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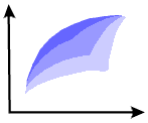

An Online Journal of Practical Asset Allocation

Edited by William J. Bernstein
and Susan F. Sharin

Fall 2003

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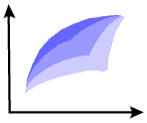

William J. Bernstein

Zvi Bodie and the Keynes' Paradox of Thrift

Most finance writers eventually violate the famous paradox of thrift described by Lord Keynes in the concluding chapter of *The General Theory of Employment, Interest, and Money*. To wit, many virtuous activities, while good for the individual, are bad for society, prime among which is saving—good for the security of the individual, but bad for the overall economy.

I plead as guilty as anyone. While extolling the virtues of indexing, value loading, and rebalancing, I freely admit that if *everyone* indulged, all these techniques would instantly stop working. (This is one of the arguments, in fact, against value investing, since it violates Rekenthaler's Rule: if the bozos know about it, it doesn't work any more. I tend to disagree, since this would have predicted a narrowing of the valuation gap between value and growth stocks during the 1990s publicity surrounding the value effect, and assuredly that did not occur, as growth stocks soared versus value stocks. But that's another article.)

Academician, raconteur, and all-around good guy Zvi Bodie crosses this line in style with a noteworthy new publication, *Worry Free Investing*, assisted by veteran journalist Mike Clowes. The book combines Bodie's nonpareil grasp of the financial markets with Clowes' prose skill, providing solid advice to anyone seeking guidance on retirement saving. Stocks, he points out, are riskier than they seem, with expected returns far lower than the spectacular realized returns of the past seven decades. Investors also need to be cognizant of the covariance of the risks of their investment capital and their human capital. (That is, stockbrokers should own less equity than other investors, since their jobs already provide them with plenty of exposure to market risk.)

The major focus of the volume is Treasury Inflation Protected Securities (TIPS), which insulate investors against the hazards of inflation. So far, so good. TIPS *are* a wonderful asset class, with reasonable expected real returns and near total safety. In fact, when *The Intelligent Asset Allocator* was published in 2000, TIPS were yielding 4%. While I briefly toyed with—and rejected—the idea of an all-TIPS portfolio, I did recommend a healthy allocation to them. Bodie, on the other hand, comes much closer to embracing the idea of an all-TIPS plan, arguing that if an investor has saved enough to retire on, then his primary goal should be to safeguard his real standard of living with these vehicles, or their close cousins, stable-value funds. Yes, Bodie says, you can invest in stocks if you're highly risk tolerant or have more than enough. But TIPS should form the core of your portfolio.

I do have several quibbles with the core-TIPS concept. First and foremost, Bodie's fondness for I-bonds is puzzling in the extreme. Currently, they yield a real 1.1%, and although they are tax-deferred, the owner will find herself taxed on both this yield as well as the underlying inflation component at maturity, making a negative real after-tax return nearly a certainty for most investors. Add to this the all-too-common long-term storage and loss problems with savings *certificates* held by the elderly and other less cognitively intact individuals, and I-bonds rapidly become nonstarters at current rates. An inexpensive tax-managed equity fund would have to see exceptionally poor stock returns to come out behind I-bonds, assuming that the 15% capital gains and dividend rates remain in effect. Finally, your children will find it a lot easier to retrieve your fund account data than those I-bonds you hid between the pages of Grisham novels lying around the house.

Relying on tax-sheltered plain-vanilla TIPS (rather than I-bonds) is not bad advice *for the individual*. But Bodie goes further, both in his book and other forums—*everyone* should be offered, and follow, the TIPS route for retirement. Specifically, investment companies should make available massive amounts of innovative vehicles packaging not only government but corporate and mortgage debt in inflation-protected format for the legions of investors seeking retirement safety and income.

What's wrong with mass-market inflation-protected intermediation? Unfortunately, everything. First, TIPS, while relatively risk-free in the long run, can be rather nasty actors in the short run. As of this writing, the 29-year bond yields a real 2.7%; the 10-year bond, 2.1%; and the 5-year bond, 1.5%. To get those returns, the investor has to be willing to take about 12%, 6%, and 3% of (standard deviation) risk, respectively—not chopped liver, particularly at the long end. Bodie makes the same mistake here as his foils James Glassman and Kevin Hassett, who in *Dow 36,000* postulated a new species of *homo economus* impervious to short-term volatility. At some point in the future, there will be a grinding bear market in TIPS (it may already have begun!), and it is a forgone conclusion that tens of millions of savers will sell out at the bottom, just as they have done historically and repeatedly with stocks.

