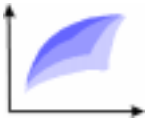
Efficient Frontier



An Online Journal of Practical Asset Allocation

Edited by William J. Bernstein
and Susan F. Sharin

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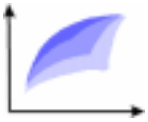
Table of Contents

Home E-Mail

Efficient Frontier



William J. Bernstein

How Much Pie Can You Buy?

During particularly bad days at the office, I have a recurring fantasy: Thomas Friedman, columnist for the *New York Times*, calls me up and says, "Bill, the world has my head spinning. I just can't keep the players straight any more—I'm shutting down my word processor and going fly fishing for a few years. Care to fill in?"

You see, Tommy's no ordinary scribbler. He's the "correspondent-at-large" for the Gray Lady. He gets to talk to anyone he wants and write about whatever strikes his fancy. Of course, I'm flattered—that's the sweet thing about this daydream—but I have to demur; I just can't turn the kind of stuff he does. Here's one of my favorites, from an essay dated October 17, 1999, shortly before the market peaked out:

> *The Dow Jones Industrial Average dropped 1,266 points today after Amazon.com announced that it had inadvertently made a profit…*

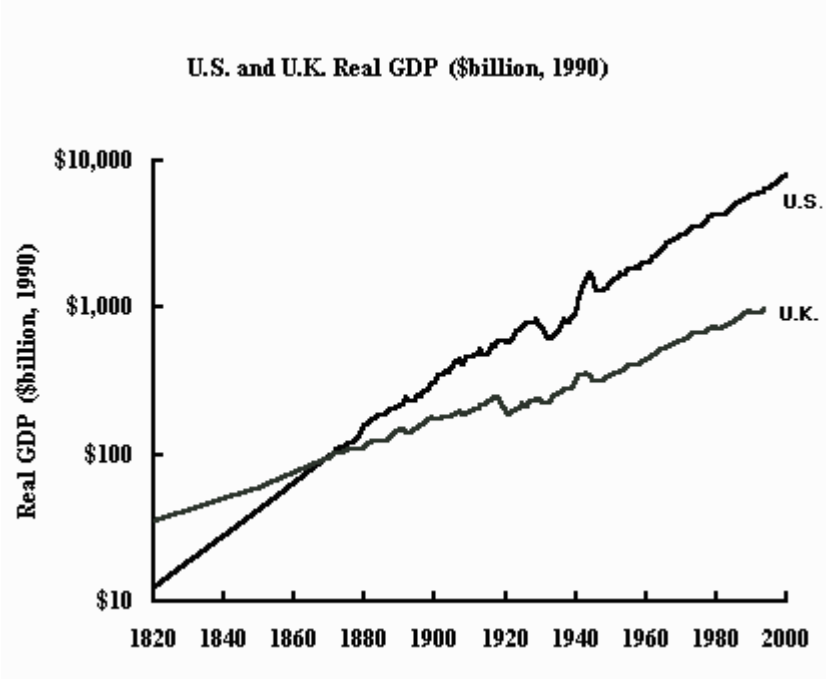
The main point of the article (preserved for posterity by a brave soul untroubled by the long arm of the *Times* legal department) was that in late 1999, it was no big deal that Amazon's pie-in-the-sky earnings prospects supported a sky-high price. But when Amazon finally developed real earnings—that is, when pie-in-the-sky became "pie-on-the-ground"—the company as well as the entire market suddenly became a lot less appealing. Or, as one of Tommy's mythical analysts put it:

> *"I swear, I thought Bezos' actual plan was to skip making a profit and go directly from being an I.P.O. to being an N.G.O. for distributing books cheaply," said another analyst. "I don't know what Amazon's future is as a company—but as a charity, wow! What a write-off machine! It could have been called "Unicef.com." Really, who's given away more kids' books at cost than Amazon?*

Almost on cue, the heavens turned into one enormous Friedmanian celestial pastry shelf. Its two main supporting brackets were technologically-driven acceleration of earnings growth and share buybacks. The trouble was, these two props weren't just weak; they simply didn't exist at all.

In the Beginning . . .

There is Gross Domestic Product. Over the long haul, this is the engine of corporate profits and thus of stock prices. Below, using data from Angus Maddison's wonderful "The World Economy: A Millennial Perspective," I've plotted the real GDP of the two winners of the global sweepstakes since 1820:

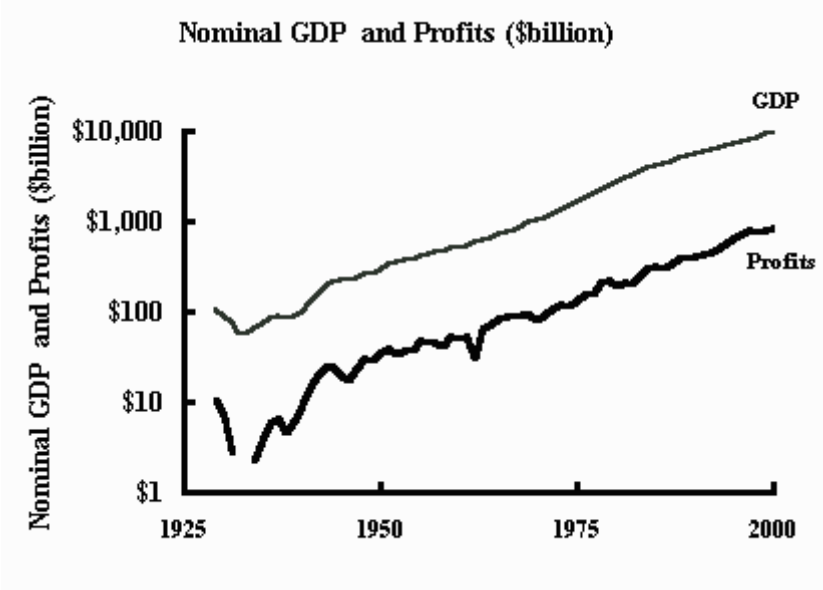


I've laid these data out on a semilog scale to depict the growth rates; since 1820, they were 3.66% and 1.97%, for the U.S. and U.K. respectively. (By the way, this pinpoints the eclipse of the British Empire a bit earlier than conventional historical analysis.) Most of the difference between the two nations can be ascribed to the fact that our population grew faster than Britain's—1.87% per year versus 0.58% per year. On a per-capita basis, the annualized rates of GDP growth are much closer—1.75% versus 1.38%.

