



Practical Pensees

By

Joel C. Gibbons
Logistic Research & Trading Co., Inc.
St. Joseph, Michigan, 49085

July 5, 2003

Preface.

These are a set of essays that I composed over a period of two years, and which were intended originally as promotional material for my trading firm, Logistic Research & Trading Co. They cover a wide range of topics, chosen idiosyncratically and largely without forethought, but for the most part they deal with topics of then-current interest in financial markets. The monthly publications of which they were a part also had a short section on investment strategy, which was of course more timely, and more specific to the needs of an investor or trader.

I have not made any attempt to revise or update these pieces, but have left them in their original form. The reason for this reserve is not a lack of interest in the topics or a loss of commitment to quantitative research. The reason is simply that I have found, as have most authors who have had occasion to re-release old works of theirs, that the pieces must either stand or fall on their own. They represent pretty accurately what I thought about these topics at the time, and I will have to live with that.

Many persons have helped with these essays, both when they appeared originally and later, with the task of compiling them into this book and with further editing. I should mention especially Marcus A. Gibbons and Hugh Gibbons.

We here at Logistic hope that you will read and enjoy this work as much as we have enjoyed its creation. We are a trading house where all decisions stand on two sturdy legs. One leg is information and data. Never before in history has so much data been available, and indeed readily available, to inform and guide decisions of all sorts. The other leg is scientific research grounded in common sense.

Our goal has always been to use research to let the information and data speak: to give the real world its voice,

without interposing our prejudices. As much as we all love and are committed to the elaboration of scientific theories, the bedrock of science must always be the truth that the facts speak for themselves. The job of the scientist is to turn the merest whisper into a mighty roar that all can hear.

Contents:

1. The Yen Problem	p. 4.
2. Good News for Individual Investors	p. 8.
3. Unmanaged Futures	p. 12.
4. The Wealth Tax on Bonds	p. 16.
5. Energy in Abundance	p. 20.
6. Novus Ordo Saeculorum	p. 24.
7. Is Life Fattening?	p. 28.
8. As Cautious as Croesus	p. 32.
9. Money Ssupply	p. 37.
10. Urban Landscape: Not a Still Life	p. 42.
11. In Search of the Golden Cat	p. 47.
12. Guided Tour of the Logistic Model	p. 52.
13. Guided Tour of the Logistic Model, Part 2	p. 58.
14. Energy Futures	p. 60.
15. Capitalism and Freedom	p. 64.
16. Prices Vary	p. 69.
17. Investments and Financial Services	p. 74.
18. Power Politics	p. 78.
19. Lord Keynes Goes West	p. 83.
20. Why I Would Tax Capital Gains	p. 88.
21. <i>E Pluribus Unum</i>	p. 93.

The Yen Problem

I have to admit that I have come down with the usual Yen problem -- I don't have enough. My guess is that most of the audience has a similar problem. This situation, which is by no means new with me, is compounded now by the fact that the dollars which I do have don't fetch nearly as many Yen as they used to, so it has gotten harder than ever to take corrective action. I mention all of this as a way of emphasizing that some problems are awfully easy to understand. The causes and consequences of exchange rate adjustments are not so self evident, and are being misinterpreted as weakness of the dollar. The problem is really the far more intractable strength of the Yen.

Background

The most immediate question is: what is going on? We naturally look first at our own economy. There is no ready reason why the dollar should be dropping in value. The American economy is booming, which suggests that the U.S. is a good place to buy things, and that naturally creates a demand for dollars with which to effect transactions. But the domestic money supply has by no means been excessive.

If anything, the results of the last four years depict an economy comparatively starved for money. The good news is that rather than caving in to the pressure to monetize transactions and "stimulate" the economy, the Federal Reserve Board chose to hang tough and rely on price flexibility to restore the price system to its proper function. If any sequence of events could drive a final stake through the heart of so-called Keynesian economic policy management, it would have to be the record of the last six years. Charming Evanston, Illinois is probably the only remaining outpost of Transylvanian economics in North America.

As recently as the third quarter of 1990, the inflation rate was running around 6%, short term interest rates were about 300 basis points higher than today, earnings of the S&P 500 were falling, and the price/earnings multiple of the S&P 500 was around 14. Four years of tight money have left us with rates at 4% and S&P earnings about 50% higher -- though the multiple is back to the same neighborhood. And for the first time since the banking crisis exploded in the middle of the federal budget, the deficit is falling and we have again a chance to grow our way out of debt. Only last week, OMB revised estimated deficits for '94 and '95 down by a total of about \$10 billion.

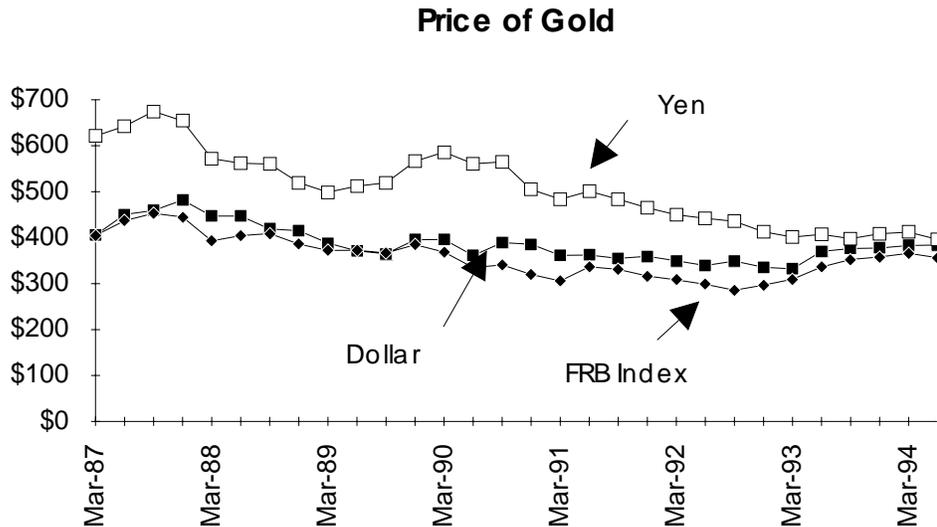
The only cloud visible on the financial horizon, the prolonged rapid growth of the monetary base, can and almost surely will be addressed as the banking system returns to normalcy, and that has happened. The base grew at about a 10% annual rate between

November, 1989 and November, 1993. The annual rate since then has fallen back to around 8%, and recently has run at 6%. The long term average, for purposes of comparison, is about 5.5%. This is especially reassuring because it faithfully follows the Greenspan script from last autumn, in which he patiently explained the necessity of higher short term rates to prevent overheating.

It is clear that we have to look elsewhere for an explanation of what is going on.

Are the markets watching?

One market at least is looking, and seeing very clearly what is going on. As so often happens when the question turns to currency valuations, the gold market provides the essential perspective, and what it says is that the dollar is not falling; the Yen is advancing. The graph



below depicts the performance of three “currencies” -- stated as the price of one troy oz. of gold in each of them -- since the beginning of 1987. A high price of gold corresponds to a weak currency, so the overall tendency of all these prices to fall over time implies that gold has been the weakest currency of the lot. The units require a little explanation. The Yen price of gold is the price in Y100; to get the price in Yen, simply multiply by 100. The price of gold in terms of the FRB Dollar Index treats the index as a currency, using the index value as the exchange rate. Currently, one US dollar is worth about nine-tenths of an index unit (90 “Index cents”). The FRB Index reflects the relative value of the dollar in terms of a broad basket of foreign currencies.

This graph expresses several interesting facts. The FRB Index, for instance, has been the worst performer of the four currencies since the middle of 1992, as a result of stimulative monetary policy in many of our trading partners. Canada and Germany stand out in this regard. Even though the dollar was hit hard in the second quarter of 1993, it

has still significantly outperformed the FRB Index over the last two years. Thus, the dollar could not by any means be described as a weak currency. It has done as well as any other in trying to keep up with the Yen, but that has turned out to be an impossible task. The Yen has rallied by almost 40% relative to the lows reached in mid-1987. At the low of the Yen, one ounce of gold cost around Y67,500, and it now costs less than Y40,000. The gold market is watching, and what it has been seeing in Japan is a draconian deflationary monetary policy.

Cui Bono?

Japanese monetary policy raises some very difficult questions for the rest of the world, and especially for the United States, which takes seriously its role *in loco parentis* to the world. These questions would become moot, however, if the underlying policy was to change. It is most pertinent therefore to ask whether Japanese monetary policy is an aberration or is intentional. Skeptics that we are, investors naturally want to know if Japanese leaders find tight money beneficial to themselves. If they do, they may be somewhat reluctant to change.

Money and trade

The Great Depression, which freighted the world with all manner of intellectual baggage, stays with us in the idea of competitive devaluation of currencies. The idea could be described as simplicity itself: if a nation's capital and labor are putting themselves out of business by setting their wages too high, the monetary authorities could simply mark wages down in world commerce by devaluing the currency. The supposed advantage of this gambit is that the government could bring this about -- lowering the wages of both capital and labor -- quietly and unilaterally. Sixty years ago, competitive devaluation failed because it ignited a trade war which brought down the world economy; no industrialized nation was willing to undergo competitive revaluation, even though it would be a boon to the general public.

Nonetheless, competitive devaluation made some sense in the context of the economies of that time. The industrialization at that time was predicated on volume: the volume of output of fairly standard and homogeneous products. Every nation had its mill district, and when business was slack the job was to get the mills running again. Since the mills of all nations produced fairly similar products, the best way to achieve that was to slash prices. The mills of any single country depended on ties of various sorts to other producers -- the most important tie being their dependence on imports of raw materials from economically backward regions (both foreign and domestic) -- but the national interest was pretty nearly synonymous with the interests of the mill owner and his workers.

Both money and trade work very differently in today's integrating world economy, and the mill owners and the mill workers of a nation no longer have the dominant voice in its economic policy. The biggest change is that a nation's currency is now an asset. Not an asset of the country or its monetary authorities, who can always

make more, but an asset of institutions which ultimately count their gains and losses in that currency. The great beneficiary of a rising Yen are Japanese corporations -- especially banks -- which mark their assets to market in Yen.

To a large extent, this is nothing more than a wealth transfer to Japanese corporations, extracted primarily from the Japanese public. But it also has potentially lasting consequences for other economies. Unlike the mills of yesteryear, the modern corporation is integrated internationally because it must own productive assets in many places. This is true of its production activities, which are scattered around the world to take advantage of the comparative advantages of different localities, and it is true of distribution outlets as well. Facilities for promotion and distribution, which are inherently local, are a critical part of the corporate activities. These kinds of business investments all around the world have gotten more expensive in dollars and less expensive in Yen. As a consequence, expansion of Japanese corporations -- corporations which must ultimately mark their assets to Yen -- is promoted and expansion of American corporations is retarded. Taken to the extreme, a strong Yen would cause American business to sell its overseas assets to Japanese business in order to capture the gains in dollars.

Cui Bono? Who benefits? Japanese multinationals, especially banks, benefit; American and other multinationals are disadvantaged. Why banks? Because they have the largest Yen balance sheets.

Tight money also promotes Japan's trade surplus, despite its effect on exchange rates. The reason is clear: tight money keeps Japan in a persistent recession which discourages imports and encourages exports. This results in a vast and dangerous contradiction: from their point of view, the Japanese people perceive themselves to be poor and struggling to make a living, while the rest of the world sees Japan as rich and increasingly dominant in the Far East.

This contradiction will eventually spell trouble for the world economy, because the developed economies will not accept this sort of exploitation indefinitely.

