

**“THINKING LONG TERM”: INVESTING TODAY
FOR A MARS FUTURE TOMORROW**

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ABSTRACT

In 1944, a New York woman invested \$5000 - one time - in a stock portfolio. At the time of her death 51 years later, her estate, based on that growth of that single managed investment, was worth \$22 million. A \$4000 investment in Coca-Cola in 1919, just after it's reorganization, would today be worth over \$600 million. These are not "fluke" data. Despite a major depression, a world war, 3 other major conflicts, a Cold War, and several recessions, the US stock market gained an average of 10.4% per year over the entire 20th Century.

It is the nature of governments to spend wastefully, rather than truly invest for the future. All government bureaucracies, NASA included, are forced by the D.C. budget process to spend their allotted budget, in order to maintain funding commitments the following fiscal year, in a “use it or lose it” policy. Could such “waste” be measured, and had it been consistently invested in growth equity markets over the last 30 years, NASA could be almost self-sustaining today!

Despite a record-breaking period of economic growth, the author will show figures to prove why the cost of the colonization of Mars will never be borne by the U.S. government alone, heralding the call for global partnering, and as quick a move as possible to private sector entrepreneurial firms and investments.

The author will show common-sense methods by which small investments made now, by increasingly larger groups of people, can yield vast rewards for future generations – such as seed funding for a Martian colony. The key, as in any worthwhile endeavor, is patience and perseverance.

PART ONE: COLONIZATION - CAN THE U.S. GOVERNMENT "GO IT ALONE"?

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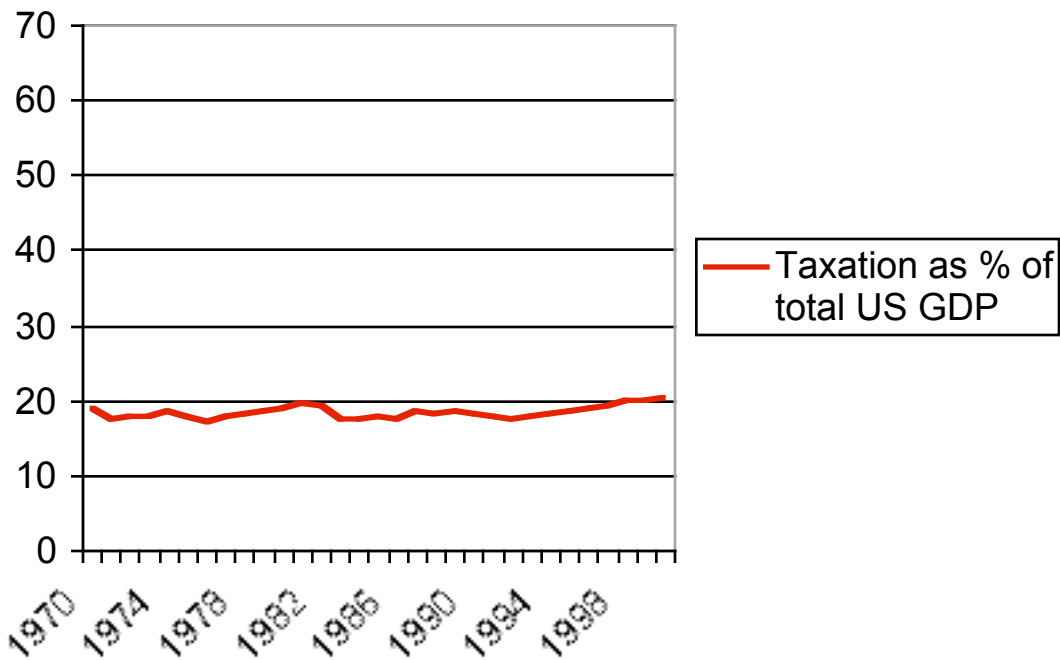
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One of the prime missions of the Mars Society is to help mobilize public support for missions to the Red Planet. This is a laudable goal and should, of course, be pursued. But this pursuit should also include a clear picture of all the obstacles we face in taking that road, and the history behind them. This paper will attempt to provide that picture here, and offer a compelling supplement - if not an outright alternative - to that strategy.