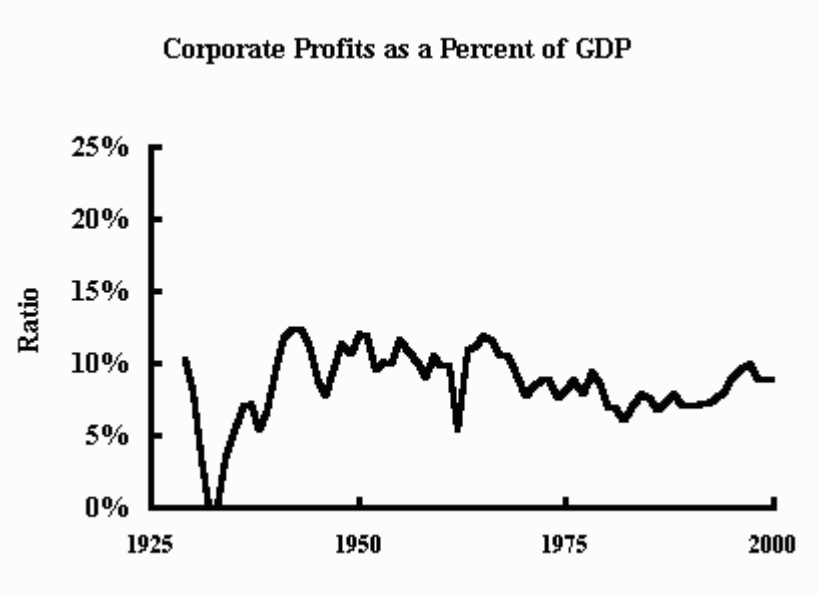
Step back and take a long look at the above graph. Anyone detecting a rapid acceleration of GDP growth in either nation during the past few decades should report immediately to his optometrist.

The Next Step: Total Corporate Profits

The next piece of the puzzle is supplied by the Bureau of Economic Analysis, the government's premier source of macro data. Switching gears ever so slightly, we'll use nominal (current) dollars from 1929 to 2000 to see how total corporate profits track GDP. The overall nominal growth rates for the seven decades are 6.63% and 6.41% respectively. (If you want to adjust to real GDP/profits, just subtract out the compounded 3.3% rate of inflation for the period plotted.)



Notice how smoothly corporate profits track GDP. To underscore this relationship, I've plotted the ratio of corporate profits to GDP:



Since the turmoil of the Great Depression, when earnings disappeared completely for two years, corporate profits have remained fairly constant at about 10% of GDP. This ratio is not without political and sociological importance; many on the political left have decried the portion of national income flowing to the corporate sector. The above plot negates this argument; this is no small blessing for the body politic.

Let's summarize what we've learned so far:

- Aggregate corporate profits and GDP both grow at a long-term real rate of approximately 3.5%.

- The ratio of these two has remained remarkably constant since the Great Depression.

How The Pie Is Sliced

So, the pie gets about 3.5% bigger each year, adjusted for inflation. The problem, of course, is that the slicing gets done far, far from your purview. One of the underpinnings of the 1990s buy-now-and-hold-your-stocks-forever happy talk went something like this: "Forget dividends. Corporations make much better use of their earnings buying back shares. This is a blessing for shareholders, since buybacks result in unrealized, thus untaxed, capital gains."

Let's look at the numbers. (We're still using nominal data.) Melding Bob Shiller's data with that of the Bureau of Economic Analysis, we see from 1929 to 2000, GDP rose by an annual nominal 6.63%, corporate profits by 6.42%, and per share profits by… drum roll, please… 4.98%. Wait a cotton-picking minute! This means that per share earnings—what you and I actually own—grew about 1.5% per year *less* than GDP and aggregate earnings! This can't be right! It implies, of course, that those nasty investment bankers have been watering down our shares at a 1.5 % rate. Well, I'm shocked, truly shocked.

Things were a bit different in the 1990s, bolstering the case for the paradigmistas: the numbers for 1990 to 2000 were 5.46%, 7.93%, and 9.06% respectively, suggesting that about 1% per year was being added to stock returns from buybacks during that period. But there's a reliability problem measuring earnings growth over such short periods, since over time spans of less than a few decades, things become very sensitive to starting and ending points. For example, begin the calculations in 1980, and the numbers change to 6.51%, 7.71%, and 6.35%. Goodbye buyback bonus.

I've summarized these nominal data below:

Period	GDP Growth	Growth of Total Corporate Profits	Growth of Per-Share Corporate Profits
1929-2000	6.63%	6.42%	4.98%
1980-2000	6.51%	7.71%	6.35%
1990-2000	5.46%	7.93%	9.06%

The rosiest data—from 1990 to 2000—suggest that there is about a 1% kicker to equity returns from buybacks, whereas the longer-term data suggest a 1.5% shortfall. An underlying principle of finance is to rely always on the longest time series; I have greater faith in the 1929 to 2000 numbers than on those from the last decade.

Some additional perspective is garnered in a piece by J. Nellie Liang and Steven A. Sharpe from the Federal Reserve Board Washington, D.C. They observed that from 1994 to 1998, corporations repurchased an average of 1.91% of outstanding shares per year. Unfortunately, this was offset by 0.87% of stock issued for options granted to employees, netting out to an overall repurchase of 1.04%, almost exactly what we calculated from the above (independently derived) data. Since employees were paying a portion of the market price for their options, the option grants were not a total loss for the companies. But the authors' key point was this: with earnings yields of only 3% (a PE of 30), the companies were paying an average of 29% of their earnings for buybacks in addition to an average 37% dividend payout.

The math here is pretty simple: add the 29% earnings buyback cost to the 37% dividend payout, and you have 34% of earnings remaining—about 1% of market cap—available for reinvestment. This is *not* tenable in the long term. Historically, U.S. corporations have sold at an earnings yield of about 7% (that is, a PE of 14) with dividend payouts of about 55%, meaning that they reinvested about 3% ([1- 0.55] x .07) of their market value each year. With only 1% reinvestment, the capital has to come from somewhere else.

The key issue, then, is the amount of "leakage" from long-term GDP growth to per-share earnings caused by net new stock issuance. Burton Malkiel, for example, in the latest edition of *A Random Walk Down Wall Street*, estimates per-share corporate earnings to grow at a 6.5% nominal rate. Combining this with 1.5% dividends and a liberal dose of "Please God, don't let multiples collapse from here," he arrives at an expected stock return of 8%. But as we can see, his estimated 6.5% per-share earnings growth rate sits between a rock and a hard place: corporations either have to commit funds to buybacks that in previous years had fueled earnings growth, or they revert to old habits and allow 1.5% of GDP growth (which, as we saw above, over the long haul averages 6.6%/3.3% nominal/real) to leak out, yielding the historical 5%/2% nominal/real per-share earnings growth rate. (By the way, no one can consider themselves a serious investor unless they read each new edition of *Random Walk* when it comes off the press. The seventh, written in 1998, is now available in inexpensive paperback.)