Good News for Individual Investors

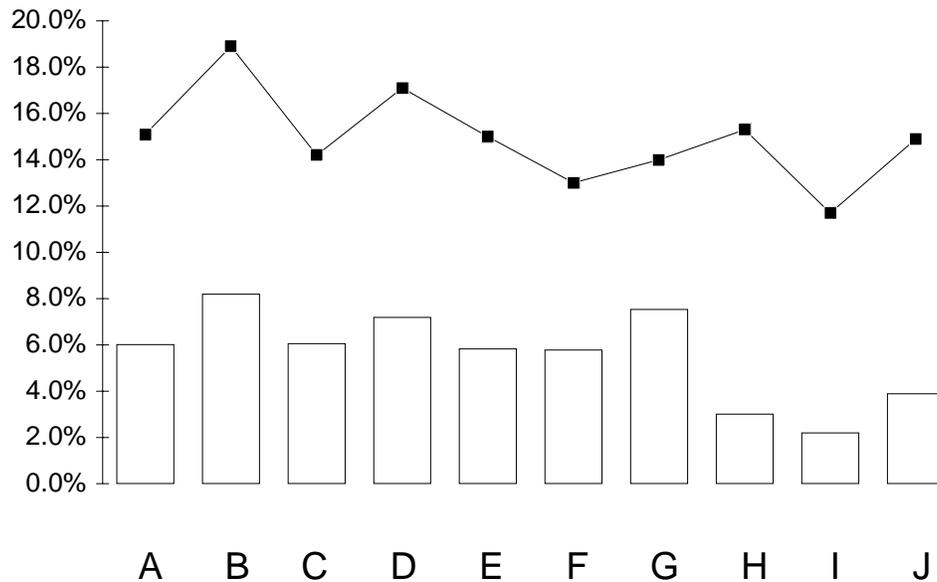
The Federal Reserve Board publishes a very interesting, and widely followed, analysis of investment flows from the point of view of investors. Like everyone else, we generally focus on the most recent flows, which are indeed interesting. As usually happens with statistics, however, there is also much that can only be discovered from the entire history. One of the many things which emerges from the broader view is a comparison of the relative investment performance of different classes of investors. What results is some very good news for individual investors, and since that category includes everyone, the story makes good reading.

The Forgotten Individual.

The term “individual investor” does not ordinarily conjure up images of titans of Wall Street. In fact, the term could best be described as derisive. Among the indignities which have been heaped on the men and women from Main Street is to have become the target of contrarian technical signals for equity trading. Odd lot buying, as we all know, is a widely accepted signal to sell, and odd lot selling a signal to buy. The Federal Reserve data, by contrast, show individual investors -- a class which the Fed refers to as households -- to be doing a pretty good job at looking out for their interests. The same data covers a number of other investor classes as well and thus provides some basis for comparisons among them.

The most natural question is how has the individual investor been doing, compared with the market as a whole and compared with other narrow categories of investors. The answer is that they’ve done pretty well in terms of total return, though not so well in terms of variability of returns. The average annual rate of returns of investor classes are shown in the graph below, and standard deviations of annual returns are shown in the second graph. The investor classes are simply identified by letters, A through J, on the charts. A table which translates the letters into descriptions of the categories appears beneath the graph. The individual, or household, category are identified as category B, and includes personal trusts (generally wills and estates), and some tax exempt foundations. Category C is a broad group referred to as “all institutional,” and consists of the whole market minus individuals. Categories D through J are, therefore, various parts of this institutional category C. It is quite remarkable how heterogeneous these parts are.

Rates of Return: averages and standard Deviations



<u>Investor</u>	<u>Description</u>
A	S&P 500 price return
B	Households, personal trusts, and some foundations
C	All institutional funds
D	Mutual funds
E	Foreign investors
F	Broker/dealer proprietary investments
G	Private pension funds
H	Public pension funds
I	Life insurance reserves
J	Other insurance reserves

The chart above displays performance statistics -- based on annual returns from 1969 through 1993 -- for nine classes of investors and for the S&P 500 index. The bars represent mean rates of return, while the plot above the bars represents the annual standard deviation of return. Returns are price returns only, excluding dividends.

Individual investor as a group stand out against institutional investors both for having higher returns on average -- about 8% per year for individuals versus 6% for institutions -- and for having higher variability of returns. The standard deviation of rates of return for individual funds as a whole was around 19% per year, compared with 14% for institutional money. These statistics relate to these categories of investors as a whole, and not specifically to the average member of the group. The variability of outcomes of any group is much less than that of the representative member of that group, because of diversification over the group. Thus it is very apparent that the typical individual investor experiences, and is presumably satisfied with, a high degree of variability of returns from year to year.

Two classes of institutional investors had price returns ahead of the S&P 500: mutual funds and private pensions. Mutual funds, category D on the chart, resemble individuals though in a somewhat scaled down fashion; they have had above average

returns and even as a group relatively high return variability. Private pension funds, category H, have both above-market returns and below-market variability, which is quite an achievement. The last three categories, public pension funds, life insurance reserves, and other insurance reserves, appear to have lagged rather badly.

Among them, life insurance -- category I -- stands out as being in many ways the mirror image of the individual. This is surprising because life insurance companies, like mutual funds, are really surrogates for the individual; that is to say, they are retail alternatives to self-directed investing by individuals. It is possible that life insurance companies adopt the role of a diversifying asset for the individual, but if so, it is very high cost diversification.

Differing Investment Styles.

Judging from the evidence in the graph above, individuals have acquitted themselves reasonably well in comparison with other institutional investors. But it is fair to ask how much of the individuals' performance advantage came from a higher risk investment policy, and how much came from superior cunning and insight. The high variance of returns earned by the universe of individual investors bespeaks an aggressive investment style, and this impression is borne out by simple market correlations. Individual investors as a group had a market *beta* larger than 1.2. For a universe as large and diversified as this -- so that it is hard for the group as a whole to deviate appreciably from the whole market -- that is very high. The difference of .2 between the household portfolio and the market portfolio explains about 1.2% of the 2.2% difference in rates of return. (Obtained by multiplying the market return of 6% by 1.2. The result simply equals the rate of return one would have expected from market exposure alone.) A large part of the households' investment performance, therefore, comes from exposure to the market, and this represents a very clear and strong style preference of households as a group. It points to a style with a strong growth orientation, which comes from an overweighting in small, relatively immature companies.

The remaining 1% of performance is presumably a true market alpha. The alternative -- that it comes from leverage -- is ruled out by the same model which provides the beta estimate. One should not leap to the conclusion that **individuals on average** beat the market. That is not a reasonable inference from this data, because it is not the **typical** individual who seems to beat the market. It is, rather, the category as a whole which does, and the category is a diversified portfolio of all the individual investors in the country. None-the-less, the typical individual could hardly be sharply lagging the market, as the following argument demonstrates. The category of individual equity portfolios can outperform the typical member only to the extent of the diversity across household portfolios. The common style bias -- growth -- of the whole category necessarily forces the individual portfolios to be rather similar to each other, and thus limits the size of the "diversification effect" across individuals.

It seems fair to conclude from these statistics that individual investors do a creditable job of investing, given their particular objectives and resulting style bias. The apparent *alpha* of the group of individual investors is about in the middle, among *alphas* of the other categories. The highest measured *alpha*, and incidentally the only one which would be statistically significant, is for private pension funds. Their style tilt seems, by contrast with individuals, to lean toward mature, leveraged companies which have comparatively low market *betas*.

The style tilt of individual investors explains one of the mysteries of the flow of funds data: the steady net sales of stock by individuals. According to the flow of funds data, the “individual” category was a net seller of stock in every single year from 1969 to the present. The rate of sales peaked at over \$100 billion per year in the late 1980’s, and is presently running at close to an historical low. Even in recent years, though, individuals have been sellers of stock. The mystery is when will individuals run out of stock to sell. The answer is, of course, never: thanks to the higher rate of return that individuals achieve, they need to prune equity positions regularly to restrain their growth in the total portfolio of securities. As an illustration of this, at the end of 1978, equities represented about 20% of the portfolio of individual portfolios. By the end of 1993, that had grown to 23%. Even after sales of stock, the individual sector accumulated stock faster than it accumulated financial assets as a whole.

While it is not true that individuals have withdrawn from the equity market, it is true that they represent a smaller share of the equity market than they did formerly. Sales of existing stocks out of individual portfolios and into institutional portfolios would only about offset the difference in their rates of return. Over time, this process would only have prevented the share represented by individuals from growing faster than institutions. Along with this trend, however, is that fact that new saving are increasingly channeled through institutional vehicles, with mutual funds being an important example of this. The net new funds invested through institutional vehicles have, roughly speaking, corresponded to net issuance of new stock.

It is interesting to speculate why individuals have increasingly chosen to shift the job of managing equity portfolios to institutional investors. No doubt some of this has to do with the tax preference for tax qualified retirement plans. More speculatively, perhaps, one might ask whether it signals a maturation of corporate America, whose equity shares therefore increasingly resemble the kind of stock which institutional investors have historically had the most success with.

Unmanaged Futures

Some days I think I am managing my future, and other days I think my future is managing me. It's hard to know which of us is gaining the upper hand, because the future doesn't actually exist yet. I suppose one should be content with those victories gained managing the present, which does exist. Investments, however, are a unique business in that, in a sense, the future is everything. The only thing anyone can do after putting an investment program together is to wait. It's a little like the process of aging fine wine, in which the calendar and an initial supply of new wine are the only essential factors of production.

This essay is not, however, a defense of the virtue of patience. Quite the contrary, it is an unabashed advertisement for actively managed futures. Futures and options strategies in any form entail a large and often unavoidable element degree of risk. But *without* hands-on active management, the risk can grow exponentially without any commensurate improvement in return expectations.

Land Mines on the Balance Sheet.

For more than a year the term "Derivative Instrument" has seemingly been synonymous with Land Mine, as one investor after another has been forced to recognize in public sizable losses on derivatives of mortgage-backed securities. A short, anatomical study of these losses is revealing.

This sort of derivative instrument carries with it several layers of risk. The initial layer is that its value depends on how homeowners will respond as mortgage rates rise and fall. This layer is widely understood, at least at a conceptual level. As mortgage rates fall, along with other interest rates, homeowners will be more inclined to refinance their mortgages. The party which receives the cash flows from mortgage servicing finds itself not earning the stated coupon, but reinvesting the entire remaining principal at the lower prevailing interest rates. This explanation seems to define an asymmetrical risk -- the risk of accelerated payment -- but the risk is actually symmetrical. The owner of the mortgage-backed bond figures on some rate of paydowns when it buys the security. If paydowns cease precisely when the rates on new securities have gotten more attractive, the owner of the bond loses the reinvestment opportunity. This layer of risk, accordingly, comes from uncertainty about where interest rates, and especially mortgage rates, will range over the life of the security.

The next layer is uncertainty about how homeowners will adapt to changing mortgage rates. Because of the size of the market in securitized mortgages, vast resources of time and talent have been expended to make precise the linkage between mortgage rates and prepayment rates of mortgages. The extent of the risk from interest rates -- the initial layer of risk -- is itself highly dependent on the elasticity of homeowner response to mortgage rates. If they are highly responsive, the risk is large, while if homeowners are insensitive to refinancing opportunities, it is small. This is not the risk that interest rates will vary, because we already counted that risk. It is the prospect that we may not know how large that risk is. The only way one can manage that risk, which is often referred to as "modeling risk," is to do more and better studies of the behavior of mortgage prepayment rates. Despite the best available work of this kind, over the last several years' prepayment rates proved to be far more elastic in response to mortgage rates than anyone anticipated.

There is also a third, and final, layer, which tends not only to exacerbate the variability of performance of these securities, but it also does that at precisely the worst times. It comes from the highly variable confidence which investors place in the ability to manage risk. However much mortgage rates vary, as long as actual prepayment experience falls in line with expectations, investors will rightly judge that they are in a position to manage their interest rate risk. Should the models diverge from real experience, however, most people will naturally begin to doubt them, and this leads to a snowballing loss of confidence in any attempt to assess risk. The one thing that is sure to happen in this case is that the value of the security will fall, because it has become more risky. The extent of the fall, moreover, is hard to predict for precisely the same reason: investors doubt their ability to evaluate the extent of risk.

Caesar's wife, the story relates, was held to the double standard: she had to be virtuous and she also had to appear to be virtuous. Risk, like Caesar's wife, must adhere to a double standard, and the standard of appearances is always the more demanding. If the investor can not have confidence in his own assessment of investment risk, his only fallback position is to try to quantify a kind of worst case: the pertinent question becomes what risk premium is generous enough to entice a wary buyer to step forward. When the public loses confidence in its ability to attach a rational price to a security, it is left groping for a bottom.

