

## The Economics of the Very Long Run

by

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*Abstract:* Will mankind survive the next billion years? It is of course impossible to give any definite answer to this question. However, it may be possible to discern which of our present policies will increase, or decrease, the likelihood of that eventuality. This can be done not with any precision, to be sure, but educated guesses are sometimes more helpful than completely ignoring an important, nay, crucial, question. The present paper is devoted to a discussion of which public policies are more likely to promote the survival of the human race, and which to lessen it.

### *1. Introduction*

One of these millennia, if the environmentalists are correct, the earth will cease to be able to support the human race. If we have any affection for this species, we had better hope that it by that time attains the ability to travel interplanetary distances, and has been able to colonize such heavenly bodies as our moon, Venus, Mars, asteroids or perhaps the satellites of Jupiter or Uranus. Also, taking the *very* long run view, the day will perhaps come when the sun will either explode, incinerating the inhabitants of our entire solar system, or be extinguished like a candle with no more wax - to the same deadly effect, if less spectacularly, and through excessive cold, not heat. By that time it will behoove the human race to have the means of interstellar travel at its command, plus the ability to colonize planets and moons in other solar systems.

Is it worthwhile even discussing this futuristic, science fiction problem? Many would reply "probably not". For some, a discount rate of pretty much anything greater than zero would be sufficient to banish into total insignificance something which will not occur for a million or even a billion years from now - even when the survival of the entire human race hangs in the balance. Moreover (so might the critic of the present paper continue to argue), if our species lasts long enough that such heroic meas-

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ures become necessary to save it, we can probably leave the solution to our descendants. If they have not picked up the requisite knowledge needed to save themselves by that time, an argument can be made that they (i.e., we) are not worth preserving.

Finally, the critic of the present discussion might note that "given the rate of change of knowledge about the foundations of life in the context of an environment that is the subject of historically rapid change, the very distant future, to say nothing of even the moderately long run, can best be characterized as radically uncertain".<sup>1</sup>

And yet, and yet. It cannot be denied that the present discounted value of something not to occur for eons is very low. But we are talking about a rather large value to be derived at that time. As well, there are other reasons to entertain a discussion that may not now have much practical value.

For one thing, there is the pleasure of entering a presently lightly visited intellectual realm. Publications addressed to the issue of what to do when the sun destroys itself are not in excess supply. For another, there might be no need to discount by a time preference rate at all: If it were the case that what holds for humanity in the long run also holds in the short run, then whatever policy proved optimal based on very long run considerations would also be the preferred policy for the here-and-now, regardless of the discount rate. In such a world where social policies have comparable effects on humanity itself both in the short and very long run, we sacrifice nothing by introducing policies based on our present analysis right now, even though their long run benefits (which will be the focus of the present paper) will not kick in for millions of years. Further, analyzing present day public policy from so untoward a perspective may shed light on it that would otherwise be unavailable. As well, we shall not really be directly discussing "the question of survival in a million/billion years' time".<sup>2</sup> Rather, we will be focusing our attention on what can be done now, or at least in the very short run, in order to most likely raise the probability of our species' success in the long distant future. There is also the possibility that worldwide doom is not quite so far off as might appear. Yes, the sun exploding, or extinguishing, is an event for a very far off year. However, the specter of a giant meteor or comet crashing on the earth cannot as easily be dismissed for the foreseeable future. Indeed, the present authors believe that the value of saving the entire human race is of such a high magnitude, that virtually any positive probability of a cataclysmic event (such as a giant meteor crash) would render the present discussion worthwhile.

## 2. *Economic analysis*

Let us, then, entertain this question. Specifically, what can we do, now, to increase the

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<sup>1</sup>We owe this point to an anonymous referee of *Homo Oeconomicus*.

<sup>2</sup>This is the phrase of an anonymous referee of *Homo Oeconomicus*.

probability of the survival of the human race in these far off epochs?