In the long term, obviously, corporate capital needs will not be met by the 1% of market cap left after paying for buybacks and dividends; *it must of necessity come from debt and new share issuance, either as primary or secondary offerings*. It made no sense, of course, for corporations to be net buyers of their own shares in the expensive 1990s to an even greater extent than they were in the cheaper previous decades. In the aggregate, one hopes that corporate treasurers are not stupid; when the ducks quack, they generally haul out the feed bag. In the end, long-term shareholders get neither pie-in-the-sky nor pie-on-the-ground. They get a steady stream of increasing earnings and dividends, diluted with a liberal amount of bread crumbs, courtesy of the investment bankers.

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*(The following piece appeared in the November 26, 2001 issue of **Barron's** and is reprinted with the kind permission of editor Thomas G. Donlan and Dow Jones, Inc. ---WB)*

Other Voices

Riding for a Fall

The 401(k) is likely to turn out to be a defined-chaos retirement plan

By William Bernstein

The past 12 months or so brought a revelation to many 401(k) participants: Stocks can actually lose money. This knowledge throws into sharp relief the serious flaws in the burgeoning defined-contribution retirement system. The average 401(k) account held just $41,919 -- woefully inadequate to meet the needs of the typical retiree, even allowing for further contributions and investment growth.

Some commentators, including *Barron's* Editorial Page Editor Thomas G. Donlan, have praised a bill from Rep. John Boehner, an Ohio Republican, that would allow plan administrators to contract with finance professionals to provide advice to participants running their 401(k) and similar accounts.

Too little, too late, and too expensive: Although the current system seems robust, the exodus from traditional defined-benefit plans to the employee-managed defined-contribution paradigm is a social and economic time bomb primed to explode sometime within the next few decades. Here are some of the reasons:

- Employees are not saving enough. A worker who earns a constant real salary from age 20 to 65 and saves 10% of it requires a 4% real investment return to sustain a 20-year retirement at the same inflation-adjusted salary level. But most younger workers have relatively low incomes and no savings at all; starting later, at age 30 or 40, raises the required real investment return to 6% to 8%.

- Future returns will not be nearly this high. The long-term price increase of stocks must track that of earnings and dividends. Over the past century, this has been 2% per year adjusted for inflation. New Paradigmistas point out that reinvested earnings, stock buybacks, and technology-driven improvements in productivity will result in increased earnings growth. But from 1950 to 1975, annualized real per-share earnings growth was 2.2%; from 1975 to 2000, it

was 1.9%. Add a 1.45% dividend yield and you get an expected real stock return of just over 3%. The 7% real stock returns seen in the 20th century resulted from a combination of this 2% real earnings growth and dividends averaging 5%; anyone forecasting the same returns going forward should wear a sign that says, "I Can't Add!"

- The average long-term investor will receive the market return minus plan expenses. The typical 401(k) plan is an absurdly expensive vehicle with fees approaching 3%, according to benefits consultant Brooks Hamilton. Add commissions and other costs from frenetic trading at the funds. The typical fund company services participants in the same way that Baby Face Nelson serviced banks.

- Poor allocation decisions further degrade performance. At one major company surveyed by Bart Waring of Barclay's Global, almost half the participants owned only one or two funds, incurring unnecessary risk. Worse, many companies encourage purchase of company stock in their retirement plans, exposing employees to the double jeopardy of losing both paycheck and nest egg if the company fails.

Watson Wyatt Worldwide examined 252 large companies with both defined-benefit and 401(k) plans for the 1990-1995 period. It found that the defined-benefit plans bested the 401(k) plans by 2.4% per year. (The defined-benefit plans were no great shakes; from 1987 to 1999, the nation's largest pension plans underperformed a 70/30 benchmark of global stocks and bonds by an average of almost 2% per year.)

Even scarier are the results in the 401(k) plans of the most prestigious financial services corporations: For 1995-1998, the annualized returns of the 401(k) plans at Morningstar, Prudential, and Hewitt Associates were 13.5%, 10.5%, and 11.8%, respectively, versus a 21.2% return for the global 70/30 mix. If employees at the nation's most sophisticated financial companies can't get it right, what chance do folks on the assembly line at Ford have?

Given low equity returns, high expenses, and poor planning, it is likely that most 401(k) investors will obtain near-zero real returns in the coming decades. Further, a substantial minority will have disastrous results. Only a lucky few will save enough and obtain the 4% to 8% real returns necessary for a comfortable retirement (that is, aside from their bosses, who were smart enough to retain their traditional defined-benefit plans). When the boomers retire between 2010 and 2030, most will find the cupboard bare. The inevitable government bailout will make the savings and loan resolution of the last decade look like lunch at Taco Bell.

Meanwhile, a real dogfight has erupted between investment advisors and the brokerage industry over the Boehner bill. Little wonder: In the July 23 edition of *Investment News*, industry sources estimated the size of this market at $18 billion per year. Calculated

against the total defined-contribution $3 trillion asset base, that's another 0.6% of annual return flying out of the pockets of employees and into the industry's coffers. The notion that several hours of canned questionnaires and PowerPoint presentations will turn the average corporate employee into a well-informed, disciplined investment manager is absurd to anyone with the remotest sense of financial history and human nature.

We've seen this movie before, and it doesn't end well. In the 1920s, millions read Edgar Lawrence Smith's *Common Stocks as Long Term Investments* and convinced themselves that they would never sell their stocks. Unfortunately, they did. The investment bestseller of the next decade was Lawrence Chamberlain's *Investment and Speculation*, which flatly stated that only bonds should be purchased for investment purposes. The late 1960s saw a renaissance of popular enthusiasm for common share ownership, with more than one-third of households owning stocks. Real returns over the next two decades were nearly zero, and by 1979, when *BusinessWeek* famously proclaimed "The Death of Equities," just 16% of households held stocks. The average participant is a long-term investor only the way that Tony Soprano is a Catholic.