Timely Hedging.

There is no way to make securities of this sort risk free, but there are ways to mitigate the risk. The institutions which experienced the most embarrassing performance problems were those that engaged in *unmanaged derivatives*; they bought this kind of instrument and, roughly speaking, stuck it in the drawer. I will use a concrete example generated by our option-valuation systems to illustrate the difference between unmanaged derivatives and actively hedged derivatives.

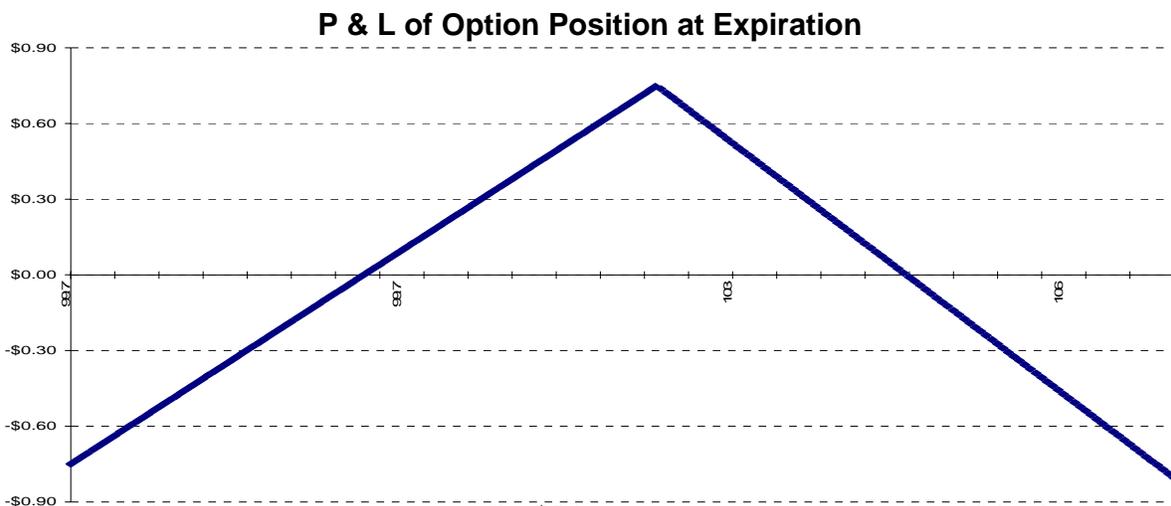
The dicey part of mortgage derivatives comes from a combination of options and leverage which are embedded in them, so a good place to start is with a fairly simple option position, consisting of a hedged sale of both put and call options on ten year notes. On September 21st, the December note contract settled at 101 22/32, with 58 days to expiration. The option position -- called a straddle -- looks like the following:

Sell 33 Call options at a strike of \$102
proceeds, @ 1+5/64 per contract = \$35,600.

Sell 28 Put contracts at a strike of \$102
proceeds, @ 1+25/64 per contract = \$38,900.

Total proceeds = \$74,500

The best possible outcome if this position is held to expiration, in 58 days, is that the note will be priced at \$102, and both options will expire worthless, leaving the entire \$74,500 as profit. The graph below shows a wide range of other, less pleasant outcomes, in which the note closes in a range from \$99 22/32 to \$106 22/32 -- i.e. up or down \$5. The graph shows the net value of the position on the expiration date, including the initial take-out of about \$75 thousand. The position closes with a net gain if, on November 18, the note is priced somewhere between \$99.33 and \$103.28. Larger changes in the note, either up or down, result in a net loss at expiration.



If the note contract was to rally \$5 between now and November 19th, the option position would expire with a net loss of about \$79.7 thousand, because although the put options would be worthless, the call options -- which were sold short -- would be worth about \$154 thousand. This chart depicts the risks and rewards of an unmanaged position held to maturity.

Suppose instead of this buy-and-hold rule, the option position was reweighted periodically as the Treasury note moved. The rationale for reweighting is simply that even though the original straddle is duration-hedged -- which means that its value is not sensitive to small changes in the Treasury note -- as the note moves the hedge is lost.

Taking the particular case of a rally in Treasury notes, as the note rallies the straddle acquires a negative duration, and consequently falls in value. The purpose of reweighting is to restore the hedge at a zero duration.

It is possible, and in a world without trading commissions and other transactions costs it would be ideal, to reweight the straddle daily or even minute-by-minute. In practice that is far from ideal. A much simpler and less strenuous rule will suffice, in any case, to illustrate the value of reweighting. If the note rallies by \$5, as the graph shows, the original straddle would suffer a loss of almost \$80 thousand; this is the right-hand end point on the graph. Now suppose that the way this happened is that the note first rallied \$2.50 between September 21st and October 21st, and rallied another \$2.50 between then and the expiration date. To restore the hedge in October, one would purchase 28 call options, at a price of around \$2.89 each. This price is based on the price of calls today, adjusted both for time decay between now and October 21st and for the note \$2.50 higher -- at \$103 6/32.

The profit and loss statement for this trading rule yields something dramatically different than a loss of \$80 thousand.

P and L for the initial straddle:

Sept 21	Proceeds of sale of options	=	\$74,500
Nov 19	Terminal value of options positions		
	puts	=	\$0
	calls	=	(\$154,200)
	Net P & L	=	(\$79,700)

P and L for reweighting

Oct 21	Purchase of 28 calls	=	(\$80,900)
Nov 19	Terminal value of these calls	=	\$146,500
	Net P & L after rehedging	=	(\$14,000)

The gain of about \$65 thousand on the options bought in October reduces the net loss from almost \$80 thousand to about \$14 thousand.

The reason for actively managing a derivative position is to control risk: by trimming back the extremes of the distribution of outcomes. It is not in itself a profitable activity; it is an inherently passive action designed to steer the characteristics of a derivative back to where they started, whether that is to be fully duration hedged, as in the example, or something else. The difference is risk management, and as this simple example has shown, the difference can be very large.

The Wealth Tax on Bonds

It will come as no surprise that the rate of return on bonds has been very meager for at least the last fifty years. Many years, the coupon flow from both corporate and Treasury bonds has not been sufficient to maintain the purchasing power of a bond portfolio, and for a taxable investor, the returns have been significantly worse than that.

Marx on Bonds: maybe we should hope that Marx was right.

Karl Marx died about a century ago, though it took a hundred years to bury the remains. It is not appropriate for any of us to play Marc Anthony -- and Marx was certainly no Caesar -- because he lies now buried forever in the wilderness of Siberia. There is no life beyond the Stalinist grave. One of the building blocks of his world view, however, was a theory of how to exploit capitalists, and that is an idea which merits some attention even now.

The Marxian thesis, which goes under the name of the Labor Theory of Value, has many ramifications, but at heart simply asserts that there is no lower limit to the rate of return on capital. The reason alleged -- the “proof” so-to-speak -- for this law is the observation that capitalists *have* to save and invest, no matter how poor the returns are. The only socially approved alternative available to a capitalist is to distribute his or her money to the poor and become a mendicant friar or nun. That is to say, the money isn’t good for anything except saving and investing. In practice, capitalists who desire to escape the demands of their calling generally prefer conspicuous consumption and riotous living to self-abnegation as the route of escape from the burdens of the capitalist way of life. But most capitalists are dedicated careerist who really would rather continue to be capitalists a little longer.

The Marxian theory seems to be eminently logical in a highly stratified society in which capitalists are a distinct, readily identifiable, privileged caste. Its chief implication is that capitalists would settle for no return at all on their capital. Lord Keynes was quick to see the practical implications of this theory. The implication of Keynesian economics which so outraged a generation of conservatives was that the government should use its influence on the economy to bring about a low rate of return on capital by transferring income from capitalists to everyone else. The Keynesian proposal had a further ingenious twist: it asserted that since the general public would proceed to spend the money to buy

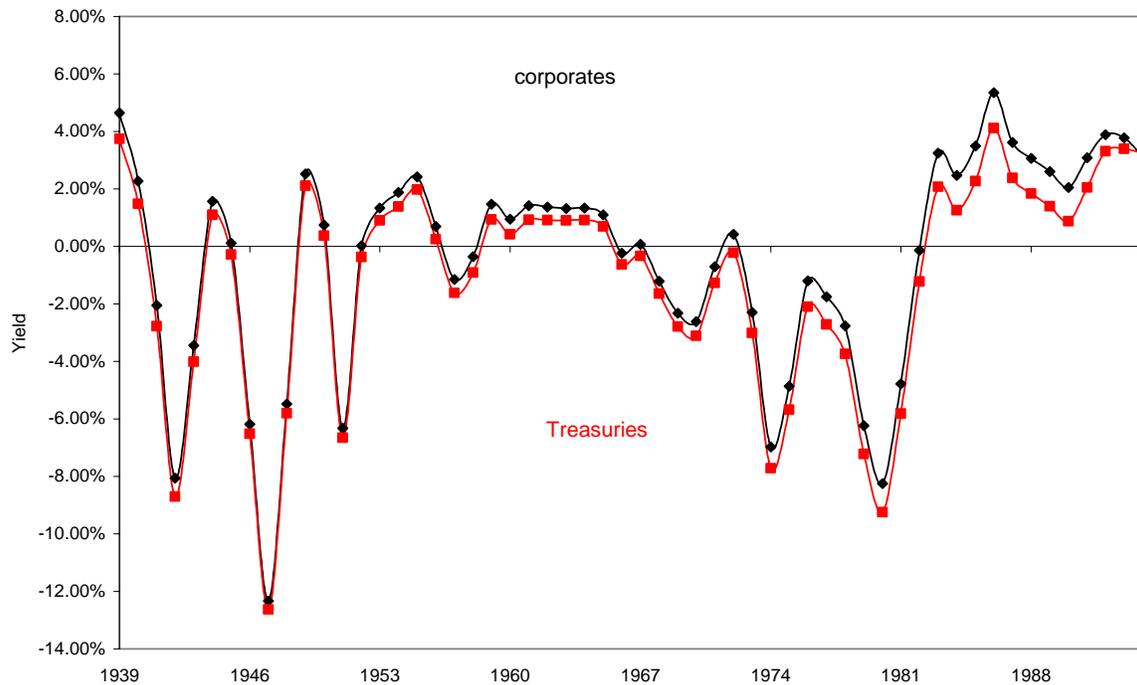
goods produced by these same capitalists, the money would in the end come back to them anyway! Keynesianism was at heart a giant make-work boondoggle for capital.

It remains to be seen how well this policy will work in the long run. The record on rates of returns on bonds documents very clearly, however, how firmly we as a nation committed ourselves in the past to making it work.

Bond Returns.

There are two different, though not antithetical, ways to measure the rate of return on bonds. One approach uses prices of a representative universe of bonds and calculates holding period returns, in a manner which is entirely analogous to returns on any other asset. The other way is to track the coupon stream from a representative portfolio of bonds. This second method, which I have used here, has the advantage of being comparatively simple to track, and at the same time of corresponding to a plausible buy-and-hold policy. The portfolios are simple laddered portfolios, consisting of bonds which had initially twenty years to maturity. I assume that each portfolio would have grown at a steady 5% rate per year, reflecting growth of the economy, so the average age of bonds is actually less than ten years.

**Historical Yields on Corporate and Treasury Bonds
After Inflation**



Sources: Treasury yields: Federal Reserve Long Treasury Index
Corporate yields: Moody's Investment Grade Industrial Index
Inflation: Consumer Price Index.

Since the coupon flow from a bond portfolio is always positive, the nominal rate of return is positive every year. Real returns can easily be negative, though. Each year the investor receives coupons and maturities on his existing portfolio. With these, the investor has to buy bonds in order to have a continuing income in the future, and if the costs of living is rising, he would need to increase his income just to stay even in purchasing power terms. The investor will fall behind in real terms any time he or she is unable to raise the average coupon *on the whole portfolio* as fast as the cost of living has gone up.

