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A 25th Anniversary Redux of the Simon and Ehrlich Global Sustainability Wager

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Abstract

The purpose of this paper is to examine the global sustainability bet made between Julian Simon noted conservative economist and author of the book The Ultimate Resource and Paul Ehrlich noted environmentalist and author of the book The Population Time Bomb.

The paper replicates the bet using the same basket of metals and examines their changes from 1990 to 2005. The underlying premise of the "redux" is to see if global economic integration and rising middle class consumption in the developing world will alter the outcome. In the original bet Julian Simon won and Paul Ehrlich wrote a check for the basket of metals differential value of $567.07. So it will be interesting to see how the basket valuation changes after 25 years of significant global social and economic change. In the bet between Simon and Ehrlich the larger debate between Malthusians and Cornucopians plays out and the paper reflects upon this dialectic throughout the narrative. So regardless of the outcome an interesting story will emerge regarding global environmental sustainability and economic and environmental paradigms.

Keywords: Cornucopian, Malthusian, sustainability, globalization, middle class, metals

Introduction

The purpose of this paper is to examine the global sustainability bet made between Julian Simon noted conservative economist and author of the book The Ultimate Resource and Paul Ehrlich noted environmentalist and author of the book The Population Time Bomb.

> Simon offered Ehrlich a bet centered on the market price of a basket of metals. Ehrlich would pick a quantity of any five metals he liked worth $1000 in 1980. If the 1990 price of the metals, after adjusting for inflation, was worth more than $1000 (i.e. the metals became more scarce) Ehrlich would win. If, however, the value of the metals after inflation was less than $1000 (i.e. the metals became less scarce), Simon would win. The loser would mail the winner a check for the change in the price. By 1990 all five metals were below their inflation adjusted price level in 1980 and Ehrlich lost the bet and sent Simon a check for $567.07. (Overpopulation.Com)

It has now been 15 years since the bet concluded and given the significant economic, commercial, and social changes the world has experienced it would be interesting to revisit the premise of this bet. The intuitive position of this paper is that Ehrlich could indeed win the bet if the increased demand for consumer goods causes the price of these base and alloy metals to rise. Remember, in the 1980's globalization was more the pursuit of low cost manufacturing inputs (labor and raw materials) and thus the global pursuit of these inputs would indeed lower the price of the metals. The world's population exceeds 5 billion residents and the world's middle class consumer societies are growing significantly in China, India and other regions of the world. Now, that we can add increased consumer demand to the equation will the derivative value of this basket metals have increased or decreased. Regardless, of who wins the bet of this "*Redux"* an interesting story will emerge about global sustainability, environmentalism, economic development and will be considered in this paper.

The debate between Malthusians and Cornucopians has prompted the writings of numerous books and articles that philosophically, empirically and frequently histrionically consider the issue of man's impact on the "natural" world and global sustainability. The Simon and Erhlich bet now famous in economic and environmentalist circles did little to sway any one perspective on the issue. The Cornucopian's beliefs in the powers of technology and market forces and Malthusian's belief in impending social/economic collapse remain as dialectically opposed as they always have been.

The Malthusian belief system is summed nicely in this quote from Paul Erhlich "The twentieth century has been extraordinarily successful for the human species—perhaps too successful. As our population has grown from one billion to six billion and the economy has exploded to more than 20 times its size in 1900. We have overwhelmed the natural systems from which we emerged and created the dangerous illusion that we no longer depend on a healthy environment." (Lomborg, 2002)

The Cornucopians perspective "Malthus is wrong; resources have not grown at linear rates but rather have tracked the exponential growth of human population…. as demand increases for products the "hunting and gathering" process occurs as one

resource becomes too expensive the path dependent behavior of economies changes and technology creates substitutes for the product." (Lomborg, 2002) Rather than the arithmetic versus geometric dichotomy of Malthus natural resources and human consumption the intervening factor has been technology and substitutability of products to meet human needs. But first things first, the Simon and Erhlich debate is now celebrating its 25th anniversary and it seems appropriate to examine premise of the bet again and see if 15 years of globalization and continued human expansion has altered the results since 1990. Below in table format are the results of a 2005 analysis of the market price of the original five metals comprising the Simon and Erhlich bet.