The defined-contribution system is broken; we just haven't realized it yet. While it may be possible to fix it by providing participants with much closer attention to expenses -- the exact opposite of what the Boehner bill accomplishes -- it makes more sense to improve the defined-benefit system with equitable vesting, portability and liability protection. These plans operate at a much higher level of efficiency and competence, with correspondingly higher and more uniform returns, than the ever-growing hodgepodge of expensive employee-run accounts.

Such a paternalistic approach may offend those who make a philosophy out of self-reliance. But most people don't build their own cars or remove their neighbors' kidney stones. We should treat retirement investing the same way. If an employee wants to manage his own retirement account, he should at least be able to show competence in the basic principles of investing, such as the differences between stocks and bonds, the fundamentals of prudent diversification, and the impact of expenses on returns.

The self-managed defined-contribution concept is fatally flawed. While Wall Street pros may (or may not) be getting it right, the overwhelming majority of employees are floundering, bewildered by a subject they only dimly comprehend. The time has come to throw workers a lifeline, in the form of meaningful pension reform, before we all drown.

Home E-Mail

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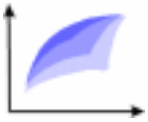


William J. Bernstein

Of Risk and Myopia

Of all of finance's mysteries, the most enduring is the so-called "equity-risk-premium puzzle"—why are stocks priced so low and, thus, their returns so high? In the 20th century, stocks rewarded more than 6% in excess of riskless T-bills. Surely, in an efficient market, investors would have priced stocks higher, with consequently lower returns.

This may now have already happened. With stocks yielding about 1.5% and long-term real earnings growth in the 2% range, stocks are priced for a long-term real return of about 3.5%. Until a short while ago, T-bills offered about a 3% real yield, but recent events have inflated the price of safety to the point where their real yield is zero. Thus, the expected equity risk premium is about 3.5%.

Richard Thaler and Shlomo Benzarti, in their classic article "Myopic Loss Aversion and the Equity Premium Puzzle" (*Quarterly Journal of Economics*, 1995), recalled a story told by Paul Samuelson, who offered a colleague a coin toss with a gain of $200 for heads and a loss of $100 for tails. Even though the coin toss had an expected return of $50 ([$200 x 0.5]-[$100 x 0.5]), his colleague turned him down. The reason: he would feel more pain with the loss of $100 than with the pleasure of a $200 gain. The colleague quickly added that he'd be happy to accept 100 such coin tosses, where in order to lose, he would have to flip less than 34 heads, the odds of which are less than one in a thousand.

This is, of course, highly illogical. Thaler and Benzarti realized that the key ingredient here was the *frequency of evaluation*: although Samuelson's colleague would happily accept 100 coin tosses, he could not bear to watch them being made singly.

To repeat: the risk tolerance of an investor is determined largely by how often he checks his portfolio. This is nothing new. Benjamin Graham commented in *The Intelligent Investor* that holders of obscure mortgage bonds happily held onto them through the depths of the Depression until they eventually recovered their value because they were highly illiquid and not often quoted. On the other hand, holders of frequently-quoted corporate bonds (far less risky but priced daily in the papers) panicked and sold after their initial drop. The largest financial holding of most families is their house—it's a good thing we don't see its value printed every day in the financial section.

Using a clever interpretation of Kahneman and Tversky's prospect theory, Thaler and Benzarti determined that stock investors behaved as if their time-horizon were about one year. Unfortunately, their methodology is a bit obscure. Recently, I came across a much more facile explanation of the risk-aversion-myopia phenomenon in Nassim Nicholas Taleb's *Fooled by Randomness*. (I highly recommend this delightful book to anyone interested in the role of chance in the financial markets. But be forewarned; many will find the author's ego a bit much. If literary self-absorption annoys you, better pass.)

The Taleb paradigm is stunning in its simplicity. Here's the short version: Over relatively brief periods, return increases proportionally with time but risk increases more slowly, as the square root of time. This means that the risk/return ratio becomes increasingly favorable over long time horizons.

But to start with, over short horizons, the risk/return ratio is extremely unfavorable. Imagine that stocks have an annualized return of 10% and a standard deviation of 20%. Over a time horizon of one day (1/260th of a year), the return calculates out to 0.038% and the standard deviation to 1.24% (20%/sqrt[260]). According to the laws of probability, the investor will see a positive return only 51.2% of the time.

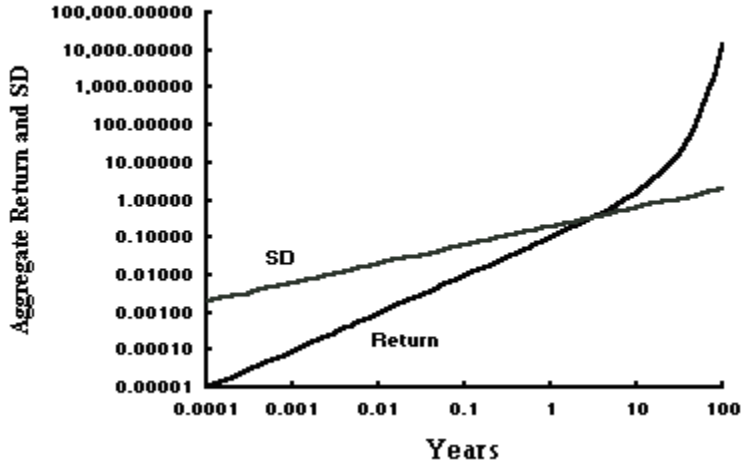
Now, assume that a loss hurts twice as much as a gain. The "utility" of our "daily investor" is thus –0.464 (that is, .512 – [.488 x 2]). With a 2:1 loss-gain utility function, 1.0 denotes perfect happiness; zero, ambivalence; and minus 2.0, perfect misery.) Even worse, our daily investor, like most investors, cares nothing for historical data. If he is trading actively enough, he may not even be able to determine reliably whether he is winning more often than he is losing. Since the average loss hurts more than the average gain, he soon loses heart and sells.