The graph shows real returns on two portfolios -- a portfolio of long investment-grade corporates and a portfolio of long Treasuries -- over the period from 1939 to the present. The rate of return each year is simply equal to the average yield of the portfolio, minus the rate of inflation in that year. Each portfolio consists of bonds which have between one and twenty years remaining to maturity. I assume that the Treasury bonds are not callable, so the average age of bonds in the Treasury bonds is constant. For corporate bonds, call options are too important feature to simply ignore. I have assumed that corporate bonds can be called any time after ten years, and are called at the first subsequent date that the call option is in the money. While certainly a vast simplification, it at least captures the basic features of the call option. As a result of calls, the average age of bonds in the corporate portfolio is variable, falling whenever yields of new issue corporate bonds decline. Because of the exercise of the call option this year, the average yield of the corporate bond portfolio actually fell below that of Treasuries this year.

Taxes and Returns.

Two observations positively leap off the graph. The first is that the rate of return on both corporate and government bonds has been very low for the last 55 years. The average real return on the Treasury portfolio has averaged around 30 basis points per year, and the real return on the corporate bonds has averaged around 125 basis points. Out of the average coupon of 5.6% on corporate bonds, the investor would have to reinvest about 4.3% (i.e. 5.6% minus 1.25%) to maintain the purchasing power of the coupon flow. The 125 basis point would then be available to spend.

The other inescapable conclusion is that *war* is the bane of fixed income investors. This is hardly surprising, because wars are very expensive and cause the public treasury to cut corners in order to make ends meet. The worst year for bonds, interestingly, was 1947, when post-war inflation caught up with bond portfolios yielding around 3%. The aftermath of the war in Viet Nam, coupled with the war on poverty, was also costly to bondholders, though no single year was as painful as the immediate post war years. There is a sad irony in the correlation between real rates of return on bonds, on the one hand, and real shooting wars. It is that the very purpose for exploiting capitalists - - as advocated by Keynes -- was to improve the lot of the working class. The public treasury has mastered the *means* -- exploiting bondholders -- better than it has grasped the *ends*.

There is also more bad news. The rates of return displayed in the graph are pre-tax returns. For an investor who paid income taxes at a rate of 20% throughout this period -- a rate far lower than the top rate which has prevailed since the early days of the Second World War -- the after-tax rate of return on corporate bonds averaged 13 basis points, and the return on Treasuries was a *negative* 60 basis points. Thus, for a taxable investor the rate of return on taxable bonds was at best zero, and *any* proceeds which he -- in practice, "he" is likely to be an insurance company or a bank -- consumed came entirely from capital! Put somewhat differently, the tax rate on income from bonds is at least 100%. This represents a very large commitment indeed to the labor theory of value, though it is a commitment which appears to have weakened significantly in the last fifteen years.

Is this the future?

The last twelve years represent something of a break with the preceding period because they have provided very respectable rates of return on bonds. Assuming a tax rate of 30%, the return on corporate bonds still averaged about 3%, and the pretax return was better than 6%. It is noteworthy, though perhaps merely coincidental, that this represents a return to rates of return which prevailed before the First World War.

It is only an impression, though one which the reader can check against their own recollections of history, that sometime in the late 1970's bond buyers went on strike over economic issues -- the very poor wages being offered in their trade -- and that, contrary to what Marx would have predicted, the investors won.

Energy in Abundance

Financial markets today are obviously worried about how much longer the current expansion, now a gray beard of about three and a half years of age, can be prolonged. The consequences of a recession – especially the consequences for the federal budget and the deficit – are more than a little frightening to think about. As sobering as these thoughts are, the fundamental facts are that the bedrock of prosperity have never been firmer.

For a generation or more the environment has been portrayed not as a willing partner of human society, but as a stingy and resentful landlord. The most anguished complaints of the angry tenants were heard twenty years ago when it seemed that the landlord was about to cut off the utilities. It seemed that the world's reserves of fuels were rapidly headed for exhaustion.

It's now twenty years later and our belongings still have not been ejected onto the sidewalk. And far from being exhausted, there is abundant reason to think that the ultimate reserves of fuels have grown dramatically. The increase has come from two sources, one predictable and prosaic and the other startling and almost wholly unexpected.

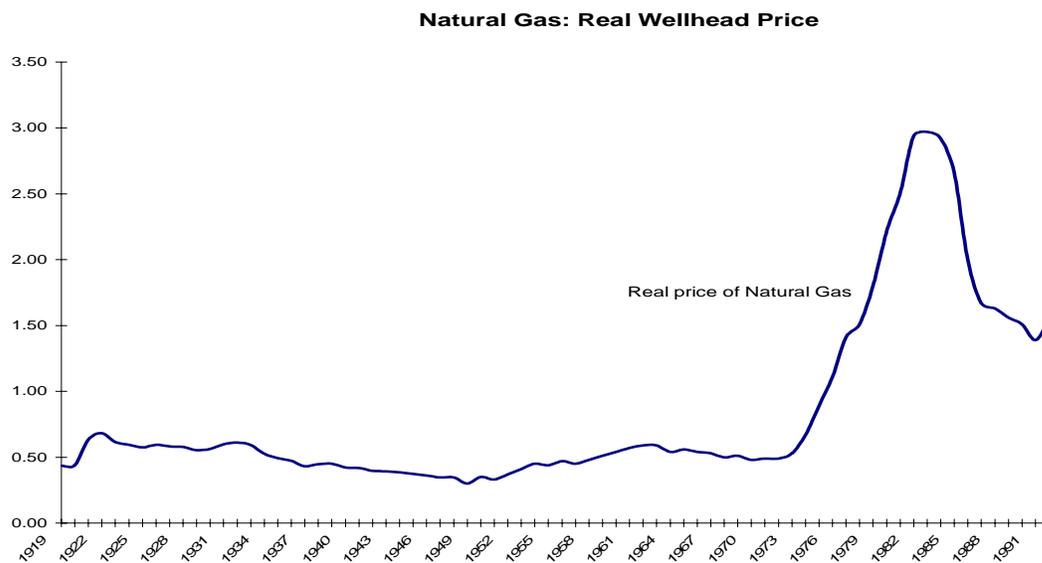
Evolution in Energy Prices and Reserves.

Even in the depths of the so-called energy crisis, it was widely recognized that the coal reserves of the world were equal to thousands of times the amount consumed annually. The *crisis* had to do with petroleum and natural gas, for which world proven reserves were estimated to be somewhere between twenty and fifty times annual consumption. Following strictly the logic of the so-called energy crisis, we would be essentially out of natural gas now – twenty years later – and we would see very clearly the end of petroleum reserves – which with care and great restraint might be made to extend into the middle of the next century.

It is rather obvious that these predictions have not worked out. I doubt that even so committed a believer as Jimmy Carter has exchanged his car for a bicycle. What has actually happened is a large increase in fuel reserves, brought on by the patient application of existing techniques of exploration. Additions within the United States have been modest, but elsewhere they have been astonishingly large. Thanks to discoveries of natural gas in Russia, proven reserves of natural gas, for instance, are about seventy times

current consumption, based on Department of Energy statistics. This is an unusually high coverage of consumption, because it generally doesn't pay to "prove" reserves so far in the future. The payback of exploration costs is much too slow.

The price trends of petroleum and gas tell much the same story as estimates of reserves tell. The wellhead price of crude oil peaked in 1981, and that of gas peaked in 1983, and have tumbled inexorably since then. The graph shows the history of crude oil prices in real terms, since 1900, using 1987 dollars. The most remarkable feature of this history is the almost complete absence of any trend whatever. In 1987 dollars, crude oil was selling for almost \$18 per barrel in 1920, and sold in 1992 for around \$13 per barrel. The disastrous effect of the price controls period stands out in stark relief.



Sources: Annual Energy Review, U.S. Department of Energy and Robert Manthey / Resources for the Future.

Even the staunchest defender of price controls would have a hard time defending the run which occurred between 1977 and 1981. The culprit, moreover, has never been brought to justice, although it is currently under house arrest. During the Carter years the Strategic Petroleum Reserve set about to buy up crude oil to insure against the day when we would run out. Since a rising price of oil was assumed to be a sign that catastrophe was immanent, the operating procedures of the Reserve provided that the higher the price soared, the more they should buy. Allegedly, for one brief, heady week in the summer of 1979 the Reserve attempted to buy up the entire world output for the week.

Sales from the Reserve have undoubtedly accelerated the decline in recent years, but sales have been slowed by a disinclination to recognize the large losses which have occurred on the oil in reserve. The tendency of the Reserve to exacerbate price swings is particularly ironic since the motive for holding inventory in the private sector is precisely to diminish price shocks. Now, what was that about a health care crisis?

Revolution at the Center of the Earth.

Timely discoveries of oil and gas have prevented the price of oil from rising significantly in this century by insuring a continuing abundance of these fuels. Behind the scenes of these successes, a revolution has been brewing in the way scientists view the Earth itself, in ways which points toward a revolution in petroleum geology.

The conventional wisdom in geology has for a long time been that whatever pools of hydrocarbons the Earth possesses are a result of the steady build up of solar energy, which was captured by plants and animals and deposited in the Earth by the inexorable evolution of the surface layer of the Earth. It would follow that the ultimate amount of hydrocarbons available from this source depends in the amount of solar power which could have been stored up by this extremely time-consuming way, and of equal importance it follows that the resulting reserves must all be close to the surface, because the same theory asserts that any hydrocarbons which happened to be pulled down to great depth would be destroyed in the process.

The great Russian chemist Mendeleev, discoverer of the period table of the elements, believed more than a century ago that petroleum and other hydrocarbons have a very different origin, within the Earth. The evidence that he was right continues to accumulate, along with a startlingly new conception of the entire geological history of the planet. The person most responsible for these developments is Professor Thomas Gold of Cornell University. It is now generally accepted that the Earth was formed from by the accretion of meteorites which collided in space and stuck together. That may not seem like a very classy way for a great planet to get its start, but it has very practical benefits because meteorites contain an abundance of hydrocarbons. The tails of comets, for instance, are often composed of vaporized tar. Professor Gold concludes that the Earth is permeated right to the center by veins of hydrocarbons, which tend to migrate to the surface because of the high temperature and pressure in the core.

The important practical implication of his theories is that the total amount of available petroleum and gas is much larger than the amount which exists near the surface, and he has completed a practical test of this claim. The test consisted of drilling three deep shafts at a promising site in Sweden in hopes of striking oil. In a report published by the U.S. Geological Survey, he reports on the petroleum which he found there, in circumstances which defy explanation by the conventional theory. The depth of the deposit, about six miles, is obviously one of the most important pieces of evidence for this novel theory. Unfortunately, it also makes the resulting finds very expensive for commercial purposes. It will be a long time before petroleum from that depth will be able to compete with cheap petroleum and gas lying nearer to the surface. This success has led him to turn his attention to a site in Switzerland, but development of that location now awaits investment capital.

The world is actually far from needing unconventional fuel from the center of the Earth. The average depth of gas wells and of oil wells are both about one mile, and both averages have extended by only 1000 feet since 1950. Thanks to new methods of

exploration, moreover, the proportion of development wells which turn out successfully has actually *gone up* steadily over the last twenty-five years.

Along the way to discovering crude oil six miles below the tundra in Sweden, Professor Gold has had to challenge many hoary monuments in the science of geology, and this fact imparts to his work a truly revolutionary character. But like a wealth of other breakthroughs of this century, it is ultimately a product of the level of prosperity and economic efficiency which permits talented men and women to devote whole lifetimes to unraveling mystifying questions. If, after fifty thousand years of human history, we can still learn so much, and un-learn so much, about such a fundamental question as what the Earth is made of, it is certainly too early to start worrying about the future of the race.

Novus Ordo Saeculorum

This bold claim, which can be rendered as “a new world order,” graces the back of every dollar bill, and expresses the belief that the United States would some day assume the role of guarantor of a liberal order which unifies and integrates the fragmented peoples and nations of the world. President Bush recognized that that time had come. The United States stands astride the world’s stage as a new empire. Its premise is the federal structure inherited by accident of birth and a tradition of voluntary cooperation and negotiation. Its genius is to break down barriers which divide tribe from tribe and nation from nation around the world.