If our shared goal was merely exploration of Mars, NASA - having first been blessed and budgeted by Congress - as it initiates nothing without Congressional approval - could no doubt achieve that goal by 2012-2014. But our purpose is Mars *settlement* - a functioning series of self-sustaining colonies, as a spearhead for the next phase in the evolution of human civilization. Settlements cost a lot more than exploration missions, and no one government could foot that bill alone - not even the US, by far the wealthiest and most powerful nation on Earth today.

"What," you say? "The US economy is larger than at any time in history, boasting an astounding 9 Trillion dollar Gross Domestic Product for 2000. If we only shifted a few national priorities, we could afford it easily!"

I can silence that argument with one word - one I will employ later. For now, though, let's look at some more history:

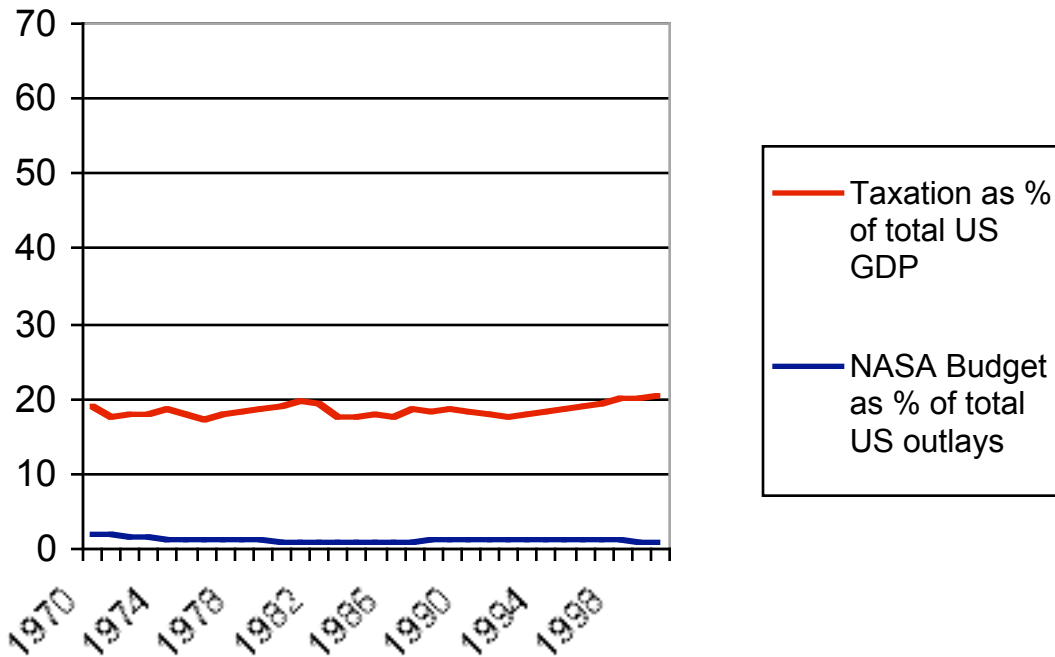


Source: Office of Management and Budget

Although I have data from the Archives going back as far as 1934, I have chosen to concentrate on the last 30 years only for purposes of presentation.

The first line in the chart I wish to address tracks total US tax receipts as a percentage of GDP. As you will notice, that line is relatively flat, only varying between 17.5%-20.6% over the last 3 decades. This is actually rather an interesting discovery - regardless of the growth of government taxation and spending (and people's complaints about it), the growth of tax receipts is not in any real way disproportionate with the US economy as a whole. It was 20% as far back as the height of World War II in 1943, and hit its only low point of 14.4% in 1953. Other than that exception, the line for the last 50+ years is pretty much as you see here, relatively flat.