In the below table, I've calculated the return, standard deviation, probability of a positive return, and utility over varying time horizons:

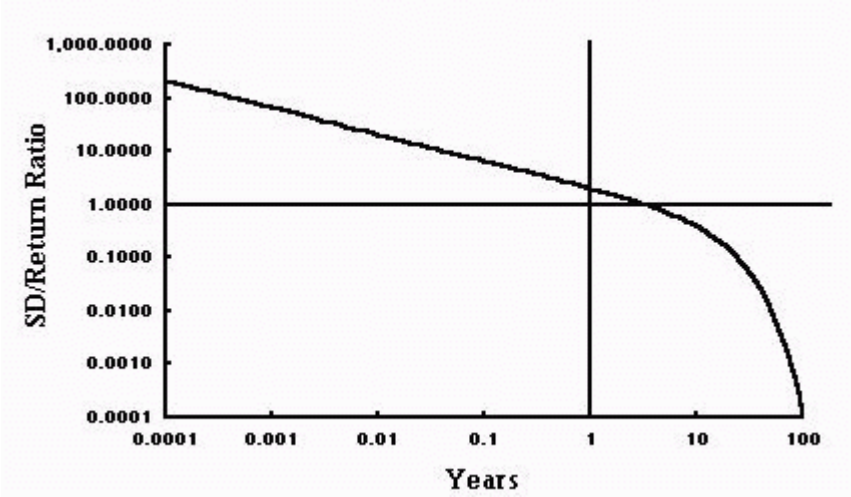
Time Horizon	Return	Standard Deviation	Positive Return Probability	Utility
One Hour	0.005%	0.438%	50.42%	-0.487
One Day	0.038%	1.240%	51.20%	-0.464
One Week	0.183%	2.773%	52.64%	-0.421
One Month	0.797%	5.773%	55.49%	-0.335
One Year	10.000%	20.000%	69.15%	0.075
Ten Years	159.400%	63.200%	99.41%	0.982
100 Years	1,377,961%	200.000%	100.00%	1.000

I've displayed this phenomena graphically with four "Taleb Plots." Note that in all plots, the annualized return is 0.1 and the annualized standard deviation is 0.2.

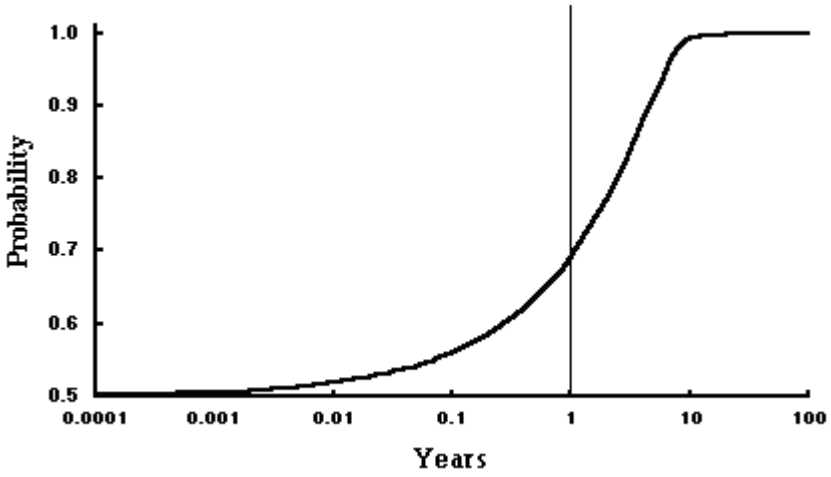
The first diagram, shown below, demonstrates how at very short time horizons, risk (standard deviation) dwarfs return, with the crossover occurring at about three years:



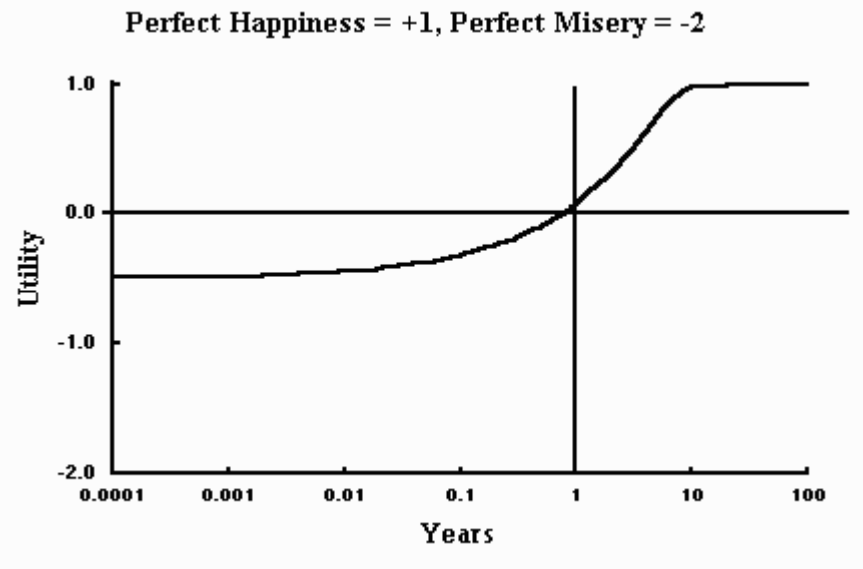
The next plot shows the risk/reward ratio:



Here's the probability of a successful outcome:



And finally, the utility to the investor with a loss/gain emotional ratio of 2.0:



The key, then, to a successful investing career is not just buy and hold, but *buy and forget*, something not easily done in our information-saturated society. Taleb's solution involves forcibly ignoring the news (and its frequent pricing). I imagine he must have some difficulty carrying that out, since he runs a hedge fund (Empirica Capital) that presumably is burdened by pesky folks called "clients," who may rudely want their positions calculated from time to time.

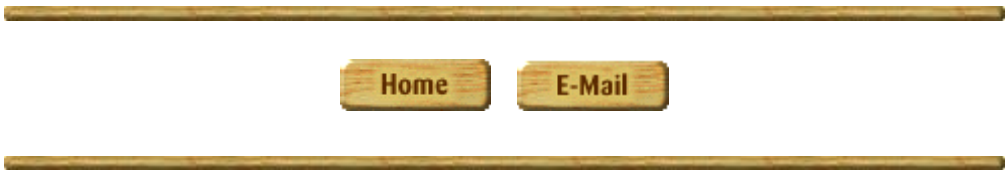
So how do ordinary folks, who do not live at the bottom of a well and are not gifted with the iron constitutions of Mr. Taleb and his clients, manage this trick? The key is to improve your utility function. The easiest way to do this is not to commit 100% to equity. One of my favorite bromides from *The Motley Fool* went something like this: "Every penny you don't have invested in stocks will hurt you." Until, of course, the inevitable point comes when you lose most of your pennies.

To be honest, I've derived no small pleasure from the collapse of the large-cap growth/tech sector over the past few years. The long-term investor must buy at some point, and lower is better than higher. Yes, the losses hurt, but such pain can be substantially mitigated by the availability of dry powder. Not to mention a markedly diminished density of smug neighbors.

