, most of the time, indefinitely. Within a century or two, all nations and most of humanity will at or above today's Western living standards. (Simon, 2021)

Political environmentalism has found a natural ally in western democratic socialism both subscribing to the need to control people, government, and economies and saw the conditions of the world worsening and Simon predicted this with the following quote. "I also speculate, however, that many people will continue to think and say that the conditions of life are getting worse" (Simon, 2021).

Simon inherently questioned scientific absolutism and must have cringed at estimates of natural resources that predicted that we are depletion of oil in 100 years and or any other prognostication of the finite nature of resources. He would likely smile at the ingenuity of fracking that has made the United States an oil and natural gas exporter and the world's energy leader and cringe at the edict that climate change is settled science. In a previous paper we addressed the nature of "finitism" and found that it was not confined to natural resources but some social theorists had extended it to new ideas and invention and that humanity was running out of ideas. Simon's thesis is based on human ingenuity and inventiveness in solving the problems that humanity encounters; so for his critics, if ideas are finite then we can run out of those as well. We employed new patent rate filings as a proxy for new ideas and found that in fact patent rates accelerated throughout the 20th century and into the 21st century. The idea that we are going to run out of ideas is also challenged by the fact that growing middle class economies across the globe like India and China are going to offer untapped talent and ideas from their populations.

In 2018, a new variation on Simon/Ehrlich index was created utilizing 50 commodities and named the Simon Abundance Index by authors Pooley and Tupy.

The widely-followed contest originated in the pages of *Social Science Quarterly*, where Simon challenged Ehrlich to put his money where his mouth was. In response to Ehrlich's published claim that "If I were a gambler, I would take even money that England will not exist in the year 2000", Simon offered to take that bet, or, more realistically, "to stake US\$10,000 ... on my belief that the cost of non-government-controlled raw materials (including grain and oil) will not rise in the long run" (Goklany, 2007).

Simon challenged Ehrlich to choose any raw material he wanted and a date more than a year away, and he would wager on the inflation-adjusted prices decreasing as opposed to increasing. Ehrlich chose copper, chromium, nickel, tin, and tungsten. The bet was formalized on September 29, 1980, with September 29, 1990, as the payoff date. Ehrlich lost the bet, as all five commodities that were bet on declined in price from 1980

through 1990, the wager period.

Economist Mark J. Perry noted that for an even longer period of time, from 1934 to 2013, the inflation-adjusted price of the Dow Jones-AIG Commodities Index showed “an overall significant downward trend” and concluded that Simon was “more right than lucky”. Economist Tim Worstall wrote that “The end result of all of this is that yes, it is true that Ehrlich could have, would have, won the bet depending upon the starting date” (Wikipedia, 2021).

Which leaves me trying to point out that Simon really was correct: it’s just the timescale that can be a bit dodgy. We do discover new mineral resources, we do develop new extraction technologies, which make larger amounts of mineral resources available to us. There are other events that happen, certainly, which push prices up for periods of time. But the long term trend for metals at least is downwards. (Worstall, 2013)

Even as middle class consumer societies increase dramatically across the globe Simon’s belief in the ingenuity of humankind and sourcing for alternatives would result in the price of commodities falling as they have over the last forty years. “By our calculations, the middle-class markets in China and India in 2030 will account for \$14.1 trillion and \$12.3 trillion, respectively, comparable in size to a U.S. middle-class market at that time of \$15.9 trillion” (Kharas & Hamel, 2018). As we watch middle class and consumer societies develop in both China and India and other nations of the world, we would expect spiking demand and scarcity to drive the basket of goods in the Simon and Ehrlich bet higher, but will that be the case.

Update in the Simon and Ehrlich’s Original Bet

The following table shows the five metals’ prices in 1980, 2005, and 2019.

Table 1

Commodity Price in 1980, 2005, and 2019 (US Dollars/lb)

Commodity	Price in 1980	Price in March 2005	Price in 2019
Chrome	3.90	0.75	1.02*
Copper	1.02	1.53	2.59
Nickel	3.15	7.34	7.14
Tin	0.87	3.82	7.53
Tungsten	14.66	7.25	17.15*

Note. *Chrome and Tungsten’s prices in 2019 are not available since they are currently not traded publicly. We use the prices in 2015 as the proxy.

Next, we adjusted the original prices for inflation.

Table 2

Commodity Price in 1980, 2005, and 2019 (1980 US dollars/lb)

Commodity	Price in 1980	Price in 2005	Price in 2019
Chrome	3.90	0.32	0.33
Copper	1.02	0.65	0.83
Nickel	3.15	3.10	2.29
Tin	0.87	1.61	2.41
Tungsten	14.66	3.06	5.49

Removing the inflation effect, the five metals’ unit prices changed much more modestly than shown in Table 1. For instance, nickel inflation-adjusted price per pound remained similar in 2005 to that in 1980 and

slightly declined in 2019, whereas Table 1 shows that nickel price rose as much as twice from 1980 to 2005.