It is likely premature to start investing in rockets, fuel, moon-walks, etc. It would appear that the US government has jumped the gun in this regard. It spent some \$25 billion in the 1960s for the moon shot, but did so long before further space exploration could be footed on a commercial basis, the only guarantee of further efforts in this direction. That is, if colonization of the moon or Mars can be done for profit (e.g., Friedman, 1989, chap. 19), it is much more likely to attract further investment than if it must be financed with compulsory (tax) levies. Had NASA been a private enterprise, it long ago would have fallen victim to bankruptcy proceedings. Another problem with NASA from this perspective is that it refused to take an American tourist aboard, even for \$20 million, and instead allowed its Russian counterpart to do so.<sup>3</sup> In order to be a leader of the pack, it is important to not get out too far ahead of it. The U.S. government is guilty of precisely this economic sin, because it undertook this wasteful extravagance long before it was efficient for others to follow up on, and solidify, this engineering attainment.<sup>4</sup>

There is, in every economy, such a thing as a structure of production (Garrison, 2000; Cwik, 1998; Barnett, 1989). To attempt to produce a lower order good (moon walk), before the higher order goods are in place (e.g., fuels, rockets, human environments in space, education, general technology, etc.) is to court economic disaster. Böhm-Bawerk (1959 [1884]) stressed the importance of roundabout methods of production, in which greater physical output could be achieved per unit of input, the longer the production period in which land and labor inputs are “invested”. Even though he wrote over one hundred years ago, his analysis has as much relevance now as it did then. The optimal structure of production in space exploration (or anything else) is determined by the marginal or market time preference rate, because the physical superiority of roundabout production processes must be offset by the longer waiting time these methods entail. But the correct rate of time preference, we know from the critics of the planned economy (Hoppe, 1989; Mises, 1981 [1969]; Boettke and Anderson, 1993), can only be derived from the free workings of a market where people spend and invest their own funds. Hayek (1948) stressed that information flows would be subjected to an economic arteriosclerosis in the absence of freely fluctuating market prices. An even more thoroughgoing and basic criticism of central planning is that prices emanating from this quarter lack the benefits of the crucial appraisal process (Salerno, 1990, 1992 and 1995; Block and Garschina, 1995) of freely operat-

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<sup>3</sup>See on this <http://www.msnbc.com/news/742302.asp>.

<sup>4</sup>Ayn Rand (Russian author of such bestselling novels as *Atlas Shrugged* and *The Fountainhead*, and whose philosophy of Objectivism stresses the immorality and inefficiency of government meddling) is usually considered an advocate of markets, not socialism. In the case of space travel, however, her usual political economic acumen was overcome by the superficial pyrotechnics of this engineering accomplishment. See Rand (1969 [1988]). For a critique of this episode, see Block, forthcoming.

ing economic actors. Nor is there any reason to suppose that these insights apply to more pedestrian goods and services, but not to space exploration and colonization.

It is impossible to fully anticipate the future workings of the market, and it is always dangerous to mention specifics regarding the roundabout process that will optimize space colonization. Nevertheless, several contours seem discernable through the fog. For example, it is likely that university courses in mathematics, physics, and chemistry will have more to do with success in this field than women's studies, queer studies, black studies, and multiculturalism, at least as they are typically taught in universities today. Indeed, the entire postmodern movement denies the existence of objective truth, a stance which can only retard the discovery of physical laws and mathematical theorems.<sup>5</sup> A public educational system which subsidizes studies in postmodernism at the expense of the hard sciences is thus likely to reduce - however slightly - the ultimate survival of the human race.<sup>6</sup>

Another consideration is the population question. If we are to aspire to other planets, let alone to the stars it is likely that people of the ilk of a Newton or an Einstein or a Hawking or a Gates will be crucial in leading the way. But men of this sort come along only once in every few billions or so of population. Thus, looking at the population issue from this perspective tends to undermine the contention that at present there are excess numbers of people (Kremer, 1993; Simon, 1996; Coffey and Block, 1999). True, "Renaissance Europe did not have a population of billions, and yet produced numerous geniuses".<sup>7</sup> However, "the more the merrier": if the human race is to successfully overcome the plight it will eventually face, we need all the geniuses we can get, and higher quality ones to boot. Sheer numbers, *ceteris paribus*, cannot but help in this regard.<sup>8</sup>

The Columbia tragedy of February 2003 is only the tip of the iceberg in this regard. That is, this disaster serves as further evidence that NASA's activities are premature, in that the complementary resources are not yet in place. This does not mean that space exploration is not justified *per se*; rather, it suggests that a governmental initiative in this direction, divorced or at least protected from the usual market signals

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<sup>5</sup>We are grateful to an anonymous referee for this argument.

<sup>6</sup>This does not apply to the study of history, classical literature (of the "dead white male" variety), psychology, etc. Even though none of them can help directly in man's reach for the stars, they certainly can be of use indirectly, as the storehouse of past human wisdom that will be sorely needed wherever we go.

<sup>7</sup>A point made by an anonymous referee of *Homo Oeconomicus*.