One way of determining your optimal stock/bond allocation is to find that point where substantial market declines produce absolute equipoise: where the pain of loss is exactly counterbalanced by the pleasure of buying low. The only drawback to this method is that it takes decades to calibrate.

Which gets us to the last issue: whither the equity risk premium? Is it 3.5% and growing, as an increasing mass of investors, no longer playing with easy house money, find (as every generation does) that "risk" is the ugliest four-letter word in the financial dictionary? Or has the equity risk premium permanently shrunk as history replaces yesterday's demons with today's pale (but no less frightening) imitations?

If you know the answer, please write. Until then, here's my modern finance version of Pascal's wager: Unless you have a Taleb-like detachment from the here and now, prudent amounts of short-duration high-quality debt seem a no-lose proposition.



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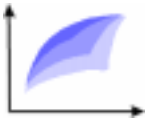


William J. Bernstein

So Long Valhalla,
Hello Risk Premium

What a difference a few measly years can make. Twenty-one short months ago, the tantalizing prospect of technology-driven global prosperity stretched endlessly to the horizon. But early in 2000, the dream slowly started to sour. At first, it was an abstract affair: investors finally began doing the math. And when they did, they found we had built more chip, fiber-optic, and even automobile capacity than could be consumed. They also realized that corporate earnings might not grow to the sky in industries operating under Hobbsean competition and 100 to 1000% oversupply. (In the infelicitous jargon of the dismal scientists, *malinvestment.)* As so often happens, these early losses awakened the investing public to something called *risk*. With that awareness, investors began to discount future earnings and dividends at ever higher rates, lowering prices still further.

The other shoe dropped on September 11. The world found out, in one murderous paroxysm, that history had in fact not ended, that ancient religious and not-so-ancient ideological fissures had not healed, and that the human race had yet to become one big happy family.

Suddenly, it looks like the bad old days again. Let's step back and take a glance at where we've been and where we're going. Here's the take-home cartoon:

	1999	**2001**
Expected Risk Premium	Zero	Average
Realized Returns	High	Low

During the heady days of 1999, the world was a wonderful place. You did not have to be a genius to earn high returns; you simply sent a check to Valley Forge or Boston, or less reliably, placed a call to your broker.

But anyone able to add could catch a glimpse of grimmer times ahead. The long-term real growth of earnings and dividends had not budged from the historic 2% rate, and stock yields barely poked above 1%. A future of 3% real expected returns beckoned. At the same time, real T-bill yields were also about 3%. *Thus, two years ago the expected risk premium was zero*. "This was just as things should be," said the optimists—in the long term, stocks weren't risky at all; thus they should command no premium. (To swallow this you also had to believe that the average investor actually knew the difference between a risk premium and a cheese blintz.)

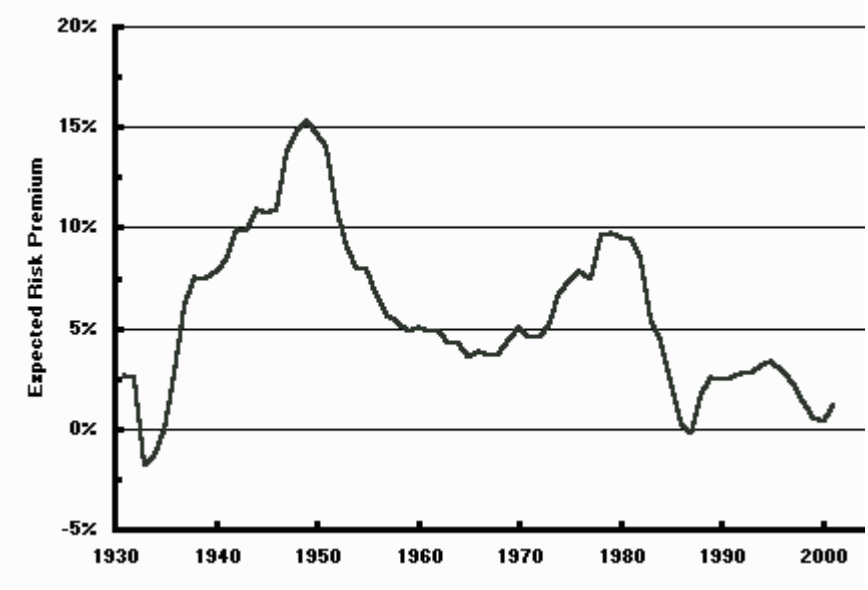
Fast forward two years. Chopping 30% off equity prices has adjusted dividends, and thus expected stock returns, upward by 70 or so basis points; this gets us to almost a real 4% return. From the perspective of earnings, things look better. The earnings yield also provides a good approximation of real expected returns: now about 4.5% for the S&P 500, 5.5% for foreign stocks, and perhaps

higher for value stocks. Let's be conservative and simply estimate real expected returns at 4.5%. The current real riskless rate? *Exactly zero.* (My friend Steve Dunn will argue that the new risk-free asset is the TIPS, with a 3.4% yield. Perhaps, but most investors do not put a significant portion of their portfolio in these vehicles. Only sophisticated folks who also have large amounts of tax-sheltered assets.)

Suddenly, we're looking at an expected risk premium of 4.5%. Not because stocks have gotten so much cheaper but because safety has gotten so much dearer. This is very similar to what the world looked like after 1960. But consider the state of the planet in June 1940, with Hitler staring at Dover through binoculars and the Soviet Union and the U.S. on the sidelines. A little more than a year later, Guderian would be doing the same at Moscow, and the pride of the U.S. Navy would be resting at the bottom of Pearl Harbor. T-bill yields? Close to zero. (Through a mathematical quirk, academicians calculate the T-bill rate for 1940 at minus 0.02%). Stocks yielded an incredible 7%, for an expected real return and calculated equity risk premium of 9%. The expected risk premium fell slowly from there, hovering at around 5% throughout most of the Cold War.

An expected risk premium of 4.5% seems about right for our times. Our parents and grandparents had to deal with Adolph Hitler and Joseph Stalin. Bin Laden's a very bad actor indeed, but not in the same league with our parents' bogeymen. I'll take the current state of the world, over that of 1940 or even 1950 with its big fat 9% equity risk premium, any day of the week.

In the below figure, I've plotted the expected risk premium over the past 70 years.



This plot is a dicey undertaking since it rests on a number of strong assumptions. The expected risk premium is calculated as the difference between the expected real return of stocks (which I define as the dividend yield of stocks plus 2%) and the real T-bill yield. Since inflation rates can be quite volatile, these are smoothed over five years. The plot is also hostage to the vagaries of inflation: The calculated expected risk premium in the early 1930s is lower than it would otherwise be because inflation was strongly negative, producing high real T-bill returns, even though nominal T-bill yields were near zero. And the equity risk premium is artifactually higher in the late 1940s for the opposite reason. Lastly, the near 5% current expected risk premium doesn't make it into the graph because of five-year smoothing.