But there's an even more fundamental problem with TIPS as the national core investment: lack of supply. When investors purchase stocks, they are syndicating corporate investment risk by allowing the companies' owners to offload risk onto them in exchange for a risk premium. In effect, they are acting as companies' insurance agents. With TIPS, the situation is far more complex, but mainly in the opposite direction. Here, it is the *seller* who is assuming risk, indemnifying the *buyer* against the risk of inflation. For the Bodie plan to work, the government, corporations, insurance companies, and mortgage suppliers must be willing to underwrite *trillions* of dollars of inflation-protection risk for retirement savers. Whether this is even feasible is anyone's guess, but what is certain is the price paid by investors for such an amount of protection would be enormous.

Bodie sagely points out that stocks do indeed become more risky with time, the proof of the pudding being that equity puts become more expensive with maturity, and not the other way around. The same, unfortunately, is true of

inflation risk. Similar to stock puts, the nominal yield curve is usually positive, for exactly the same reason: with time, the risk of inflation rises. While one may be reasonably certain that we shall not see hyperinflation in the next five years, one cannot be so sure about the next three decades. Insuring against inflation for the next 30 years is a dandy idea and, at the moment, it is even reasonably cheap. But if demand mushrooms, prices will rise and yields will fall. In an extreme case, negative yields in the secondary market for Treasuries and in the primary non-government markets are entirely possible. (For those having a hard time imagining a negative TIPS yield, imagine what coupon would have been demanded by investors in Germany and Hungary in the 1920s for an inflation-protected investment.)

As pointed out by Rob Arnott and Ann Casscells in the January-February issue of *Financial Analysts Journal*, stocks and bonds are merely a medium of exchange between retirees and workers. (In January, I discussed the Arnott/Casscells argument in these pages.) At any point in time, there are x number of workers producing goods and services for y number of retirees. If there are too many retirees and not enough workers producing goods and services for them, it does not matter how well the retirees have saved in the aggregate—their standard of living will fall as the prices of their securities—TIPS included—deteriorate and the wages of workers rise.

The grim reality is that improvements in intermediation of the sort suggested by Bodie, while helpful, cannot avoid being overwhelmed by the twin bogeymen of human financial nature and demographics. The quantity of long-dated inflation-protected debt required by the mass-market core-TIPS approach is simply not feasible and, even if it were, bond yields would not be adequate to support the retirement needs of the looming wave of boomers.

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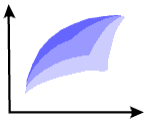

William J. Bernstein

Signal, Noise, and Success

A short while ago, I got an email from one of the brightest journalists I know. He asked for my reply to an analyst who observed:

> *If all these smart guys you quote say investors have to get used to far more modest equity returns for quite a while, that doesn't square with what the S&P, Naz, and Russell 2000 are doing this year.*

My journalist's friend made a startlingly common error of omission: he failed to realize that both expected and realized returns are contaminated by a large amount of noise. Readers of this site know it is just another way of stating the Bogle Partition Theorem—the return of any security or asset class is the sum of its fundamental return (signal) and its speculative return (noise).

Over very short periods, the latter overwhelms the former; only over periods of a decade or greater is the former even vaguely predictive. (For a more formal treatment of this phenomenon, see "Of Risk and Myopia" in the *Efficient Frontier* Winter 2002 issue.) It turns out, however, that the equity risk premium provides a handy back-of-the-envelope way of understanding this phenomenon.

Let's divide the world into equity optimists, who believe that the equity risk premium (which we'll define for discussion purposes as the difference between the stock and T-note returns) is 4%, and the pessimists, who believe it's only 2%. Let's further assume that the volatility, or standard deviation (SD), of stocks is 16%.

At a time horizon of one year, it doesn't matter much whether or not you're an optimist or a pessimist—the 16% noise is so vastly greater than the 4% or 2% premium that *anything* can happen over such a short time period. In other words, the fact that it's 55 degrees outside doesn't tell you whether it's a warm day in December or a cold day in June.