The demands of this empire are heavy, and the changes which it will bring about in the United States itself will often be difficult to accommodate. But it is the inevitable consequence of the history of European exploration, which first lifted the shroud of isolation which separated the third world from the more advanced world, and separated the world along lines of East and West and North and South.

A New Order of Business

The sheer magnitudes of personal fortunes and of the incomes of successful people are stunning to people whose mental scale is mired in the ‘70’s. With only a few exceptions, like the Hunt brothers who managed to run history in reverse, the old time tycoon who was proud to count his fortune in millions would be a piker by today’s standards. Hosting a talk show is today nearly as lucrative – and pays far better on a per hour basis – than building U.S. Steel. This is without doubt a gilded age, and a lot of people are left muttering and scratching their heads, and grumbling testily about the decade of greed.

This change in magnitude has elicited a predictable response of jealousy and sumptuary laws. It was surely no accident that the prosecution of Michael Milken focused more on the fact that he took home a \$550 million bonus one year than it did on the economics of leveraged buyouts and inefficient corporate bureaucracies. The implicit message was that it was simply impossible for anyone to earn a half billion dollars honestly. The Bush and Clinton tax bills also rose, or sank, to the challenge of public opinion. No force has been able, nonetheless, to restrain the incredible profitability of occupations and businesses which cater to the world market and which use the tools of mass communication. They access markets of a scale which is almost qualitatively greater than the scale of any single country.

Historical Comparisons

Every empire breaks down existing political and military barriers, usually replacing them with new ones based on exploitation by the conquerors. This new world order, by contrast, has no conqueror and no new exploiter. In this respect it is patterned after the Roman Empire, and the conscious repetition of the Latin proclamation of a new world order was indeed prophetic. The lines of this analogy are very interesting.

The Pax Romanum at its peak spanned five time zones, stretching from the Persian Gulf to the Irish Sea. That vast territory, which reached a population of over 250 million people, was never ruled from Rome, however. Direct Roman governance was limited to Italy and to a few enclaves which adopted Roman citizenship. The rest of the empire consisted of a loose federation of fairly sovereign states which submitted to certain prerogatives of Roman citizenship and law, paid taxes to Rome for the maintenance of the imperial army, and enjoyed the benefits which derived from belonging to that vast world without frontiers. No city benefited more than Alexandria, Egypt, of which it was said that one could buy anything in Alexandria except snow. By maritime routes across the Indian Ocean it traded for Indian sugar and Philippine gold, to exchange for North African wheat, British tin, and Russian furs.

The change brought about by this revolutionary expansion of business opportunities shocked the ordinary Roman too. Lacking the subtle mockery of Robin Leach, the Roman government resorted to fines – equally ineffectual – for excessive shows of wealth. It is reported that where at one time a certain government official was fined for possessing more than ten pounds of silver dinnerware, a generation later a far wealthier one boasted of ten thousand pounds of silver cutlery.

While Rome did not govern the day to day affairs of its allied states, it established and enforced standards of commercial law throughout the empire. This insured to every merchant equal treatment of commercial relationships wherever he traveled, and offered some defense against the exactions of local potentates. Typical of this police work was Caesar's successful campaign against the pirates of the Aegean Sea, who were progressively strangling commerce through the Aegean and impoverishing Greece.

The empire **of** peace was rarely an empire **at** peace; the Roman legions could rarely rest for long. The empire continued, however, as long as the Roman Senate was willing and able to send its legions to campaign on foreign shores to punish breaches of the peace and to enforce the paying of taxes to Rome. The legions themselves never faltered. In innumerable conflicts from Britain to Iraq, they took on every possible kind of local army and very rarely lost, despite the numerical superiority of their enemies. Long after the Romans had lost all interest in empire, the last of their legions, joined by Gallic allies, defeated Attila the Hun at Chalons-sur-Marne. The empire died from inside, brought down by a combination of inertia in the Roman government and economic and societal decline in Italy.

A World of Opportunity

The new world empire will, like its predecessor, engage the ambitions and imaginations of generations of young people, not only Americans but from every place where the empire extends. Most will be responding to the commercial and cultural freedom which flourished under the imperial wing. Some of the most ambitious will choose the public service, addressing the demands of administration and military preparedness. The resulting class of citizens of the empire will naturally be freed in many ways from any association with various states and localities, and they will share common interests with their peers rather than with their nationalities or their places of origin.

The federal government must also redirect itself in fundamental ways. The maintenance of the new world order – the concerns associated with “foreign policy” – will be unquestionably its highest priority. It seems unlikely that this country will ever again have a truly domestic president or a national domestic agenda, and likely instead that domestic issues will be left to the states and local governments to deal with. The Congress and administration will have a hard time balancing the domestic and international ramifications of policy, and will inevitably tilt increasingly toward satisfying the international constituency rather than the domestic one. This change can be accommodated under our historic framework of limited federal government, although it is fundamentally inconsistent with the activist traditions of the New Deal.

The NAFTA and GATT debates are mere precursors of a parade of difficult decisions which the federal government will have to make, which require balancing America’s role as the patron of a liberal world order against the perceived needs of large portions of the American people. These decisions are not going to be made any easier by the fact that our trading partners will be more inclined to indulge parochial domestic interests than will be or can be. None the less, for the foreseeable future we will not walk away from the internationalism which the new world order demands.

There is danger lurking in the midst of the new world order, a danger which is indivisible from the vast rewards which the new world order offers to ambitious individuals. The danger is that a two-tiered society will evolve, in which persons who live and compete on the world stage will be divorced from the majority who continue much as before, living and working in a local or community environment. Again, the Roman experience shows the way. The immense estates of the Roman nobles did little to elevate the lives of the peasants who surrounded them. The peasants, meanwhile, became increasingly desperate as competition with both slave labor at home and imports from around the empire drove them from the land and into the growing urban proletariat, which history books describe as subsisting on bread and circuses. For a time, this process of impoverishment had the beneficial effect of providing a steady stream of recruits for the army, which was the escape route from the dole.

In this environment, investment in children dried up. The wealthy were not willing to invest in general education, as long as their own children were well provided for. And the social supports for the family, which both demands and conducts most

education in the young, collapsed in the face of public indifference and growing squalor. The leaders of society became too wrapped up in the rewards of the empire to pay attention to the distress at their doorsteps, and too jealous of their great fortunes to provide essential social services to the public as a whole.

The American empire will thrive for a long time whether or not the United States finds a way to cope with the centrifugal force created by the world of opportunities which follow from it. The empire is simply too valuable and benefits too many people all over the world to stumble on such a small stone. The cultural and economic benefits of a single world market and a single cultural melting pot are incalculably large. Whatever measures are taken to preserve the health of community and family, therefore, will have to be done locally or at the state level. They can not be done without the active support and leadership of the most successful members of society.

That leadership will have to extend far beyond spending money. Indeed nothing is more expensive or more counterproductive, or more characteristically Roman, than more bread and better circuses. A more promising place to start would be to guarantee to the poor -- both urban and rural poor -- the protection of the law which the Constitution asserts as a fundamental right to all Americans. The poor need a consistent police presence -- beat cops -- which comfortable neighborhoods do not need. Providing it will take money which can only come from those who are well off, from people who can afford to insulate themselves from urban crime by building higher walls and hiring fiercer guards.

The successful, moreover, have a right to self defense, just as they have a right to be rich and productive. But if they take that as a opportunity to ignore the needs of the broader community around them, that community will, like imperial Rome, wither and die from neglect.

Is Life Fattening?

Bond buyers are widely accorded the dubious distinction of believing that prosperity is bad – agonizing over every down tick in the unemployment rate and swooning whenever a hopeful contractor breaks ground for the house of someone’s dreams. From our vantage point as bond *traders* – and thus neither investors nor borrowers by conviction – we can afford to be somewhat dispassionate about this. The question of whether prosperity is bad for bonds is nonetheless an interesting one. I will try to make the case that it is not by focusing on the pivotal connection between prices of commodities as they relate to both the economy and to inflation. I will be content if I am able to salvage some honor for the community of bond buyers even if no such rescue is available for life.

Thinking about Commodities and Inflation.

Prices of industrial commodities are much higher today than they were a year ago by any measure, and so are bond yields. It is tempting to explain this coincidence in terms of a connection between commodities and inflation, between the dollar value of raw commodities and the value of the dollar itself. The only commodity which works that way is gold, while industrial commodities are only a barometer of real economic activity, and not of inflation.

Many readers will readily recall a time when commodities were suspected of being not merely a sign of inflation, but of actually being the cause. That was at a time which followed the relaxation of price controls which has suppressed price adjustments in the commodity markets. Commodities did skyrocket between 1973 and 1975, as did the cost of living generally. In the fifteen months from March, 1973 through June, 1974, the Journal of Commerce index of commodity prices soared by more than 30 per cent, and the CPI rose by almost thirteen per cent. While the surge in commodities stopped abruptly in the middle of 1974, the underlying momentum in the CPI continued at least through 1975. The cause-and-effect connection between commodities and general inflation seemed as clear at the time as the correlation between them. Like so many other correlations, however, this one proved to be a sprinter rather than a marathon runner.

The most unmistakable evidence that prices of commodities have not been a significant cause of inflation is the fact that they have not even participated in inflation. From the beginning of 1955 through the end of 1994, for instance, the CPI grew at an

average rate of about 4.4% per year, while the Journal of Commerce index grew at the rate of 1.9% per year. The real – CPI-deflated – cost of industrial raw materials has fallen since the mid-50's. It has actually fallen quite steadily throughout this century.

The reason for this trend is, quite simply, that we apply more processing to each dollar of raw materials than we used to. The progress of technology has taught us how to make far more sophisticated end products than ever before out of the same raw materials, at the cost of adding many costly processing steps along the way. Some technological change has tended to lessen processing costs themselves, i.e., labor-saving and capital-saving technologies, but in sum, technological progress has caused us to apply more of these resources to each unit of raw material. No single evidence of this trend could be more compelling than the fact that the essential raw material for modern computers – oxides of silicon – is what in a simpler age we used to call sand.

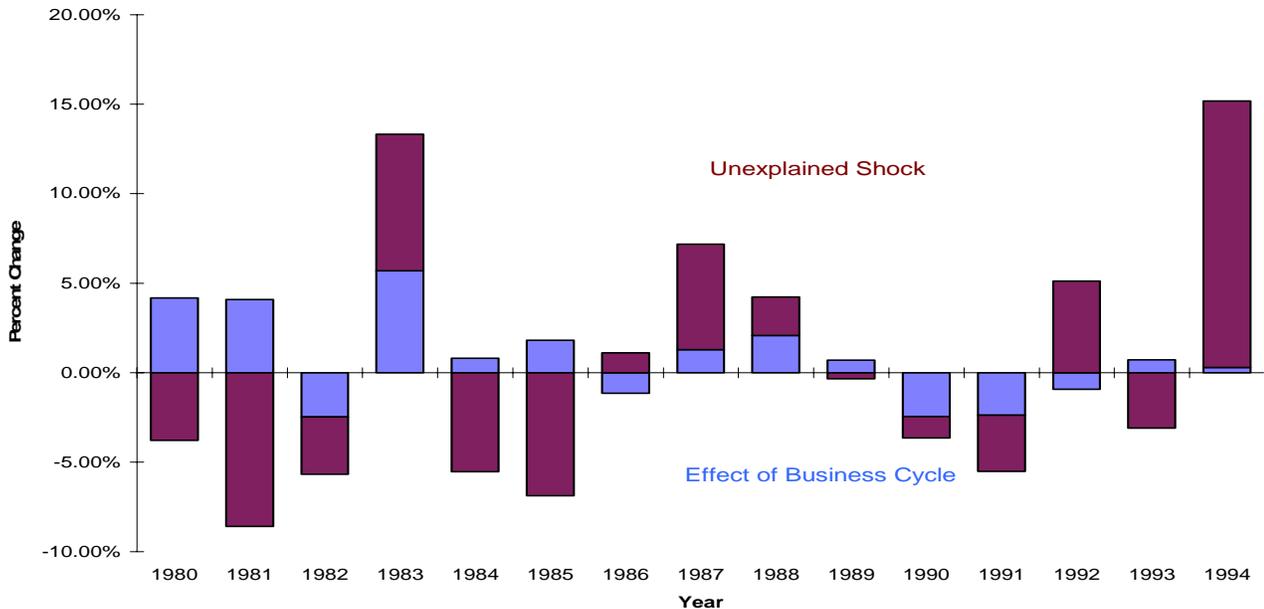
This is not to say that commodity price inflation is entirely disconnected from general price inflation. The transmission of commodity price shocks is quite visible in the correlation between commodities and the CPI. Based on data from 1958 to the present, each rise in the Journal of Commerce index has been associated with a small but significant rise in the CPI. Empirically, the 23% increase which the commodity index has experienced in 1994 should have by itself resulted in about 1.7% inflation. The remaining 1% rise in the CPI – corresponding roughly to the so-called core rate of inflation – came from higher costs in the processing chain from raw materials to finished goods and services. One byproduct of the analysis which follows is that I will be able to cite a somewhat more precise estimate of the inflationary impact of the commodity rally of 1994.