As can plainly be seen, the expected risk premium declined from stratospheric levels to zero in the last half of the 20th century. Just as interest rates are a kind of societal "fever curve," so too is the expected risk premium.

So, welcome back to the future: the world of our fathers, with high risk premia and low risk-free rates. It's a more uncertain place than it used to be, but at least you'll be rewarded for shouldering that uncertainty.

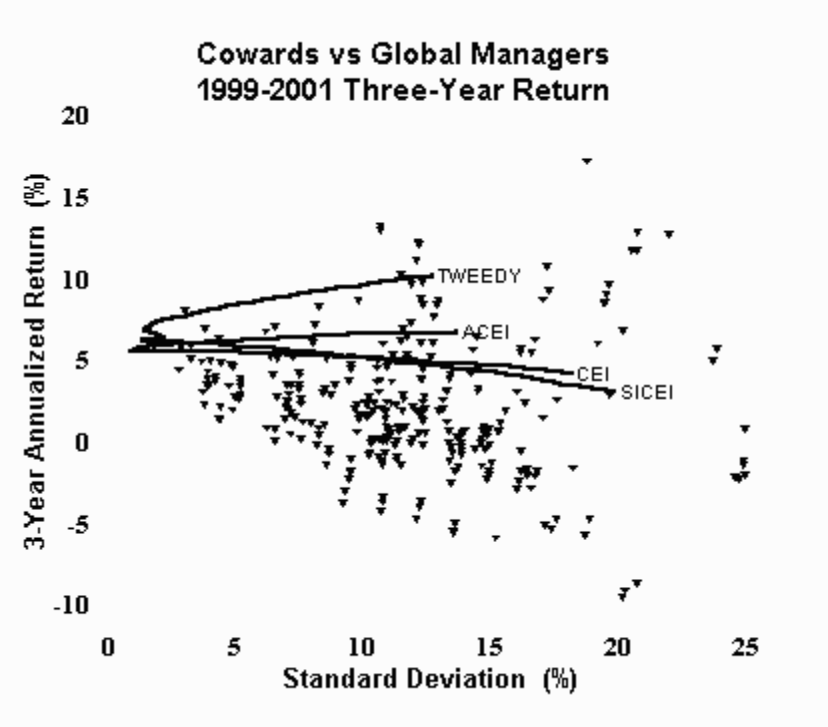
Efficient Frontier

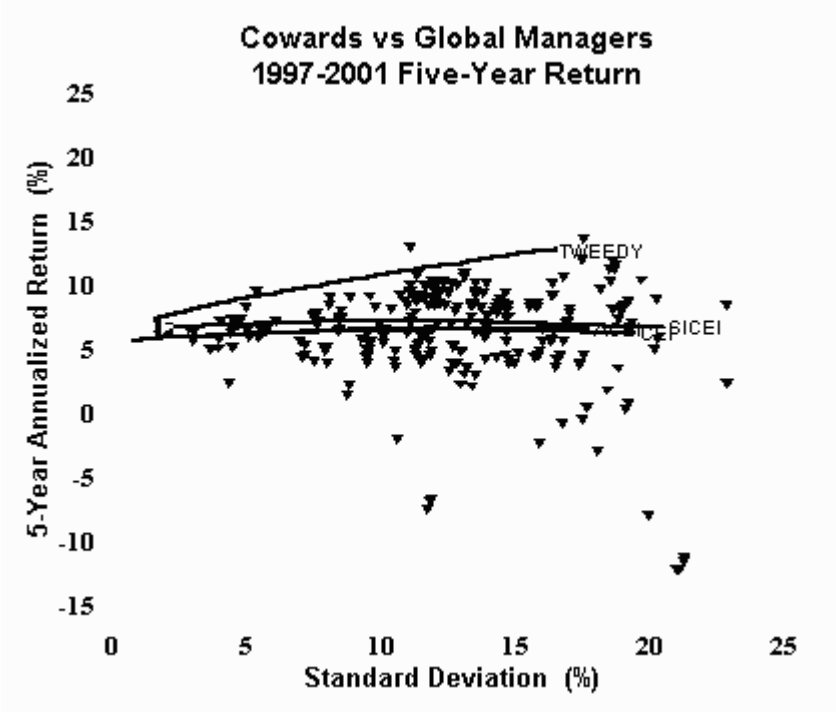
William J. Bernstein

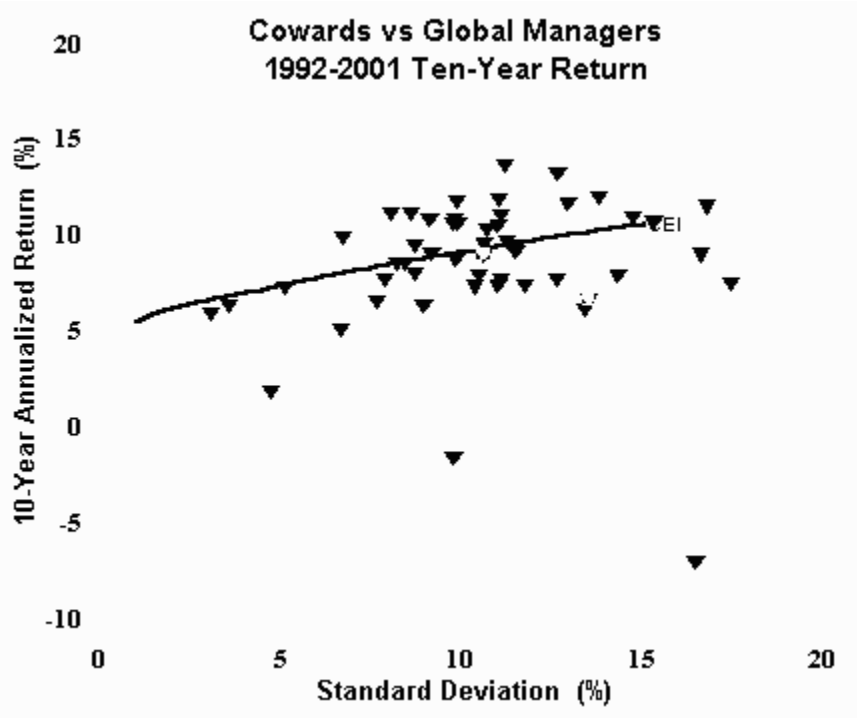
The Cowards' Update

In last year's update, we surveyed the improving condition of the cowards' portfolios, which had been battered by several years of S&P 500 dominance. In 2000, the asset-class scene had reversed course, with many "unconventional" assets outperforming the S&P 500. This happy trend continued in 2001.