Over longer periods, however, the noise washes out in proportion to the square root of the number of years: the annualized SD is halved at 4 years and quartered at 16 years. I've summarized this for the optimist case below:

Time Period	Risk Premium	SE	Probability of Negative ERP	Probability of ERP>8%
1 Yr	4%	16%	40%	40%
4 Yrs	4%	8%	31%	31%
16 Yrs	4%	4%	16%	16%
64 Yrs	4%	2%	2%	2%

The second column merely reflects that the expected return is the same each and every year, while the third shows how the noise washes out with time. Still, even after 64 years, the SE (standard error, the term for a multi-period SD) is still 2%. This means that a loss is a 2-SE event, the probability of which is still 2%, listed in the fourth column. The fifth column merely demonstrates that the probability of a very good long-term return, defined as an ERP of >8%, is the same as that of a negative ERP.

Here's how things shake out for the pessimists:

Time Period	Risk Premium	SE	Probability of Negative ERP	Probability of ERP>8%
1 Yr	2%	16%	45%	35%
4 Yrs	2%	8%	40%	23%
16 Yrs	2%	4%	31%	7%
64 Yrs	2%	2%	16%	0.13%

At the short end, the numbers aren't that different, reiterating the point that just because it's pleasant outside doesn't tell you what month it is—meaning, just because we've had good stock returns thus far in 2003, as well as in 1998 and 1999, doesn't mean that expected returns are high.

At the long end (64 years), things are different; the pessimists can reasonably foresee a significant probability of a poor result, since a negative ERP is merely a one-SE event, which carries a probability of 16%, while the probability of a good (ERP > 8%) result is a 3-SE event ([8-2]/2).

What have we learned from this disarmingly simple exercise? Two things:

- Over short time periods, noise overwhelms. Anyone making a judgment about security returns, investment strategies, or fund performance based

on data spanning less than ten years should be required by statute to wear a clown's uniform and sandwich board saying, "I slept through Finance 101."

- Even over very long time periods, there are no certainties. Unless securities prices fall dramatically from here, Stocks for the Long Run are no longer a sure thing.

Returning to our weather analogy, if you know that the *average* temperature for the month was 55, you know for certain it was neither December nor June (unless you live, as I do, on the coast of Oregon).

Some might argue that the above methodology ignores mean reversion, which produces actual SE's somewhat smaller than those computed above. Unfortunately, today mean reversion cuts both ways—true, it can be counted upon to lower SE somewhat, but it is just as likely to lower expected return as the valuations of stocks mean revert.

This is not to say that investing in stocks is a bad idea—after all, very few people would argue that the ERP today is negative (although it was relatively easy to make such a case four short years ago). You are still more likely to come out ahead with stocks. It's just they're not a sure thing any more.

The signal/noise paradigm also provides behavioral insight, since it neatly explains the gap between those who succeed and those who do not. No one describes this cleavage better than senior Vanguard exec James Gately:

> *[Successful investors] don't ask us many questions about whether Alan Greenspan will cut interest rates and what that will mean for the stock market. They don't wonder what tension in the Middle East will mean for their portfolios. The headlines aren't driving their decisions.*
>
> *Their questions are much more fundamental or philosophical. We might be asked, "You're offering a lot of new services. Will that raise fund expense ratios?" It's clear that these clients are thinking several years ahead, not about what's going to happen in 2003.*
>
> *Unsuccessful investors, however, are just the opposite. They get caught up in the moment and have a tendency to chase performance. Once a year, I see a friend who hasn't enjoyed as much investment success as he could have. He always asks me about the current "hot fund." I can predict what he's going to ask about by looking at the table of 12-month trailing returns. In 2002, it was the GNMA Fund, which soared as stocks sank. The year before it was something else, and next*

year it will be something else still.

In short, the winners focus on the signal, the losers on the noise. As investors, we all navigate a stormy sea of random market fluctuation. From day to day and year to year, our returns are for the most part stray waves and wind gusts, not omens.

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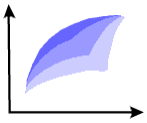