Commodities and Real Growth.

Commodity inflation and commodity deflation are by no means recent phenomena. For as long as there has been a monetary asset against which prices are quoted, prices have fluctuated in nominal terms. Only in recent times have statisticians bothered to keep tabs on such ephemeral prices as the average cost of a visit to the doctor or the price of memory chips, but raw materials have always represented familiar aggregates whose prices are widely followed and – at least in comparison to medical services – easily measured. Prices of industrial raw materials, moreover, generally move with the business cycle. The accompanying graph bears on this point.

The graph shows two components of year-to-year changes on the Journal of Commerce index: the component which can be explained by the business cycle and the component which cannot be accounted for by the cycle. The graph is drawn so that the net change in the price index of commodities is the sum of the two components. The light gray bar singles out the contribution from the business cycle and the dark gray bar represents the unexplained portion. Where the two bars have the same sign, the total effect is simply the sum; where they have opposite signs, they cancel each other. Thus for example, the total effect in 1980 was about zero, because the positive economic component canceled a negative shock.

Commodity Price Inflation and Deflation



The period covered by the graph runs from the end of 1979 through 1984. Three of the first four years exhibit a generally strong positive cycle effect, while the years 1990 and '91 show a strong negative effect. We do not ordinarily think of 1980 and '81 as being peak years in business cycle terms, and indeed they were not good for most purposes. The difference here is that I have used *nominal* rather than *real* GDP as the measure of the economy. That highly unusual step is justified in this case. Empirically, the relationship between commodity prices, on the one hand, and GDP is actually the *same* for real and nominal GDP. Each 1% gain in *real* GDP is associated with approximately 1% gain in prices of commodities, and each 1% increase in the GDP *deflator* is also associated with a 1% gain in commodity prices. Now, any 1% gain in *nominal* GDP is simply the sum of a change in real GDP and the change in the deflator. However that breaks down between real growth and inflation, the result adds about the same 1% to commodity prices.

The figures which are plotted in this graph come from a statistical model of commodity prices which is based on a much longer history. The underlying data cover the period from 1958 through 1993, with quarterly rather than annual observations on GDP and commodities. The longer period affords us a much broader basis for drawing conclusions and enables us to adjust for complications in the linkage between the variables.

The Surprising Commodity Rally.

The strength of the commodity rally would have to be accounted as a surprise. The graph illustrates quite clearly the regular cyclical character of commodity prices. When GDP grows faster than usual, whether it is truly a gain in real GDP or not, commodities rally, and when GDP languishes, commodities fall. One fact which the graph does not make clear is that on average, at least since 1958, prices of commodities have fallen behind nominal GDP. The constant term in the statistical model measures the difference in trend, and it is substantial. On average, nominal GDP has grown much faster – by about 6% points – than the commodity index has. Even real GDP has grown faster than nominal commodity prices have.

In view of the strong relationship between commodities and the economy, it would be natural to ascribe the recent bull market in commodities to the economy. Economic factors may indeed explain the past year, in which the price index of commodities soared by about 23%, but if so, it represents a departure from the usual relationship. The “1% rule” cited above shows the difficulty of this explanation. Real GDP rose a healthy 4% in 1994, and nominal GDP grew about 7%. It follows from the 1% rule that the economy explains about an equal 7% increase in the commodity index. Most of that increase is, however, swallowed up by the negative trend in commodities. The component of the commodity rally which can be explained by the statistical model is a meager 1% (7% from the economy, minus 6% trend).

The same situation shows up very clearly on the graph. The last bar on the chart corresponds to the year 1994, and consists of a very small contribution from the model about 1% and a huge unexplained shock – about 15%. These components don’t add up to the full gain in the commodity index because the statistical model ascribes the remaining 7% to various adjustment lags. But 15% is large enough, especially since it is that part of the move in commodities that cannot be explained either by the real business cycle – real GDP – or by the pass through of general inflation – represented here by the GDP deflator. Since it does not seem to have been *caused by* general inflation, it will be the *cause of* inflation in the future. Applying the statistical relationship between commodities and the CPI, a 15% rise in the commodity index accounts for about a 1.1% increase in the CPI. The commodity rally should add a total of about 1.1% to the inflation rate for last year and this year (e.g. .55% each year). The pressure which this commodity rally placed on short term rates has been very evident over the last year, although short rates have actually risen by much more than 1.1%. This estimate is less than the 1.7% I introduced earlier, but it is still significant.

Prices of raw materials have rarely been a source of inflationary pressure in the post war period. This is true both because commodities have consistently fallen behind other prices, and because some part of any commodity rallies which have occurred has clearly been a temporary response to cyclical price pressure. Against this backdrop, 1994 seems to have been almost unique in the degree of exogenous price increases in commodity markets. As far as commodities go, life is sort of fattening, but that is too easy an out to explain a year like 1994.

As Cautious as Croesus

Croesus was a king in ancient times whose vast wealth made him the standard by which other people were judged. It was a high honor to be as rich as Croesus. What made his pile so visible to an admiring public was that he accumulated it in gold, because that was for practical purposes the only financial asset available at the time. Perceptive people of that day recognized, as we do, that gold is not really wealth, but is only a kind of counter for wealth. But the convenience of the counter was enormous. A simple vault in the palace of the king could hold a fortune equal to an immense acreage of prime farm land, and the gold did not bring with it hordes of recalcitrant peasants, unpredictable weather, and leaf blight. Gold, like other financial assets, is a form of wealth which requires very little active management by the possessor, at least in comparison to any form of so-called real wealth. It is unique, however, in being the centerpiece of the gold standard, which is again the talk in financial circles.

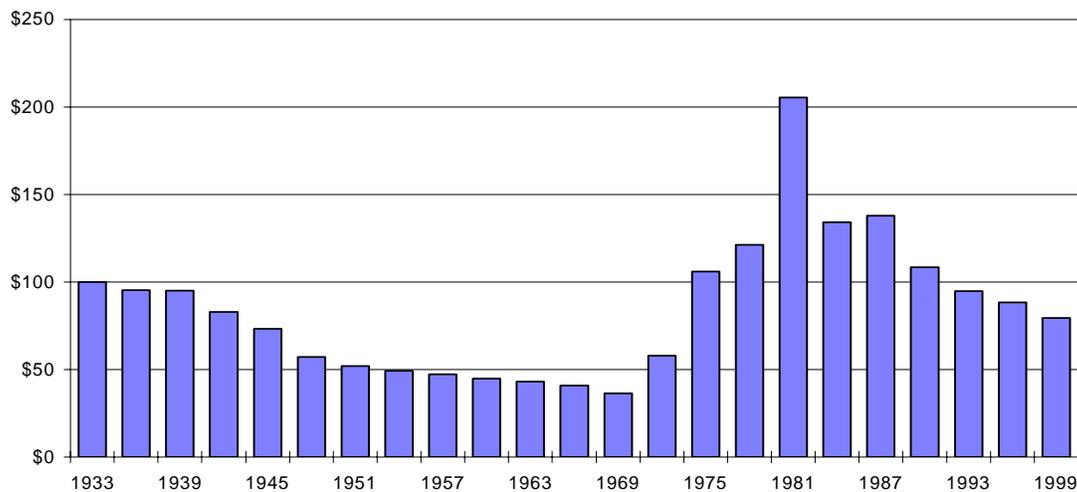
Gold is only one of many financial assets today. Individuals rarely hold a significant fraction of their wealth in this form. But it is one which serves as a hedge against inflation in fiat money. Alan Greenspan is said to watch the price of gold closely, for signs of market sentiment on inflation and deflation. The insurance that it provides is effective, though expensive. A present-day Croesus would be more cautious than rich.

Gold and Inflation

There are two essential characteristics which an inflation hedge must have. The first and most obvious one is that over long intervals of time its real value should be much less variable than its nominal value, or in other words its real value should be highly predictable off into the distant future. As an ideal, we might say that the real value should be constant, although strictly speaking that would be impossible to achieve. It is permissible for an inflation hedge to earn a real rate of return – i.e., for the real value to grow steadily over time; but if the asset is, like gold, essentially riskless, the real rate of return should be small. In any case, positive and negative real rates of return have to be transitory. It would be better for the expected rate of real return, which in the case of gold is the same as the rate of change of the real price, to be absolutely zero forever. Many investments which are pretty good inflation hedges, such as farm land and commercial real estate, earn a significant real return as well, but that is because they entail a lot of investment risk.

The degree to which the real price of gold has been constant over time is truly remarkable, as the accompanying graph shows. This graph is our *Logistic Centerfold* for the month of February. Our February centerfold has an affinity for gems, does important work in the medical field, and thinks platinum is “too too”. Beyond that, she coyly declines to be interviewed, but in any case the picture speaks for itself. It covers the period from 1932, when the price of gold was first fixed at the then market clearing price of \$35 per oz., to 1999, a span of 67 years. In order to clarify the overall trend, I have taken years three at a time, which leaves the twenty-two points shown. “The” price of gold at each point is simply the average over that three year period, deflated by the CPI.

History of the Real Price of Gold
CPI - deflated gold as a percent. 1932 – 1934 = 100



*Sources: CPI: U.S. Department of Labor
Gold: Handy & Harmon afternoon fixing*

While gold has varied in real terms, the net change over the period is rather small, as the graph shows and the following simple calculations confirm. At the end of May, 1999 gold was selling for about \$260 per oz. If it had simply risen with inflation, starting in 1932, the price would have been \$430 per oz. If one test of an inflation hedge is the predictability of its real value, this is a pretty creditable performance. There are not many factors which one could one forecast 67 years ahead and come within about 40% of the actual result. The price of gold has fallen precipitously this year, and if we used an average price – the average price that appears on the graph as the last column – the real price of gold has fallen only about 20% over a span of 67 years.

It is tempting to delve into the unique factors that have influenced the price of gold over various subintervals of this history. The recent years, in particular, have been colored by two bearish events: the creation of a unified European currency that is a new,

highly credible reserve currency, and also a runaway increase in mine production. The creation of the new Euro is probably already familiar, though what has happened to production probably is not. This decade has actually witnessed the greatest gold rush in history. It would be a mistake, however, to interpret these sorts of events as in some way an exception to the rest of history. There are always good, fundamental economic reasons for why the real price of gold is stable in the long run. It is the microeconomic forces of production costs and demand for gold jewelry, among others factors, that eventually have to do the heavy lifting of keeping the real price in line.

While the high predictability of gold's real value probably may come as something of a surprise, the overall shape of the history surely comes as no surprise to anyone from the baby boom generation. Gold first rallied after President Nixon closed the gold window in 1971. Even though the years surrounding the relaxation of the Nixon price controls were a time of high inflation, gold soared even faster, and by 1975 it had made up all the ground lost between 1932 and 1971. This sequence was repeated in the second half of the decade, with gold finally peaking in January, 1980. It closed at \$850 per oz. on January 21st. Since then, gold has slid pretty steadily in real value, except for a short-lived rally in 1987. There is little evidence that we have reached a bottom of the bear market. The nominal price is lower today – at \$260 – than it has been at any time in the last twenty years.