The graphs shown below continue to reinforce an important point—even during periods when U.S. large market outperforms, a globally diversified asset-class-based strategy will do reasonably well. And when the S&P 500 does not perform well, as it has not these past three years, then the global approach truly shines. Take a look at the current plots for three, five, and ten years, below; but first, for those of you unfamiliar with the cowards, the July 1997 update has a detailed description of these portfolios and the methodology used.







With the reversal in asset-class behavior, the cowards' performance has also reversed: now five- and ten-year performance has slipped, while three-year performance is nothing short of spectacular. And with the revival of value investing in 2000-2001, the academic cowards are looking smarter by the month.

The behavior of each asset class over the past three and five years is shown in the table below:

Index	Index Fund Sampled	3 Yr. Return	5 Yr. Return
Continental Small Companies	DFA Continental Small Co.	-3.40	3.78
Emerging Markets (Equally Weighted)	DFA Emerging Markets	4.28	-3.59
Small Japanese Stocks	DFA Japanese Small Company	-4.89	-14.70
EAFE Index	DFA Large Cap International	1.77	4.21
Pacific Rim Small Companies	DFA Pacific Rim Small Company	11.67	-8.18
U.S. Small-Medium Companies	DFA U.S. Small Cap	13.19	11.19
U.S. Small Companies	DFA U.S. Micro Cap	15.38	11.82
U.K. Small Companies	DFA United Kingdom Small Co.	7.16	2.50
REITs	DFA Real Estate Securities	12.51	7.54
S&P 500	Vanguard 500 Index	-1.06	10.66
Emerging Markets (Cap Weighted)	Vanguard Emerg Mkt Stk Idx	4.37	-4.99
EAFE-Europe	Vanguard European Stock Idx	-5.15	6.44
Precious Metals Stocks	Vanguard Gold & Precious Met	12.20	-3.68
U.S. Growth Stocks	Vanguard Growth Index	-4.46	11.08
EAFE-Pacific	Vanguard Pacific Stock Idx	-4.93	-8.14
U.S. Value Stocks	Vanguard Value Index	1.68	9.35

The dominance of the Tweedy Browne Global strategy continues to annoy the efficient marketeer (because, after all, it is an actively managed fund with a fairly high expense ratio). Tweedy Browne employs a highly diversified, disciplined value strategy which is nation-blind. As such, the authors of "What Has Worked in Investing" and "10 Ways to Beat an Index" seem to be fulfilling their promise. However, their portfolio is hedged and largely European. The hedging is *key*; it gave them approximately an additional 3% of annualized performance over the past five years and 5% additional annualized performance over the past three years. Subtract that from their returns and their advantage disappears. I keep waiting for the currencies to rally, but the market gods have not obliged yet. As Ralph Cramden used to say, "One of these days Alice..."

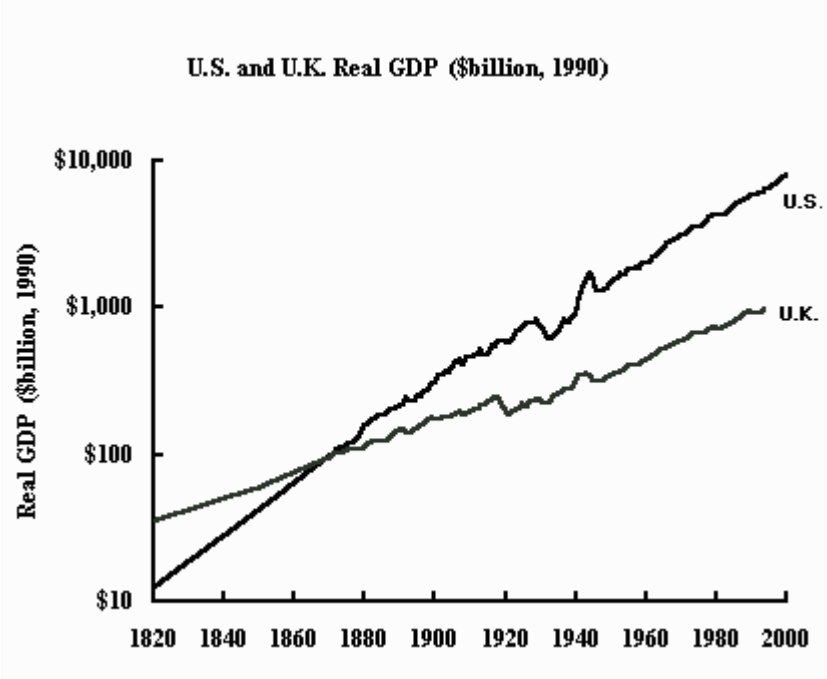
Efficient Frontier

William J. Bernstein

Link of the Month -- Angus Maddison's *The World Economy: A Millennial Perspective*

Anyone concerned with the long-run history of the financial markets cannot help but be interested in the broad sweep of human economic history. Angus Maddison, a Scottish economic historian at the University of Groningen in Holland, has devoted his life to chronicling the world's economic and population growth over the centuries. His output is prodigious, with a staggering list of monographs and academic articles.

His first effort, ***Monitoring the World Economy 1820-1992***, although a cult classic among development economists, suffered from a lack of production and editing effort by the sponsoring organization (Organization for Economic Cooperation and Development). ***The World Economy: A Millennial Perspective*** corrects these deficits and extends the scope almost to the end of the millennium. Want to know the inflation-adjusted growth of GDP or population in Italy from Roman times to the Renaissance? The economic fallout of the Meiji Reformation in Japan? Capital flows in early colonial India? It's all here. A tiny example of the kind of data available from Maddison's tome is shown below, a plot on per-share earnings growth used elsewhere in this issue:



This book is hard to purchase. But if you want to own it, I recommend logging onto its listing at BestBookBuys.com. Alternatively, the most reliable (and expensive) way to buy the book is to it directly from the publisher at the OECD Online Bookshop.

Brad DeLong's eclectic Web site provides an excellent abstract of Maddison's book. At the bottom of the abstract, there is a link to the full pdf. Note that the pdf link is not consistently reliable; it seems to work best with Internet Explorer.

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