William J. Bernstein

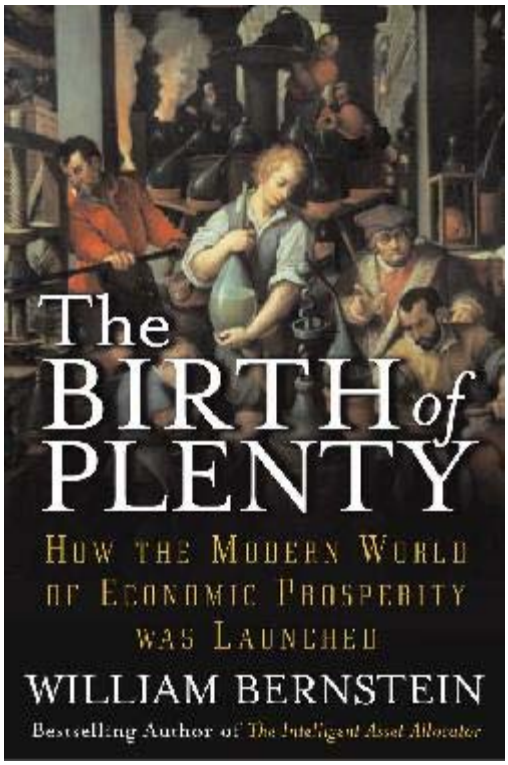
Bigger Than a Breadbox

It's time to let the cat out of the bag. Several years ago, I came across Angus Maddison's epic, *Monitoring the World Economy 1820-1992*, which charted the course of modern world economic growth. This little gem was published in 1995, then sank into obscurity like a stone. And for good reason. The author, while a first-rate economist, possessed the prose ability of . . . a first-rate economist. Further, the story was told largely in tabulated form. And finally, the publisher (The Organization for Economic Cooperation and Development) saddled the layout with an effort that would have made a 1960s doctoral dissertation look slick.

But for those willing to take the time, the story was riveting—before about 1820, the growth of average per-capita world GDP was more or less zero. And after, it was much greater than zero, generally between one and two percent per year. Which may not sound like very much until you realize that this means a doubling of standard of living every generation or two on a planet that had seen no dramatic improvement in the lot of the average inhabitant since the dawn of history.

What happened? More importantly, *why did it happen when it did?* Maddison himself was nearly silent, mentioning improvements in technology and "growth accounts." Most readers found that the book raised more questions than it answered.

For the past two years, I've been plumbing this mystery—The Greatest Story Never Told—and, as a result, shirking my *Efficient Frontier* duties. My humble offering on the topic, entitled *The Birth of Plenty*, attacks the subject from three angles. The first and largest section of the book discusses the prerequisites for prosperity—property rights, scientific rationalism, capital markets, and effective communications and transport. The second section describes how these factors played out in the winners, runners up, and laggards in the global economic sweepstakes. The final section explores their present-day significance.



Since *Efficient Frontier* readers are a "capital-markets" crowd, my publisher, McGraw-Hill, has graciously allowed me to post the parts of Chapter 4 that might interest them. For those who are intrigued, the book is due out in May 2004 and will run about 380 pages. And, if I can continue to jolly McGraw-Hill along, they just might let me publish further excerpts in the Winter and Spring editions.

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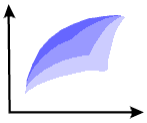

William J. Bernstein

Government and the Birth of Market Capitalism

Manifestly, market capitalism requires *capital*. The engine of the modern Western economy requires fueling by a torrent of other people's money. This flow of capital is a new historical phenomenon; before 1800, the incessant economic growth we have come to expect was in fact unknown in the world. The history of the rise of world prosperity is in large part the history of these capital markets. Even today, governments are among the most voracious consumers of capital, typically for military adventure; in the premodern era, they were virtually the only ones capable of raising large amounts of funds.

The origins of the modern capital markets rested in the military needs of the sixteenth century Dutch Union. Amazingly, Holland was not yet fully independent from the Habsburg Spaniards, against whom they were fighting a brutal war of independence. The special genius of Dutch finance was getting everybody into the act; anyone with a few extra guilders was as liable to purchase government securities as someone today would be to plow savings into a money market or stock mutual fund.

The Dutch provinces and cities ("Holland" existed as a loose confederation of these entities, without a strong central government) issued three kinds of securities. *Obligatien* were short-term notes. These were "bearer bonds" that their owners could readily sell for cash at any time to a bank or broker. *Losrenten* were perpetual annuities, very similar to Venetian *prestiti*. These were not bearer bonds; instead, the holder of the debt recorded his name in a public ledger and received regular interest. They could be sold in the secondary market, and upon the death of the holder passed to his heirs. Last were *lijfrenten*, similar to *losrenten*, except that payments ended with the death of the holder. The yields of these instruments is of note. In the 1570s, the decade *before* the provinces declared their independence, *losrenten* yielded 8.33% in perpetuity. The Dutch do not take the word *perpetuity* lightly: In 1624 a woman by the name of Elsken Jorisdochter invested 1,200 florins in a bond used to finance dike repair paying 6.25%. It was free of all taxes, similar to a modern municipal bond. Handed down to her descendants, about a century later the rate was negotiated down to 2.5%. In 1938, it came into the hands of the New York Stock Exchange, and as late as 1957 it was still being presented for payment of interest at Utrecht.