<sup>8</sup>Of course, one of the conditions of the "*ceteris paribus*" clause is that the population does not exceed the carrying capacity of the biosphere. However, the present authors agree with Julian Simon (1996) that the scarcest resource of all is the ingenuity of the human mind, and that the optimal number of people (given current technology and resources) is much higher than the current figure. The present authors believe that the mass starvation plaguing certain parts of the world is due to government interference with food delivery; after all, there are never any famines in capitalist countries.

and incentive structures, is far more risky than this activity in their absence. This is not to say that a private enterprise effort along these lines would be totally free of such a catastrophe. But if it did occur, the firm responsible for the mishap would lose vast sums of its own money, and likely be forced into bankruptcy. In sharp contrast, NASA is still in operation, and has not had its wings clipped by any market forces.

### *3. Other necessary conditions for survival*

While speaking of the importance of large numbers of human beings so as to increase the probability of the arrival of a genius or inventor, it is important that when they arrive they not be murdered. One implication of this is that wars between states, and on the part of governments against their own citizenry, be decreased as much as possible (Courtois et al., 1999; Rummel, 1996; Conquest, 1986). Another is that the private murder rate, particularly against those segments of the populace from which most geniuses arise (Levin, 1997, 291-332), be radically reduced. After all, if the human race blows itself up in a nuclear conflagration during this present century, we will not last until the longer run when space travel might begin to be important.

Another relatively short-term danger has to do with the possible collapse of the biosphere, or the occurrence of global warming, or the creation of an ozone hole through which the sun's rays will kill off the human race, or any such other environmental calamity. Unless and until we somehow resolve these threats, the human race will not survive until the very long run, when space travel will be required for salvation. According to leftist environmentalists (e.g. Commoner, 1990; P. Ehrlich and A. Ehrlich, 1990; Gore, 1992; Mills, 1989; Porritt and Winner, 1988; Rifkin, 1980) or "watermelons" (green on the outside, but red on the inside), the best way to protect ecological values is through government regulation or outright nationalization of certain ecological resources (such as old growth forests or wetlands). In sharp contrast, in the view of free market environmentalists (e.g. Block, 1990; Block, 1998; Block and Whitehead, 1999; DiLorenzo, 1990; Hill and Meiners, 1998; McGee and Block, 1994; Rothbard, 1990; Stroup and Goodman, 1991), the exact opposite obtains: this goal may be best attained through a defense of markets and the institutions of private property.

And, of course, a third challenge is that our economic system continues to be capital and intelligence intensive enough such that rocket ship construction, on a massive scale, will be a possibility. If the countries of the earth can maintain, and even boost their rates of growth, this might be a viable scenario. On the other hand, if they falter,<sup>9</sup> again, all talk of escaping the planet will come to naught.

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<sup>9</sup>An anonymous referee calls for "models of the most diverse developments of society," as well as "catalogues of measures." For a comparison of nations in these dimensions, see Gwartney et al.

#### 4. *Specialization and the division of labor*

Does everyone have to put his shoulder to the wheel of interstellar travel? What of people who become butchers, bakers and candlestick makers? Are they to be considered slackers in this long run “race” to the stars?

Not a bit of it. They are no more to be considered a detriment in this quest than is the pulling guard in football. This athlete may never score a touchdown on his own, but he makes it possible for the running backs to do so. Without the pulling guard, the full back would be stopped at or before the line of scrimmage, let alone make any yardage. In like manner, were there no butchers, bakers and candlestick makers, to say nothing of the myriad of other occupations not directly related to space conquest, the chemists, physicists, mathematicians, engineers and computer scientists - most likely our main source of deliverance - would have to perform these pedestrian tasks for themselves. Every marketplace job, without exception,<sup>10</sup> no matter how humble, aids in this overall job of saving the human race. And this specifically includes dishwashing, hamburger flipping, floor sweeping, etc. Thanks to specialization and the division of labor, we are all in this together, the economically mighty and the humble as well. This holds, too, for tasks such as entertainment (acting, musicians, computer game creation); if left undone, these jobs might or might not have to be undertaken by those with talents more directly related to reaching the stars. Moreover, space flight is by no means the only task allotted to mankind if it is to save itself. That is, we still have to survive until that far away day when it becomes imperative for us to leave the earth, and we begin to have the ability to do so en masse. Even if this were our only job, the astronauts and explorers still need to be entertained, if only to increase their productivity toward this long run goal. Thus *all* working people involved in free markets play a role, no matter how modest, in this vital project.