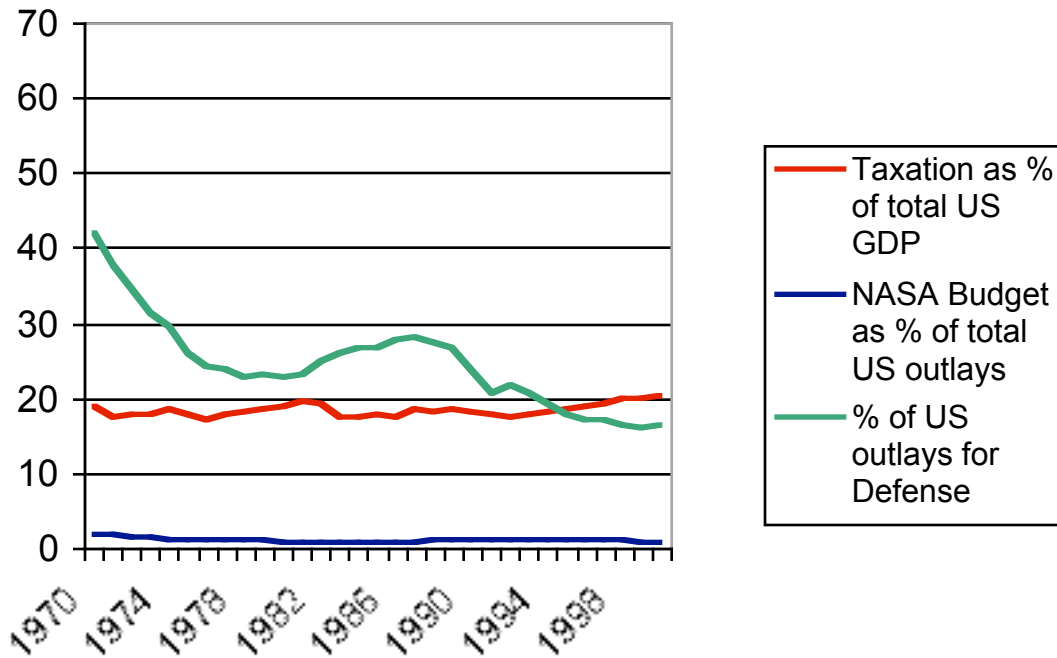
Now let's add the next line:



Source: NASA

The second line in the chart depicts the NASA budget, as a percentage of the Federal budget as a whole over the last 30 years. Here, also, that line is relatively flat, varying between a 1970 high, at the height of the Apollo program, of 1.9%, to an all-time low of 0.7% in 1986, in the wake of the Challenger disaster. This averages out to be 1.02% of US expenditures annually. Since that flat line runs relatively parallel to that of total tax collection relative to GDP, it can be said that NASA's budget has grown at an almost linear pace with that of government as a whole. Many would claim we are getting a lot of bang for that buck, considering. But we're far from finished...

Now let's add Defense spending:



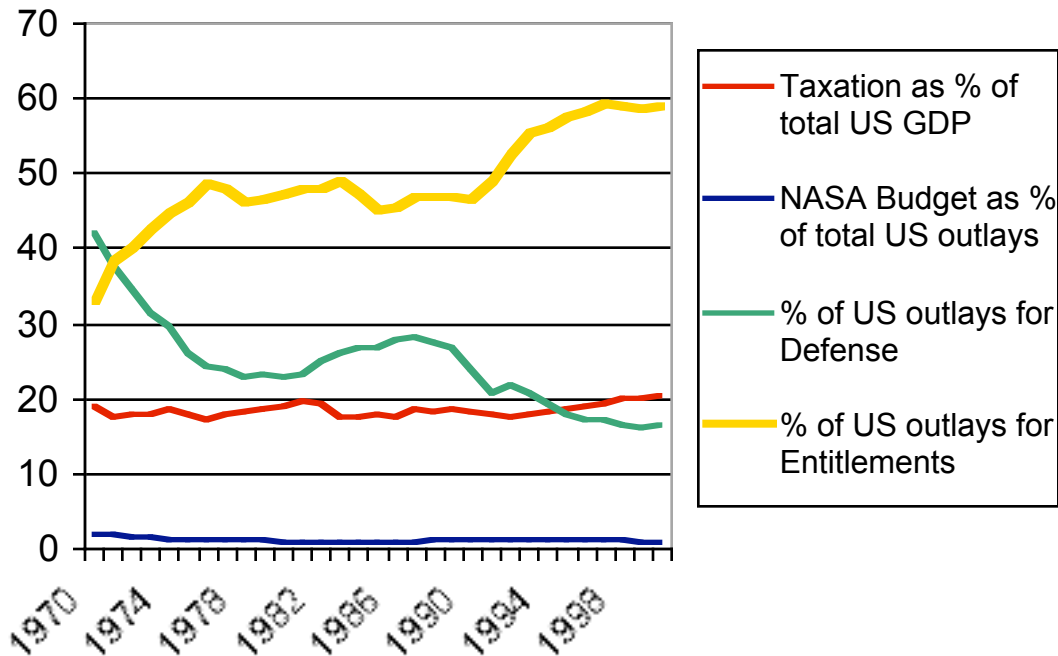
Sources: Office of Management and Budget, General Accounting Office, NASA

Hey, looking better, isn't it?