Lijfrenten, because their interest payments ceased with the death of the holder, required a higher yield—16.67%. The difference between these two rates speaks volumes for European life expectancies at the time. Although the Dutch

financial markets were advanced, they were not sophisticated enough to vary the interest of *lijfrenten* according to the age of the purchaser! By 1609, these rates had fallen to 6.25% and 12.5%, respectively. The cessation of hostilities with Spain in 1647, and the Spanish recognition of Dutch independence the following year had an electric effect on interest rates: not only was the survival of the Republic assured, but its demand for capital was greatly diminished. By 1655, the government could borrow at 4%, a rate of interest not seen since the apogee of the Roman Empire. Finally, in 1671, Johan de Witt, Holland's Grand Pensionary, was one of the first to apply to finance Pascal's new theories of probability, and arrived at a working formula that varied the interest paid on *lijfrenten* to purchasers of different ages.

The Dutch appetite for foreign investing was truly remarkable, even to the modern observer. Dutch foreign investment in 1800 stood at approximately 1.5 billion guilders, or twice its annual GDP. By comparison, U.S. investment abroad is less than half of annual GDP. This highlights the international character of flows of capital from nations with mature economies and excess wealth to those nations requiring it for development. In the seventeenth century, the major axis of flow was from Amsterdam to London, as the English transformed themselves from a backwater into a world power. In the nineteenth century, the by then highly developed English economy became the major source of capital for the developing United States, which in its turn became the major source of capital for the twentieth century's developing nations. And so it goes.

The experience of Dutch finance after 1770 was not at all agreeable. By the end of the Napoleonic War, the world's first mutual funds—aggregations of Dutch loans abroad—traded for about one quarter of their original prices; this is a good indicator of the devastation suffered by Dutch bondholders. The Dutch were once again in the vanguard of another trend in modern finance: the shearing of small investors by the great investment banks. *Plus ça change*. The bonds of foreign nations, many of which would not survive the global conflict no matter which side won, were priced to yield just slightly more than the secure 4% domestic issues—a rotten deal for credulous small investors, but profitable to the underwriters just the same. The recent touting of hyped-up dot-com stocks to a gullible public by mendacious investment bankers would not have surprised the average Dutch investor of 1800.

The reasons for the decline of Dutch financial dominance after 1750 are complex. For starters, Amsterdam never developed the kinds of vigorous central bank and regulatory bodies charged with protecting the investing public that later developed in Britain and the U.S. At the end of the day, the Dutch found themselves overwhelmed by the financial and military colossus slowly rising on the other side of the North Sea, which they themselves had helped build with their capital.

The seventeenth century was less kind to England. For the first half of the century, Parliament and the courts skirmished with the Stuarts—James I and Charles I—culminating in the defeat of the Royalist army by the parliamentary forces at Naseby in 1645 and Charles' beheading in 1649, ending a brutal civil war. Even before this conflict broke out, state finances were shaky. Incredible

as it seems to the modern reader, the English crown, like almost every other European monarchy, possessed no reliable source of funding. A prime source of revenue was the sale of monopolies, as well as the sale and renting of state lands, import and export tariffs, and the like, most of which served to stifle enterprise and trade. English monarchs, like royalty everywhere, were forced to borrow to finance their expensive military adventures. They frequently defaulted, and since it is very difficult to dun a sovereign, interest rates remained relatively high. After the restoration of the Stuart monarchy, this debt grew so large that it became increasingly difficult to service, resulting in the most infamous loan default in all English history: the "Stop of the Exchequer" in 1672, in which Charles II bankrupted much of the banking community that had extended him credit.

The Glorious Revolution of 1688 brought an end to nearly a century of civil strife, and the English "invited" the Dutch stadholder (a most peculiar institution—an appointed, and at times hereditary, ruler) Willem III to assume the British throne as William of Orange. He did not come alone; Holland's financial elite, sensing that Amsterdam's days as the world's financial capital were numbered, followed him across the North Sea. The Portuguese Jews of Amsterdam, having been driven by the Inquisition from Spain to Lisbon to Holland, arrived in London en masse, as did the legendary Barings and Hope families. Abraham Ricardo, father of the economist David Ricardo, was perhaps the best-known of the Portuguese Jewish immigrants.