There is no denying that within the period there were times of very large positive and negative real returns. Surprisingly, their existence does not invalidate the proposition that gold is an inflation hedge. On the contrary, these large returns are necessitated by the rules of how an inflation hedge works. This is tied up in the second essential characteristic of an inflation hedge.

Gold and Unexpected Inflation.

The idea that the real value of an inflation hedge should be roughly constant over time is easily accepted, and seems to be true almost by definition. What is less obvious is that when inflation accelerates, an inflation hedge must outpace it, and conversely when inflation slows, the hedge must slow even more. In other words, an inflation hedge must have a positive expected real rate of return in inflationary periods and a negative expected real rate of return in disinflationary times.

An asset which simply followed inflation would provide insurance against inflation only up to the amount invested in that asset. At that rate, gold would be a diversifier of risk – by hedging up a part of the total portfolio – but it would not be a hedge asset for the whole portfolio. An inflation hedge must generate gains and losses to offset inflationary losses and disinflationary gains on the rest of the portfolio. It does so by realizing a positive real rate of return when inflation accelerates, and correspondingly a negative real rate of return when it decelerates. The cumulative real rate of return over long periods of time will net out to zero, as it did over the last sixty years, if episodes of unexpected inflation and unexpected disinflation net out.

It is possible, using the last twenty years of data, to be more precise about how much gold one would need to hedge a portfolio. There is no single universal answer to this question; as it depends on the specifics of the portfolio and on the investor's investment horizon. It is obvious, for instance, that you need more gold to hedge a portfolio of long term bonds than to hedge a portfolio of commercial real estate, because real estate rentals adjust to inflation. The relationship between gold and inflation, however, is the same regardless of what else any particular investor has in his portfolio, and so it is possible to get a fairly definite answer to that part of the analysis.

Over the last twenty years, the empirical rule has been that gold rallies about 5% for every 1% that the inflation rate accelerates, and symmetrically that gold falls about 5% for every 1% drop in inflation. The changes in inflation referred to here are one-time-only changes in the cost of living, and the associated change in the price of gold is also a one-time-only event. If instead the added 1% of inflation was *permanent* – with prices rising indefinitely by an added 1% *each year* – gold would also have to rise 5% every year. Stepping back from the brink of endless inflation, let's fix on a single, one-time-only 1% rise in the CPI. A 1% rise in the Consumer Price Index would lower the real value of any bond or note which matures more than one year in the future. Since the note would be repaid in dollars which are worth 1% less, its present – and therefore totally “real” – value would also drop by 1%. Using the 5% rule quoted above, to hedge a portfolio of bonds and notes, one would want to own \$1 of gold for every \$5 of fixed income assets.

Bonds and notes are of course unique in as much as the real cost of inflation on their value is entirely governed by the nature of the security itself. Any other asset, whose future cash payouts can float more or less cleanly with inflation, would require further detailed analysis and quantification, which we cannot attempt here. It seems safe to say as a general rule, however, that other assets are less impacted by inflation than bonds are, so gold should constitute somewhat less than 1/6th of any investment portfolio.

It may seem unfair of us to recall beleaguered Croesus at this point, because he was presumably not thinking of hedging inflation when he laid up his store of gold, and he has already endured centuries of scorn as the lead character in the story of King Midas. In his defense, gold performed financial services which we obtain today in other, more efficient ways. Nonetheless, it is impossible to let him off without noting that he was a good **six times** as cautious as a prudent investor needs to be.

The Gold Standard

Proponents of a gold standard like to point to the hedging properties of the metal as the rationale for a gold standard. The premise is of course that if gold holds its real value over time – which it does – and that if a nation wanted its currency to do the same, it should make a firm contractual tie between the two.

Speaking only for myself, I have very little interest in this idea, and I think that most investors would feel the same. The only things that are really important are that *gold* be on the gold standard and that it be available to the investing public. At one time or another, the sponsors of nearly every other currency have promised that their brand would be just as good as gold. This note of skepticism should in no way, however, diminish the real achievements of that noted gold bug at the Fed.

Money Supply

The extra “S” is for extra supply.

Chairman Greenspan has addressed Congress three times in the last few weeks, and on each occasion he has delivered a sort of good news - bad news message. The good news is that everything is under control and will remain so as long as he is at the helm. The bad news is that it is starting to look as though the money supply has been too generous for the last several years. To be more exact, he observed that some early evidence of inflation has surfaced among the data he looks at.

Inflation Expectations

The most remarkable aspect of the long expansion which started four years ago has been the lack of cyclical pressure on prices. We have basked in a seemingly impossible combination of growing real output and relatively stable prices.

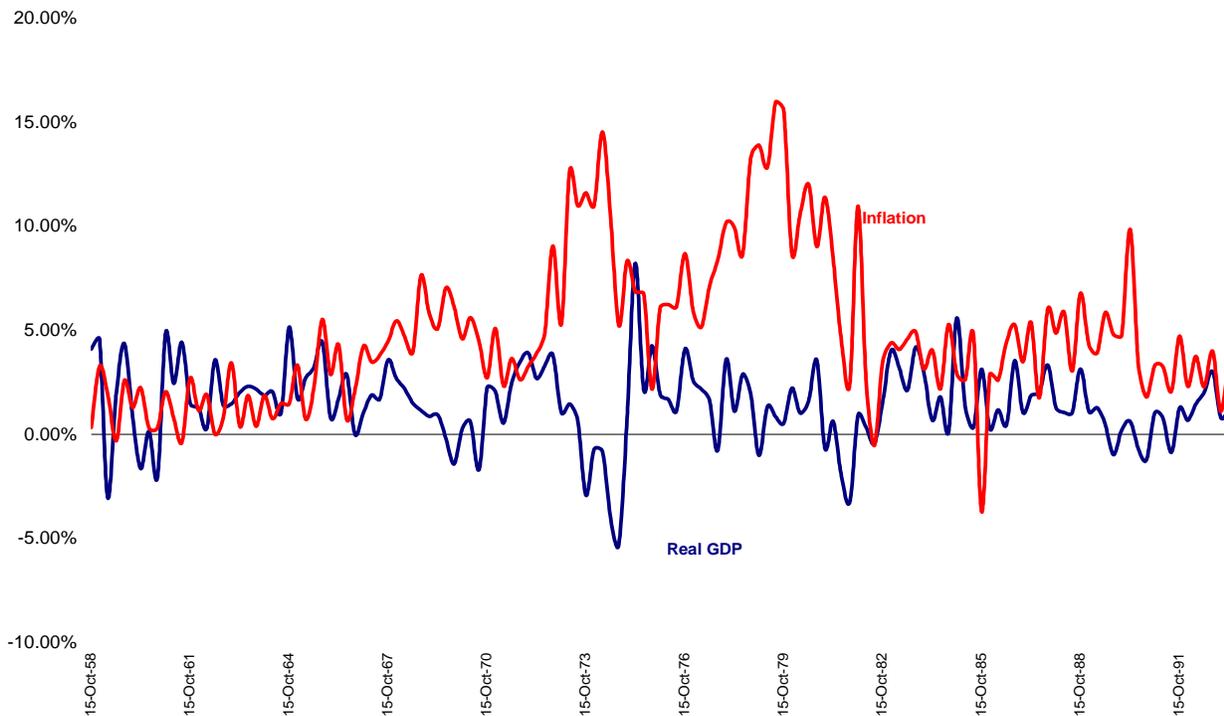
If stability refers to a period in which the inflation rate does not exceed its long term expected value, the last few years would have to rate with the early ‘60’s. Last month I pointed out that in real terms the price of gold was essentially the same today as it was in 1932. It follows from that fact that the actual rate of inflation over the period was equal to the expected rate, i.e. that episodes of unexpectedly high inflation have been almost exactly balanced by ones of less than expected inflation. The high sensitivity of gold to unexpected inflation imply that even a small balance of inflation or disinflation would have resulted in a significant change in the real price of gold. If the average rate of inflation had been even 1% higher than the expected rate, the real price of gold would have risen on average by 4% **per year**, compounded for sixty-three years! Since 1932, the inflation rate has averaged almost precisely 4% per year, so that is a good estimate of expected or “normal” inflation. Any time that inflation runs less than 4% and stays within a fairly narrow range would therefore have to be counted as a period of relatively stable prices.

Portents of change are nonetheless visible on the horizon, as Mr. Greenspan has pointed out. Commodities are a warning sign: prices of industrial commodities have risen sharply in the last fifteen months. Currencies are another. From a broader perspective, the evidence that the economy has passed its peak for this cycle adds very powerful evidence, which is the subject of the **Logistic** Centerfold for March. This graph looks, perhaps, like the EEG of a very nervous guy, or since there are two tracks, a nervous guy who suffers from multiple personality disorder (which might of course explain why he is

nervous). What it actually presents are data on real GDP and on the CPI, starting in 1959. The actual data are quarterly, but following the usual practice I have annualized the rates of change.

The inflation rate, which generally appears as the higher numbers, shows very clearly the inflationary blow-off which followed the collapse of Nixonian price controls, and the subsequent five-year bout with inflation, from 1978 to 1982. While those episodes help to concentrate the mind, we do not expect them to be repeated anytime soon, and the graph is really intended to highlight a different phenomenon. By comparing the GDP line and the inflation line on this chart, it becomes quite evident that inflation is generally worst during the contractionary phase of the business cycle. Rates of inflation are usually low during the expansion, but they pick up once the economy has peaked.

Inflation and the Business Cycle



The most recent experience with worrisome inflation, in 1990, conforms to the general pattern. Following the disinflationary boom of the mid 1980's, and especially after the stock market crash in 1987, the economy slid gradually into a recession. It was this recession which brought to a head the banking and S&L crisis, and which caused a widespread havoc in the credit rating of corporate America. It is less well known that it also brought on a temporary but significant run of inflation. From the fourth quarter of 1989 through the third quarter of 1990 the CPI was up a little more than 6%. Actually, since 1986 inflation has averaged just about its normal 4%, because the second half of the

decade of the '80's was actually pretty disappointing in terms of price stability. In recent times, the real success story on inflation has been written over just the last four years.

This record underscores two statements made by Mr. Greenspan to the effect that inflation seems to be stirring in the hustings and that the economy seems to have peaked. Inflation and recession, far from being contradictory, are usually spotted together. Although recession and inflation tend to come together, recession is no more the **cause** of inflation than is prosperity; inflation is always caused by printing money. The crescendo of inflation in the '80's was a predictable outcome of the monetary stimulus which the Volker Fed applied between 1982 and 1986. Alan Greenspan came into office determined to undo those policies and up to now has largely succeeded, although it was achieved at the cost of stirring up a little excitement in October, 1987.

Fuel for the economy.

The inflation record is not the only test of Fed policy or the only measure of how expansive money supply has been. What the graph illustrates is the long lags which intervene between the time a given monetary regime is put in place and the ultimate results on the price level. Capital markets provide more prompt feedback, and the message they are transmitting now is cause for concern.

The fuel of the modern economy is money, which performs the essential function of liquidating balance sheets. When the money supply lags, balance sheets become overburdened with risky, illiquid assets which provide relatively poor protection in a crisis. If the private sector is forced to start cashing illiquid assets or even if it is forced to start marking them to market promptly, its margin of safety is squeezed. And when this process of marking to market happens on a widespread basis, the marks start to reflect the net recoverable value of the assets sold under the press of necessity. The effect can be explosive -- witness the stock market crash of 1987 and even more recently, the bank and S&L crisis. A ruthless syllogism is at work: as the awareness of risk rises, the demand for illiquid assets falls. It is impossible to predict how far values must fall before the bid from investors comes back, because the further prices fall, the more risky the assets have proven to be.