The green line in the chart shows the Defense budget, also as a percentage of the Federal budget, over the last 30 years. Here, we have a definite downward trend. Remember the "peace dividend" we were supposed to get from the end of the Cold War? This line would suggest that's finally happening. Of course, remember that it's only the percentage of military spending out of the budget as a whole that has dropped. Keep in mind that when you think about the red line, government budgets have grown at a tremendous rate, right along with the economy, and federal outlays today are 9 times what they were in 1970! If you are the Secretary of Defense, which would you rather have, 41% of \$280 billion, or 16% of \$2.5 *Trillion*?

Even so, with all that huge economy and drop in real defense spending, federal funding of Mars colonization should be a snap, right? Not so fast...remember, spending in real dollars grew from 280 Billion to 2.5 Trillion in the last 30 years. So, if taxation has remained constant, NASA spending has remained constant, and Defense spending has dropped, where is all the money going? Therein lies the rub...and the "one word" that could shoot down all our government-funded Mars dreams:

"Entitlements"...



Source: IBID

Here is the Great Budget Killer that everyone in D.C. is too politically correct to talk about, the overwhelming burden on the body politic. I gave the line a gold color and a thicker weight for that reason. Entitlements, or "direct payments to individuals" (by GAO definition), is indeed, for 10's of millions of Americans, the "golden goose".

Entitlement spending was only 27% when John F. Kennedy committed us to the race to the Moon. It had only grown to 33% by 1970. But with Vietnam winding down, and interest in lunar adventures waning, the social pressure was on to increase funding for all the Great Society programs initiated by Lyndon Johnson. The tap continues to increase its flow, projected to reach the 67% mark by 2005 - think about it - by 2005, a full 2/3 of the taxes you pay goes directly into someone else's pocket, with government being the great middleman. If that goes on, the government of the US will be totally bankrupt by 2030 - unless, of course, that 50-year, 1-to-5-ratio history of taxation-to-GDP, that "hidden covenant" with the American people is dramatically *altered*. That could cause the economy the tax-base depends upon to spiral down dangerously, thus killing the proverbial Golden Goose.

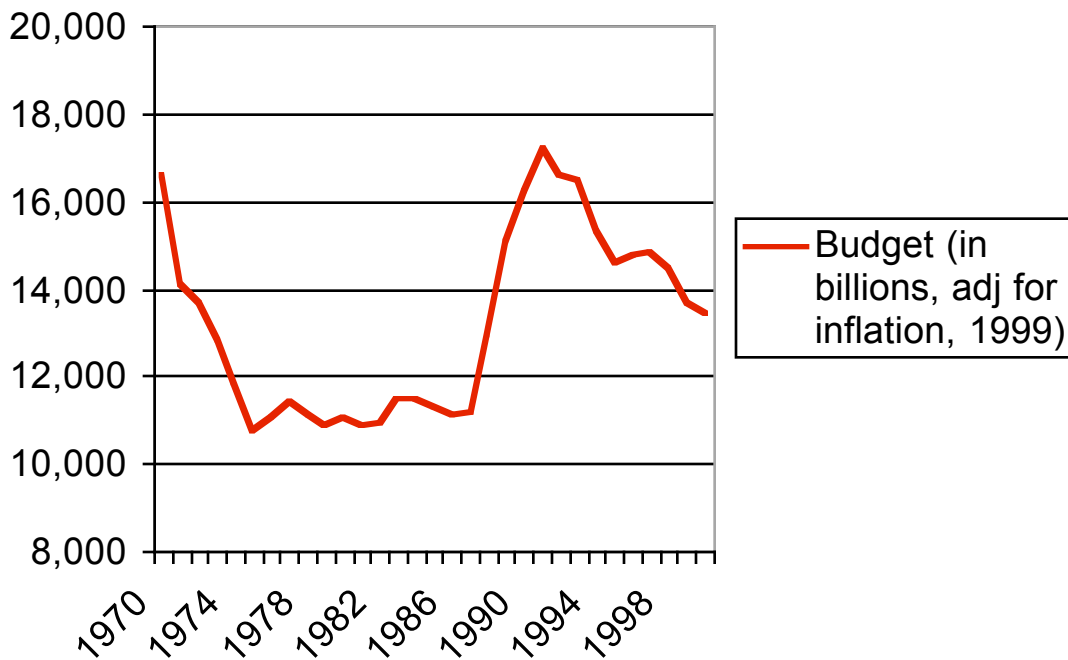
That huge number of entitlement recipients also amounts, today, to a large and powerful lobby and *voting bloc*. At the risk of being labeled cynical, I must conclude that Congress would