Dutch ideas came with them; the English enthusiastically copied "Dutch finance," and within a few short decades following the devastating civil strife of the seventeenth century, their capital markets eclipsed those of the Dutch. Naturally, frictions arose. Grumbled Daniel Defoe:

> We blame the King that he relies too much
> On Strangers, Germans, Huguenots, and Dutch
> And seldom does his just affairs of State
> To English Councillors communicate

Things rapidly improved under the new regime. First, the old royal reliance on short-term loans was replaced with Dutch-style long-term government debt whose interest and principal payments were backed by excise taxes. Next, the English Treasury began cooperating with the banking community, experimenting to see which kinds of debt were best received by the investing public (that is, attracted the lowest interest rates). Trust was restored by parliamentary supremacy; the fact that commercial interests were well represented in the House of Commons reduced the likelihood of government default.

Most critically, the English learned how to transfer the cachet of its newly solvent government debt to the riskier capital needs of private companies. In 1697, the Bank of England (a private company until it was nationalized in 1946) pioneered a technique known as "engraftment," in which it assumed government debt. In practice, this meant that private holders of government bills and bonds exchanged them for Bank of England shares. This government debt, now in the hands of the Bank, provided a steady stream of income,

provided collateral for further borrowings, and also informed the Bank of the intentions of further governmental borrowing needs, a valuable stream of information indeed.

Finally, in 1749, Henry Pelham, the Chancellor of the Exchequer, consolidated the confusing array of government loans into a single series of bonds, the famous "consols," which, like *prestiti* and *losrenten*, never matured and provided perpetual interest. They trade London to this day.

Although state borrowing may at first blush seem irrelevant to commercial lending, in fact, a healthy market for government debt is the essential first step for the successful delivery of business capital. The reasons for this are twofold. First, government debt is the simplest to price and sell. Since the mechanisms for the pricing and sale of commercial capital are the same, a successful market for government debt must exist before a commercial debt market can function smoothly. Second, government debt provides an essential benchmark, that of the "risk-free" investment. Government bonds and bills, which trade actively, give businessmen and entrepreneurs a continuous accurate measure of the rate of return demanded by perfectly safe enterprises. This forms a "baseline" to which can be added a "risk premium": the amount of extra interest demanded because of a loan's risk. For example, at the time of Pelham's conversion, consols yielded 3%, the lowest possible rate available to that most reliable of borrowers, the government. Thus, a moderately risky commercial venture might require a 6% rate, and a speculative one, in excess of 10%. The presence of an easily observable risk-free rate makes it easier to price and sell commercial capital.

In the U.S. as well, the establishment of a large and liquid market for government bonds helped smooth the way for the capitalization of private needs. In 1862, when Lincoln's treasury secretary, Salmon P. Chase, failed to float a $500 million war issue, he called on Jay Cooke for help. The well-known Philadelphia investment banker used the newly invented telegraph to deploy an army of 2,500 agents to sell the bonds directly to the public; he floated an even larger issue just before the war ended. Beginning in 1870, Cooke used the same techniques to raise capital for the Pennsylvania Railroad. His method split the task between two groups. The first constituted the underwriters, who purchased a company's debt at a discount; they bore the risk of being left with a large amount of unmarketable securities in the event that sales should fail. The second group was the large number of distributors who sold the issue directly to the public. In this manner were the vast capital needs of the new nation met.

Today's mullahs of market fundamentalism blandish the pre-1900 era as one of blessed unfettered capitalism; nothing could be further from the truth. The vigorous modern culture of stock and bond investing required vigorous premodern jumpstarts from strong government institutions. Today, as in the past, the inevitable costs and inefficiencies of government supervision of capital flows are almost always outweighed by the resultant transparency and trust.

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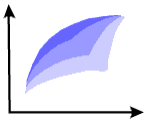

William J. Bernstein

Link of the Month: Luigi and Raghuram Do It Again

Few academic economists possess the historical eye and dab prose hand of Luigi Zingales and Raghuram Rajan. In a preliminary version of a paper about to appear in the *Journal of Financial Economics*, this erstwhile pair tests an abstruse model of the interaction of financial and trade openness in national economies. Their model is opaque and its conclusions, far from clear-cut.

No matter. The last quarter of the piece's text—roughly pages 29 through 40—provides a beautiful overview of the economic history of the twentieth century with particular emphasis on the differences between common law nations (roughly, the U.S. and Great Britain) and civil law nations (just as roughly, everyone else). If you've ever wondered just why the twentieth century was such a pistol or why the French body politic and economy don't look like ours, you'll find it all here.

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