In the original Simon and Ehrlich bet, they spent \$200 on each metal in 1980, and bought the same amount of each metal in 1990. This indicates the weighting of their basket as follows:

Table 3

Weight of Each Metal in the Original Basket

Commodity	Weight (lb)
Chrome	51.28
Copper	195.56
Nickel	63.52
Tin	229.1
Tungsten	13.64

Using the weights shown in Table 3, we multiply them with the inflation-adjusted prices from Table 2 to reach the inflation-adjusted value of the original basket for 2005 and 2019.

Table 4 shows how much each metal was worth in 1980, 2005, and 2019 which equals the inflation-adjusted price in that year multiplied by the same amount of each metal that Simon and Ehrlich purchased in 1980.

Table 4

Basket Value With the Original Weighting (1980 US Dollars)

Commodity	1980	2005	2019
Chrome	199.99	16.23	16.76
Copper	199.47	126.25	162.18
Nickel	200.09	196.72	145.22
Tin	199.32	369.27	552.39
Tungsten	199.96	41.73	74.89
Basket value	998.83	750.19	951.44

As Table 4 shows, Simon would win the bet in 2005 by about \$250, meaning the same basket of metals would cost us less money in 2005 than in 1980. However, the basket value went up substantially in 2019. Simon would still win the bet in 2019 with a smaller margin. The sharp increase in the basket value from 2005 to 2019 is due to a surge in the tin price. Tin cost \$.87/lb in 1980, giving Tin a big weight (229.1 lbs for \$200 in 1980) in the original basket. The price of tin climbed to \$2.41/lb in 2019, tripled from 1980, driving the value of tin in the basket from \$200 in 1980 to approximately \$552 in 2019. Other than tin, all the metals are worth less in 2019 than in 1980.

A New Weighting Method: Consumption Based

The original weighting of the basket that Simon and Ehrlich chose in 1980 was based on the five metals' prices. The less expensive, the more weight, and hence the more important. But the importance of each metal should be based on its consumption, not its price. In this section, we update the basket value with the new consumption based weighting method.

Due to the data availability at USGS for the metal consumptions, we can only update the result based on consumption levels up to 2015.

Table 5

Consumptions of the Five Metals in the Original Bet (Metric Tons)

Commodity	1980	2005	2015
Chrome	727,000	548,000	438,000
Copper	2,180,000	2,420,000	1,820,000
Nickel	187,000	233,000	210,000
Tin	64,600	54,700	40,200
Tungsten	9,940	11,700	15,000*
Total	3,168,540	3,267,400	2,523,200

Note. *Data are not available, estimated based on the last few years.

Based on the consumptions-weight, we update the inflation-adjusted basket value of the five metals. First, we calculate the consumption based weight for each metal (each metal's consumption dividend by the total consumption) for each year, and then we multiply the consumption-based weight with each metal's inflation-adjusted price to reach the average metal price for the basket. Lastly, we use 500 lbs as the proxy of the basket weight since Simon and Ehrlich spent \$1,000 in 1980 and purchased approximately 500 lbs of metals in total (see Table 3).

Table 6

Basket Value With the Weighting Based on Consumptions (1980 US Dollars)

Commodity	1980	2005	2015
Chrome	447.41	26.54	30.76
Copper	350.89	239.07	320.93
Nickel	92.95	110.43	77.34
Tin	8.87	13.49	20.95
Tungsten	22.99	5.48	17.70
Basket value	923.12	395.00	467.68

Table 6 shows that the basket value has gone down as time goes by. In 2005, the basket was worth about \$395, less than half of the value in 1980. The value rose slightly from 2005 to 2015, but it was still substantially lower than that in 1980. With this new weighting method, Simon would have still won the bet with the same conclusion that metals cost less now than decades ago.

Two things are wroth noticing in Table 6. First, we consume copper far more than the other metals (Table 5), and therefore copper accounts for more weight in calculating the basket value. Secondly, the large decline in the basket value in 2005 and 2015 from 1980 is mainly driven by chrome. Both chrome consumption and price had dropped substantially since 1980s.

Conclusion

The authors have examined and reexamined the outcome of the Ehrlich and Simon bet three times over the past 15 years with Simon winning the bet four times since 1980. The bet endures because it serves as a point of debate between Cornucopians and neo-Malthusians and despite losing the bet four times neo-Malthusians persist in their pursuit of radical green economic policies that inhibit economic growth and prosperity. Simon offered in his book *The Ultimate Resource* and optimistic view of how human ingenuity has always risen to solving the resource issues that mankind faces and yes, even creates. Ehrlich's pessimistic view presented in

The Population Time Bomb has not come to fruition; developing economies have adopted free market capitalism and democracy and a global middle class is growing like it never has before. In this third paper the authors arrive at the same conclusion that Simon wins the bet and that the future of the world has and will continue to move in a positive direction.

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