shut down NASA *completely* before allowing that voting bloc to lose its meal ticket. The dream of Mars will die with it.

PART TWO: IS NASA WORTHY?

Even if we could somehow craft a salable Mars-settlement strategy to the US Congress, is the only space agency we have - NASA - capable of carrying the ball?

Again, let's look at some figures:



Here is the history of NASA's budget, in adjusted-1999 dollars, from 1970 to the present.

In that time we have seen the end of Apollo, then Skylab, Pioneer, Viking and Voyager, the Shuttle, the Hubble, Pathfinder, and now the ISS. Since Apollo, all manned space activities have been limited to low Earth orbit. Are we getting bang for our space buck? Again, in inflation-adjusted dollars, NASA has spent over the last 3 decades over \$409 Billion. In "reverse inflation", that's \$88 Billion Apollo-era dollars - or, the equivalent of spending 3 2/3 total Apollo program budgets! For that kind of spending, we should have stood on Mars at least once, in all that time. \$409 Billion spent over the last 30 years should have definitely given us more than we currently enjoy as a society, not to mention the fact that private space ventures should have been encouraged, rather than stonewalled, by the Agency.

Where does NASA's money go? A significant chunk, nearly half, goes to the costs of expensive and sophisticated machinery for the Shuttle missions. According to NASA Chief Dan Goldin, \$5 Billion/year is spent on launch alone. The shuttle itself has been criticized for years as being too complicated and expensive to maintain, and has kept the cost of space flight at \$10,000/pound, which was exactly the same amount we were paying, in constant dollars, during Apollo.

PART 3: THE POWER OF THE MARKET

In 1995, Ms Anne Schreiber of New York City passed away quietly. She had a long, full, but rather unremarkable life. Like most people, she left behind an inheritance. In fact, the only reason we ever heard of her was that she deeded her entire estate to New York's Yeshiva University. Ms. Schreiber's personal net worth at the time of her death was approximately \$22 Million. A little research uncovered that 50 years earlier, Ms. Schreiber had taken \$5000 meticulously saved, and invested it in the US equity markets. She, along with the assistance of her broker, had conservatively and conscientiously traded and managed that single, one-time investment, through 4 wars, 3 recessions, and decades of political upheaval and change, to reach that 1994 valuation.

Immediately after World War I, the Coca-Cola Company was considered all but dead. It's product, a green colored, uncarbonated, cocaine-laden concoction, having been packaged as a health elixir since the 1880's, had lost its appeal in the marketplace, in the light of tastier competition. On the verge of bankruptcy, they had two options: change or perish.

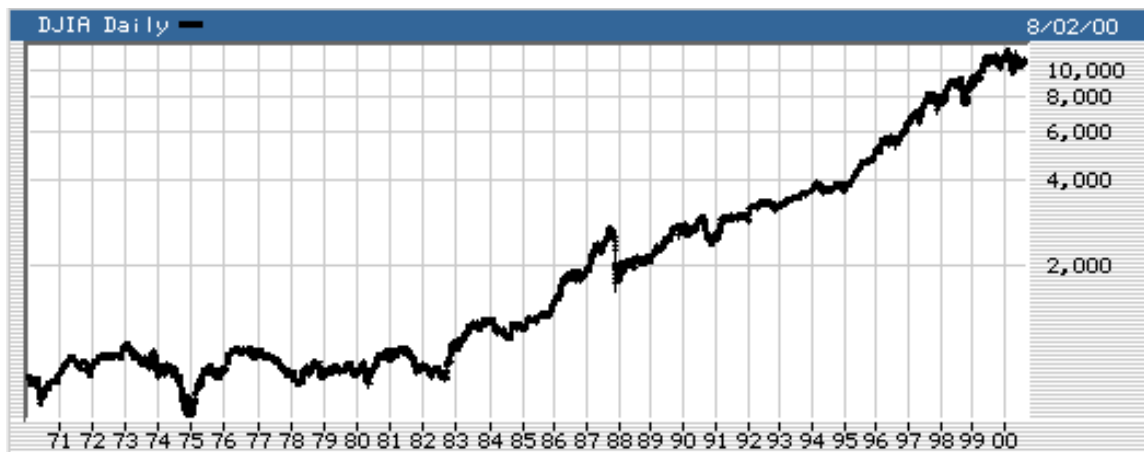
So they changed. Almost overnight their product evolved from the "substance" described above to the product we know today, and their marketing plan refocused itself towards the product merely being a tasty, refreshing mass-market thirst quencher. They reorganized the company, and floated a new stock offering in 1919 to raise the initial capital for the product relaunch.