There are, of course, parasites: those who live off the rest of us (e.g., unjustified welfare recipients and “corporate welfare bums” who receive vast government subsidies<sup>11</sup>), and, worse, those who are actively engaged in reducing the contribution made

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(1996). On the basis of this study, one may extrapolate that societies which are economically free not only evidence the greatest amount of wealth (a precursor to humanity’s saving of itself) but also the largest increases in national income, an even more difficult task (given that it is harder to maintain any given percentage rate of increase when you start at a higher level).

<sup>10</sup>What about the job of teaching queer studies at the local college? This is not a marketplace job, insofar as the local college is typically either a public enterprise, or a quasi-public one which receives large government subsidies and is thus private in name only. The present authors predict that such courses would be absent from most (if not all) truly private educational institutions, which would be accountable to paying customers.

<sup>11</sup>There is a sharp distinction to be made between a welfare recipient parasite - whether a poor person on the dole or a rich “corporate welfare bum” who receives vast government subsidies - and the inheritor of great wealth, in terms of their contribution to the greater good. In the former cases, the

by their betters; the bureaucrats from the so called “Justice” Department who prosecuted and persecuted Microsoft spring readily to mind in this connection (Anderson et al., 2001). With the help of the long run perspective being adumbrated in this paper, we can perhaps see these people in a new and not at all flattering light. It is only something of an exaggeration (only because we are now so early in this quest) to state that they are a threat to the survival of the entire human race. But if this sort of behavior long continues into the future, it is no great leap of logic to see their actions in exactly this light.

A possible charge<sup>12</sup> against the perspective being urged in the present paper is that the social (as distinct from the economic) model it seems to be promoting is reminiscent of that of Plato’s *Republic* (<http://plato.evansville.edu/texts/jowett/republic.htm>). This is a system, it might further be contended, against which Hayek argued on the ground that it would lead to “serfdom” (Hayek, 1944). But nothing could be further from the truth! First, the free enterprise system, with its emphasis on individual rights, is just about the polar opposite of the Platonic system, in which the philosopher king takes on a leading role in ruling the lives of his subjects. Second, Hayek’s *Road to Serfdom*, far from being an antidote (as it is typically supposed) to the Platonic rule by philosopher king, makes numerous and fatal concessions to this very system (on this see Block, 1996).

All we have really done in this paper is consider the impact of certain social policies and trends on the ability of humanity itself to survive into the distant future. We feel that such long-run considerations have been largely absent from the debates over issues like industrial policy and educational curricula. We have argued that certain “social choices”, such as China’s limitations on family size, have higher costs than previously thought, and that other social choices, such as rewarding individual merit in academia (rather than affirmative action goals), have higher benefits than would be apparent from short-run considerations alone.<sup>13</sup>

Of course, policymakers have different value systems. Philosophical anarchists (such as the present authors) would agitate, say, for the abolition of antitrust legislation even without considering the fact that unfettered industrialists will be more likely to discover profitable methods to take humanity to the stars. Staunch Marxists, on the

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money is taken from its rightful owners in taxes through compulsion, under the threat of force; in the latter, the income or wealth transfer is purely voluntary. Far from the recipient of a bequest being a drain on society, he performs the role of enhancing incentives to discover, initiate, invent, engaging in entrepreneurship, etc. Most people who engage in such activities do so for the sake of their children. Were they forbidden to do so, e.g., via a 100% inheritance tax, much of their reason for persevering would be atrophied.

<sup>12</sup>An anonymous referee of *Homo Oeconomicus* urged us to consider this possible objection.

<sup>13</sup>These observations are of course complementary. To say that policy *X* has a higher opportunity cost than previously thought is equivalent to saying that there exists some policy *Y* that has a higher benefit than previously thought.

other hand, are probably so devoted to the goal of material equality that they would still favor income redistribution even after realizing that this scheme will lead to a (greatly discounted) loss of utility from the knowledge that the survival of humanity is thus rendered more precarious.

In the middle of these extremes, however, are individuals who may be persuaded to endorse laissez-faire policies and other values from Western culture once these long run considerations are brought to light. It is largely to these people that the present paper is directed.

Viewed in this way, the thesis of the present paper does not rely on “strategic” considerations; we have merely added terms (whether positive or negative) to the flow of utilities yielded by various policies. It is as if the central planner wishes to invest in Project X or Project Y, and up till now was ignorant of the fact that one of the projects offered an extremely large payoff in some remote (but finitely distant) period.