In the original bet, Ehrlich and Simon created a composite index based on a basket of five metals. Ehrlich and Simon's basket of metals included chrome, copper, nickel, tin and tungsten. In this updated analysis, the same basket of metals is reconstructed at 2005 inflation-adjusted prices. Table 1 presents the price data for the 2005 analysis. This data is based on each metal's average price as recorded for the month of March 2005.[1] (See Table 1 for a list of the March 2005 average price quotes for chrome, copper, nickel, tin and tungsten.)[2] In Table 1, each metal's average price per unit value is converted to a standardized unit of 1980 U.S. dollars/lb. (See Table 1 for the 2005 metal price data in 1980 U.S. dollars/lb.)

Table 1
Commodity Average Price in March 2005 Converted to 1980 U.S. dollars/lb

Commodity	Average Price March 2005 (2005 U.S. $/units)	Conversion to 2005 U.S. dollars per pound (lb) (2005 U.S. $/lb)	Conversion to 1980 U.S. dollars[f] per pound (lb) (1980 U.S. $/lb)
CHROME[a]	0.75 ($/lb)	0.75	0.31
COPPER[b]	3378.38 ($/mt)[g]	1.53	0.64
NICKEL[c]	16179.05 ($/mt)[g]	7.34	3.04
TIN[d]	8419.76 ($/mt)[g]	3.82	1.58
TUNGSTEN[e]	145.00 ($/stu)[h]	7.25	3.00

According to Table 1, in March 2005 chrome had an average inflation-adjusted price of $.31/lb. Similarly, at the start of 2005, copper, nickel, tin and tungsten sold at the inflation-adjusted prices of $0.64/lb, $3.04/lb, $1.58/lb and $3.00/lb respectively. In order to update the Ehrlich and Simon composite index, these inflation-adjusted price levels are multiplied by the quantity of metal that was in the original Ehrlich and Simon basket. The original basket included 51.28 lbs of chrome, 195.56 lbs of copper, 63.52

lbs of nickel, 229.1 lbs of tin, and 13.64 lbs of tungsten. In the original bet, Ehrlich and Simon purchased $200 worth of each metal. As a result, the quantity of each metal in the basket is dependent upon the original investment ($200) in each metal and the original price of each metal in 1980. For example, in 1980 $200 bought 51.28 lbs of chrome. In 2005, after adjusting for inflation, 51.28 lbs of chrome has an inflation-adjusted value of $15.94. (See Table 2 for the 2005 inflation-adjusted commodity value of each metal.)

Table 2
2005 Commodity Value[a] in 1980 U.S. dollars

Commodity	Average Price March 2005 (1980 U.S. $/lb)	Commodity Value March 2005 (1980 U.S. $)
CHROME	0.31	15.94
COPPER	0.64	124.18
NICKEL	3.04	193.17
TIN	1.58	362.57

[a] Commodity Value equals the product of the commodity average price March 2005 (measured in 1980 U.S. dollars/lb) and the Commodity Quantity (measured in lbs) designated in the Ehrlich and Simon original bet. Let Q equal designated quantity from Ehrlich and Simon original bet then Q copper = 195.56lbs, Q chrome= 51.28lbs, Q Nickel = 63.52lbs, Q Tin = 229.1lbs, Q Tungsten = 13.64lbs.

Table 3 presents the results of the updated 2005 composite index and compares it to the earlier values calculated for 1980 and 1990. For Ehrlich and Simon, the original basket of five metals costs a total of $1000 in 1980. By 1990 the same basket, after adjustments for inflation, was worth a total of $618. This is a 38.2% decline in value over a ten year period. In 2005, the same basket has a total inflation-adjusted value of $736.84. This is an increase in value since 1990 but an overall decrease in value of 26.3% since 1980.