Had your grandfather or great-grandfather made a \$4000 investment in that stock offer in 1919, your inheritance would today be worth an astounding \$622 Million!

These examples are by no means "flukes". There are millions of unsung stories out there, told by hundreds of companies and millions of individual investors over the last 80 years, concerning the power of equity markets in the US, and how investing long-term yields incredible benefits for those who are willing to *think* long-term and stay the course.

The chart on the next page indicates why. While over a short term (like this year) the market may appear to fluctuate dramatically and cause short-term investors fits, the *long* term is a very different story. In 1972, the Dow broke 1000 for the first time. 29 years later, it's

averaging around 11,000. The point is, that despite short-term problems, the general trend of the markets is - *always* - upward. In the 20th Century, the Dow rose an *average* of 10.4% annually - despite depression, recessions, wars, and significant sociopolitical change. Unless western civilization collapses entirely, and with it, the rest of the global economy, there is no compelling reason to believe that this trend will not only continue, but also even improve during the 21st century - particularly if we can manage to stay out of the aforementioned global wars and depressions.

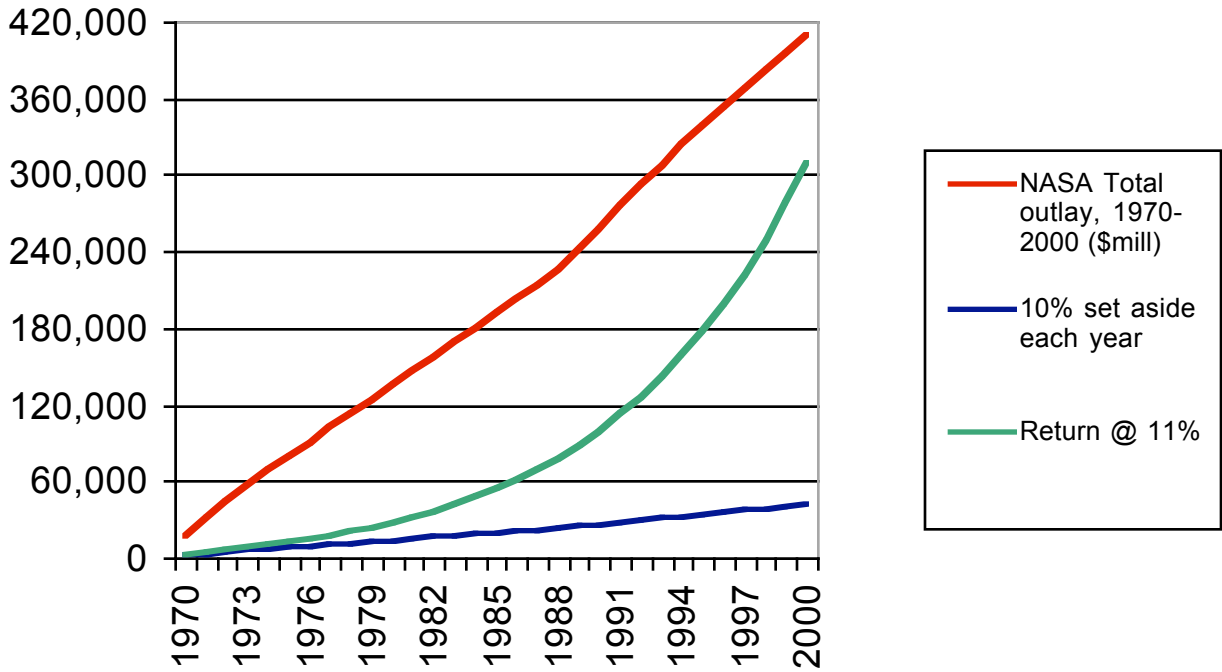


Okay. We've established that markets are good things, and relatively safe places to invest for long-term growth. Now, what does this have to do with Mars?