This formalization shows the inapplicability of Selten’s Chain Store Paradox and the various Folk Theorems, despite their superficial relevance that early readers of this paper have noted. For example, Selten’s paradox arises because the operator of a chain store (by the logic of backward induction) would choose not to engage in a costly price war with competitors, even though were such a stance maintained over time, the operator’s long-run payoff would be higher. At first glance, this result seems relevant to the present analysis, since it deals with actions that are costly now but have a long run payoff. However, despite the superficial resemblance, this is not analogous to our present discussion. For example, if society has been investing in mathematics and physics all along, then *it will be completely rational* to invest in them during the period before the destruction of the earth, in order for humanity to escape. But in Selten’s paradox, the chain store operator (even if he has fought competitors in all previous rounds) will find it optimal to acquiesce to a competitor in the final round. The situations are thus completely different: Selten’s paradox deals with the problem of time-consistency, and the inability to commit to a strategy that is not part of a sub-game perfect equilibrium. What we are doing in the present paper is far less subtle; we are merely arguing that most economists have been incorrectly assessing the true costs of certain policies. We take it for granted that there is no time-consistency problem in this realm; we believe our descendants will take the necessary steps (started by us) to ensure humanity’s survival, if only our descendants perceive what those steps should be.

The situation is similar with the various Folk Theorems. These theorems deal with the critical discount rates necessary to achieve long run “cooperative” behavior in repeated games in which the one-shot game payoffs render such cooperation impossible. Thus there is a superficial similarity to the present discussion, since we can imagine, e.g., that proponents of queer studies would be willing to give up their pet courses for the sake of more math, but only if other interest groups reciprocated and sacrificed

their own favored courses. However, the various Folk Theorems are not directly applicable, since there is no analog to the punishment strategies by which cooperation is achieved in the repeated games of the Folk Theorems. For example, if the proponent of queer studies refuses to acquiesce, then the proponent of women's studies may follow suit; but this "punishment" will not hurt the advocate of queer studies in particular or even humanity in general in the short run, it will only increase the likelihood that humanity will perish at some far distant date.

### 5. Conclusion

We have addressed an important topic: the survival of mankind.<sup>14</sup> The problem we as a species face is that it is by no means a foregone conclusion that we will continue forever. In the very long run, our planet will become uninhabitable, no matter what we do. By that time, we must have the means to change our abode. But in the medium run, a failure of the economy, or a war that cripples or destroys the earth, or a massive environmental catastrophe, will render this moot: we will not be in a position to move to another, more hospitable, location.

Considering this, we must ask: "How is it possible to organize social policy (economic policy, environmental policy, science policy, etc.) at the present time, so that the probability that this problem can be solved can be raised, and thus the likelihood of the survival of mankind can be increased?" In our view, the solution to this problem is necessarily connected with space travel and human settlement on other planets, both within our solar system (initially) and then ultimately on planets in other universes. Our claim is that the sooner and more thoroughly we embrace the system of *laissez-faire* capitalism, the greater the probability of the survival of the human race.

In one sense, we totally eschew the question of how the economy can best be "steered" to this end. Free enterprise, after all, is incompatible with any aspect of "navigation", in this sense. On the other hand, we have not been able to totally confine our imaginations. For example, we speculate that the study of science, computers, metallurgy, fuels, etc., may be more conducive to this end than an intellectual investment in women's or queer studies, and that money spent on investment in human scientific capital will yield greater returns than that given over to supporting welfare recipients. However, we are certainly not advocating that the government *force* people to study mathematics or physics (indeed, we wish the government to get out of education altogether); only the market system of profit and loss, in which individuals engage in competitive processes to see whose ideas are best, can yield the "right" outcome.

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<sup>14</sup>We owe this formulation of our paper to an anonymous referee of *Homo Oeconomicus*. We have heavily borrowed from his words, and are only saved from a valid charge of plagiarism by this present acknowledgement.

Our perspective is thus compatible with that of Hayek (1948), who famously insisted that no one person, authority, or central planner could collect the relevant “knowledge of the particular circumstances of time and place” in order to improve upon the market’s outcome.

Most disputes in the social sciences, whether over antitrust legislation or educational policy, ultimately reduce to a difference in philosophical premises and forecasted consequences. We hope to achieve some consensus in this paper by arguing that the survival of humanity - surely a goal sought by virtually all commentators - depends on the specifically Western institutions of (unfettered) private property and a (classical) liberal education.

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