TABLE 3
Comparison of Commodity Values (in 1980 U.S. $) for 1980-1990 and 1980-2005

	Commodity Values in 1980[a] (1980 $)	Commodity Values in 1990[a] (1980 $)	Commodity Values in 2005 (1980 $)	Percent change 1980-1990[a] (%)	Percent change 1980-2005 (%)
CHROME	200.00	163.00	15.94	-18.5	-92.0
COPPER	200.00	120.00	124.18	-40.0	-37.9
NICKEL	200.00	193.00	193.17	-3.5	-3.4
TIN	200.00	56.00	362.57	-72.0	81.3
TUNGSTEN	200.00	86.00	40.98	-57.0	-79.5
TOTAL	1000.00	618.00	736.84	-38.2	-26.3

[1] Average monthly price data for each metal as recorded in the third quarter of 2005 was also examined and yielded similar results to those found with the March 2005 data.
[1] Metal prices for copper, nickel and tin are based on the average cash price recorded for March 2005 by the London Metal Exchange. The prices for chrome and tungsten are based on the March Free Market Data Guide reported by American Metal Market.

The decline in this 25 year period from 1980 to 2005 supports the claim that long term trends will evidence declines in commodity prices as time permits improvements in technology to occur. These long run declining trends occur despite shorter term fluctuations in prices. As before, this composite index which is based on a basket of five metals is not broadly representative of the wider commodity base. Although macroeconomic trends influence the metal industry as a whole, microeconomic supply and demand factors in each metal market plays a major role in defining the equilibrium price and quantity observed in each of the metal markets.
For example, tin recorded a decline in value from $200 to $56 from 1980 to 1990. This short term decline was the result of the collapse of the International Tin Agreement (ITA). This agreement included both tin-producing and tin-consuming countries. The ITA attempted to stabilize tin prices by using stockpiles to adjust supply. The ITA collapsed in 1985 and tin prices fell. As a result tin prices reached their lowest levels in the latter half of the 1980s.[3]

In 2005, the inflation-adjusted value for tin was $362.57 compared to the $56

value recorded in 1990. This increase in value is a result of the increasing global demand and constrained supplies of tin mining which exists today. The increase in the demand for tin is attributed to several factors. Globalization and, in particular, the increase in Chinese income has fueled the higher demand for tin. In addition, tin is now considered as a possible input for lead-free solders in the electronic industry.[1] As for the supply side, since 1985, the costs of mining tin have increased particularly in Asia. These increases in costs have slowed growth in current mining activities.

With tin prices on the rise in the short run, however, Simon would predict that greater incentives will exist for firms to develop technology to access harder to reach supplies and overcome higher production costs. In addition, higher prices will encourage producers to find lower priced inputs as a substitute for tin. According to Simon, over the long run, time will allow such innovations to occur so that we should find a decline in tin prices over the long run or rather in another ten to 25 years.

Conclusion

The replication of the Erhlich and Simon wager demonstrates once again that human ingenuity and market forces respond to scarcity and higher prices through innovation and substitution. In spite of increase consumerism across the globe from rising middle class societies, the issue of the exhausting of natural resources appears to be no more accurate in 2005 than it was in 1980, when Erhlich and Simon made their original sustainability wager. “The free, competitive marketplace is the most efficient engine of resource creation and conservation because it is the most explosive engine for intellectual and technological advance. The size of resource pie is determined not by nature but by the social and economic institutions that set the boundaries of technological advance. Closed societies and economies under the heavy hand of central economic planners are doomed to live within the confines of dwindling resource bases and eventually experience the very collapse feared by the conservationists.” (Taylor 1992) While the truth of sustainability lies somewhere between optimism of Cornucopians and the pessimism of environmental Malthusians, this study indicates that Simon’s view prevails again in the 21st century.

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