In any major human endeavor, fiscal commitments must be made long term. Governments have shown that, given the political will, large-scale projects can be successfully achieved, from the Suez Canal, to Hoover Dam, the invasion of Normandy, the Manhattan Project, and Apollo. Most of these projects were crash programs, with little or no budgetary constraints, Herculean tasks performed in response to a specific challenge, be it the threat of Hitler or the threat of Communism. In most cases, however, there was a societal threat involved. Once the task was accomplished, the threat vanquished, the public political support rapidly dwindles, priorities change, funding shifts – sometimes dramatically.

What I am attempting to promote here is a major paradigm shift: changing *our thinking about how mass-scale projects are funded and accomplished*. The USA no longer has any major threats to its security and stability. Given that, political will to accomplish grand-scale projects via the public purse is far more difficult to gather and retain than it would be under conditions of threat or crisis. The American body politic has devolved into competing subgroups of special interests, all vying for their piece of the pie. The only major bloc left consists of all those receiving entitlement payments.

Fortunately, we can bypass all that D.C. infighting and use the power of the strongest economy ever created to our advantage. Lets take another look at the NASA numbers, in the chart on the following page:



The first line is the NASA budget, 1970-2000, adjusted for inflation. The second line is 10% of that budget. For the sake of argument, I am positing that ANY government bureaucracy’s budget has, at minimum, a 10% “fluff factor” built into it. This is not cynicism – this is the conclusion of many DC-watchdog groups and think tanks such as the Heritage Foundation, Taxpayers Union, Common Cause, and the Cato Institute.

The third line is the result, when I take 10% of NASA’s annual budget, and invest it in the equity markets, at an average rate of 11%. It is a relatively simple compound interest calculation, not accounting for market fluctuations, or changes in capital gains tax laws. Even so, the results are impressive. After 30 years of relatively mundane investing, NASA would be able to fund itself entirely for 6 years, without taxpayer contribution of any kind! If we begin to manage those assets far more aggressively, using Peter Lynch’s Dow Dividend approach, or David and Tom Gardner’s “Foolish Four” strategy, long-term returns as high as 23% annually can be achieved – and indeed, ARE being achieved today by millions of savvy investors.

Of course, this sort of thing is not going to happen with a government agency in our lifetimes. This was a sort of thought experiment to prove a point. We can’t even compel NASA to set aside 1% of it’s annual budget to research humans-to-Mars technologies, although R & D is

part of it's mandate! Governments simply don't think that way – and that is why *we* must. Staying in the game for the long haul is the only reasonable way that humanity will ever have an opportunity to settle a new world.

So what should we do?? Simply put, we should invest – as many of us as possible – all over the world, any way we can. We should get involved in commercial funds, investment clubs, whatever it takes.

One example: Introduced at the Mars Society Convention in Toronto in 2000, was a concept called the Ares Fund. Its proponent, Clifford McMurray, suggested that although the Mars Society should always seek out and develop whatever sources of funding that make themselves available, that the membership as a whole might set a great public example by paying for it themselves, i.e., by investing a small amount of dollars in a long term fund, as a sort of ultimate backup plan. 4000 members times \$250 per member – one time – for a total of \$1,000,000 - into an investment pool, managed over the course of *the entire 21st Century*, if need be. The result at the end, however, would be enough cash to enable future Mars Society members to mount their own commercial missions!

Our own “Colony Fund” venture capital initiative is also moving forward. When it is in place (by 2003), millions of small investors all over the world will be able to invest a small amount over a long term, to help build the commercial and technical infrastructure necessary to one day – perhaps 30 years hence - support planetary colonization.

But overall, as I have shown above, success always depends on three things:

Dedication, Faith, and Patience

SOURCES:

NASA

U.S. Office of Management and Budget

U.S. General Accounting Office

The Motley Fool (David and Tom Gardner) – for their 30-year stock market chart