The proper role of the Fed in times like that is to provide liquidity to the balance sheet of the private sector. Chairman Greenspan deserves kudos of a high order for providing the crisis liquidity which pulled the markets through the 1987 crash and the 1990 credit crisis. He has certainly not stinted. Using the St. Louis Fed estimates, which have the advantage of being more comparable than the Board's data over long periods of time, the money supply stands at around \$460 billion, and about \$180 billion of that has been added in the last five and a half years. Twenty years ago, by contrast, the *entire* monetary base stood at about \$90 billion. That rate of money creation obviously cannot continue indefinitely.

“So what has the Fed done for me lately?”

Its effects are clearly visible in excessive risk taking. If the Fed has the wonderful power to make investment risk go away at times when the capital markets are weighted down with risk, it also has the power to encourage risk taking in normal times. Anyone who has owned cash over the last five years and has therefore earned a solid 3% return, knows that easy money has killed the return on low risk investments. When money is plentiful, the value of liquidity is small. It hasn't helped that American banks, which are still licking their wounds from previous disasters, have been very indifferent about bidding for deposits.

What the Fed has done for you lately depends a lot on who “you” are. Some people really are like the Swiss Banker who only lives off the interest on the interest on the interest, etc., etc. A 3% rate of return is presumably tolerable for them, but most people have shorter horizons and a greater willingness to flirt with bankruptcy. A 3% rate of return on cash inevitably pushes them -- or perhaps like Father Damian I should say “us” -- to venture a little closer to the brink.

The last six months have been punctuated by three spectacular bankruptcies: Barings, Orange County, and Kidder, Peabody. The failure of Barings remains a little mysterious because it seems to defy the rules of the futures business and the exchanges. Futures permits a high degree of leverage of positions when they are opened, but there is no leveraging of trading losses; losses for a day must be made good at the end of the trading day. It is always possible to go bankrupt under the nose of the exchange if it happens in one day, but by all accounts the losses of Nick Leeson took place over a long period of time. Thus, the treasurer of Barings was honoring drafts against his firm which amounted to a very large fraction of the firm's net worth. It doesn't seem possible for him not to know, no matter how poor the bank's management controls were, because the president of the exchange in Singapore -- the Simex -- would be sure to call in person about the drafts.

The problems that Orange County and others have with derivative securities are most directly linked to the consequences of too easy money. On the one side, the county was motivated to reach for yield precisely because the yield on cash was so meager. The fact that Wall Street was only too ready to step in with securities to fill the void is hardly surprising. The mortgage derivatives which Orange County bought were very vulnerable to the sort of radical swings which interest rates have been through in the last five years. More damaging, however, is the fact that the dealers which create these securities cannot afford to buy them back if they perform poorly, and as a result the market value of a derivative can fall essentially to zero overnight. This, indeed, is in microcosm the liquidity crisis.

The collapse of Kidder Peabody, which in many ways was the most shocking of the three, shows in very graphic terms how fragile the pillars of Wall Street can be. Kidder Peabody was one of the oldest firms on the Street, and the bluest blood flowed through its telecommunications network, but it sank without a trace in a shockingly short

time, following the discovery of some trading irregularities on the government trading desk. The firm was simply dissolved, with some profitable pieces being sold to other brokerage houses.

The reason these stories are important at this juncture is that they highlight the capacity of monetary policy to encourage risk-taking. It is imperative that the Fed now move resolutely to rein in the money supply in order to restore a greater appreciation of risk on the part of the trading in investing public. To his credit, Chairman Greenspan has addressed this point both in public statements and in the gradualist approach which he has pursued over the last five year. We wish him luck.

Urban Landscape: Not a Still Life

American cities have not stood still in the last twenty years. Some, like Detroit, are visibly disappearing, like failed experiments which are no longer relevant to the American experience. Most, by contrast, are being fundamentally renewed in ways and to an extent which has only recently become noticeable to an amateur observer. The trend which has come to dominate the urban scene – the return of middle class and even upper middle class neighborhoods – began in earnest more than thirty years ago. The earliest “Old Towns” were easily dismissed as at best quaint, and more likely suicidal. Dismissed as the curious indulgence of an ever-nostalgic young professional class. But block after dreary block of decayed city has succumbed to the onslaught of urban settlers, who have become the dominant economic and political forces in their cities.

The urban homesteaders are well aware of the risks inherent in this venture and of the constant effort needed to maintain it. The issues of crime and crime prevention, which are ever present in urban settings, have been brought into the glare of the public spotlight by the urban settlers, and both Mr. Clinton and the new Republican majorities have taken an active interest.

The Unheavenly City Revisited.

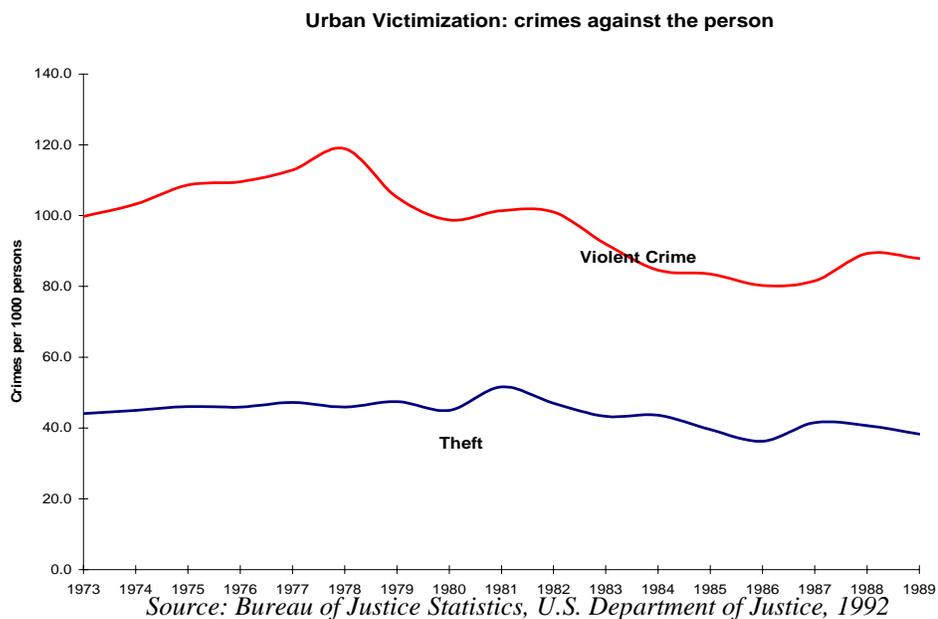
This title is borrowed without apologies from the great political scientist Edward Banfield. As Edward Banfield observed in his book “The Unheavenly City,” the defining characteristic of a city is the abundance of cheap – usually old and rather dilapidated – housing to be found there. The central city in any region is really nothing other than a collection of the old neighborhoods nestled around a business district which occupies the site of the very first settlement. The pull of available space and the amenities of new construction have always lured the prosperous outward, leaving the old neighborhoods to shift for themselves. Successive waves of poor, unemployed immigrants are naturally drawn to fill the cheap shelter left behind.

The east coast and midwest are old enough to have survived three full waves of immigration, the first coming from Germany and Ireland in the middle of the nineteenth century, and the most recent coming in the middle of this century from the deep South. Each of these groups has in time come to terms with the opportunities and the pressures

placed on it by its adopted surroundings, and has thus made its peace with the natives. It would be an understatement to say that each transition was long and painful.

Crime was a predictable companion of the poverty which every immigrant group brought with them. The prevalence of crime was due in part to the radical unfamiliarity of the new surroundings. The one nearly universal factor which cuts across the immigrants is that they came from peasant backgrounds, as the migration to American cities was only one manifestation of the worldwide trend toward increasing urbanization of life. The high population density of the city provided the would-be criminal with an abundance of potential victims, most of whom would be complete strangers unable to help the police very much in their investigation. In the small towns from which they issued, by contrast, the lack of anonymity provided a high degree of community defense against serious crimes, at least crimes committed by long term residents of the community.

Poverty and crime went hand in hand for another reason, which has relevance for the urban homesteading. Police protection is expensive; poor people cannot afford it. As in so many things, they have to throw themselves on the mercy of their more prosperous neighbors. When faced with a crisis in law enforcement, American cities have consistently failed to provide subsidized police protection in anything like sufficient quantities. The victims of this neglect invariably come to believe that it is because the better-off neighbors don't like them, but the fundamental reason is simply cost. The return of a middle class to the cities has, however, created a constituency both eager for and financially able to pay for police protection. The effect on crime rates has been dramatic, as the accompanying graph demonstrates.



Cities as a whole became safer during the 1980's. After rising steadily for many years, the rates of these two classes of urban crime peaked in the last 1970's, and headed down sharply in the 1980's. These statistics do not include murder, since they are based on a survey of victims of reported crime, but urban murder rates must have followed roughly the same path as crimes of violence. The worst year by far was 1980, and since 1972, the best year was 1986. In the six years from 1980 to 1986, the rate of victimization fell from 52 cases per 1000 persons to 36 cases per 1000 persons. These facts defy a whole lot of overheated political propaganda, which attempts to cast Ronald Reagan in the role of oppressor of the urban poor. Mr. Reagan would be the first to give credit, however, to a lot of good police work and police presence on the streets.

A couple of other facts from this survey highlight the socioeconomic nature of crime. One revealing fact is that while cities generally have higher crime rates than do suburbs and rural places, theft is an exception to the rule. Suburbs have the highest rate of theft, by a small margin. The reasons are simply that suburbanites have by far the most things to steal and that theft, which includes most white collar crime, is difficult for police to prevent simply by their presence on the street. The moral of this story is that suburbanites are probably not **by nature** more honest than other people. Another surprising fact shows how little is the correlation between crime and race. In cities, the highest crime rates are found in black neighborhoods. Among the rural population by contrast, black towns have the lowest crime rate. The rates among rural black people are in fact the lowest crime rates among any group in this survey. Lower than for any urban or suburban ethnic group – the ethnic groups are “white,” “black,” and “other” – as well as lower than among any other rural population. Black people who live in rural areas are probably not by nature more honest than other people are, either, but the deterrent effect of a stable, close-knit community is an excellent substitute for a police presence.

Amid the Explosion of Gang Warfare.

As reassuring as the foregoing statistics are, they provide little consolation to one vulnerable component of the population, teenagers and young adults living in inner cities, who are being drafted into a culture of crime which is unmatched since the early days of the Mafia.

The second chart expresses in its quiet way a ghastly crisis among urban minority youth. The incidence of violent crime among all young people increased by almost 50% between 1986 and 1991, when the rate among adults was essentially unchanged. The neighborhoods where they live are still largely abandoned by the police, who are simply overwhelmed by the magnitude of the problem. While changing urban demographics are gradually bringing peace to large parts of the cities, the hardcore neighborhoods, which were abandoned to indigenous gangs thirty years ago, have not yet been touched by this movement. If they are today less of a blight on the city, it is not because these neighborhoods are more law-abiding or even less murderous, it is simply that they are smaller, because anyone who could do so has moved away.

The ineffectual knee-jerk reaction of years past was to “get serious about gun control: just go out there and round up all those guns.” The most obvious deficiency of this argument is that if there aren’t enough police in these neighborhoods to make



Source: Bureau of Justice Statistics, U.S. Department of Justice, 1994

murder illegal, who will be available to check the date stamps on gun permits? Or indeed, who will be brave or foolish enough to demand to see them? Conversely, if the community was serious about preventing the crimes of murder and battery, who would want to be caught using a gun? In any case, the gangs are the source of the guns, so there is simply no way to avoid a showdown. There is no easy solution for violence in poor urban neighborhoods, any more than there is an easy solution for theft in posh suburban neighborhoods.

Decades of systematic research on crime and deterrence leads convincingly to the conclusion that the most effective thing society can do is to increase the police presence in these neighborhoods, both for their direct preventive effect and to better the odds of arrest and conviction for offenders. There is no way to break the power of the gangs except by ensuring the safety of people who are willing to defy them.

The outbreak of warfare between rival gangs has reopened the debate on capital punishment. President Clinton, hardly a hawk on this issue, has come out strongly for it in recent days, although his attention was not on gang warfare in urban neighborhoods. The most widely accepted studies on the death penalty as a deterrent are the work -- now almost twenty years old -- of Isaac Ehrlich, which I had the good fortune to be associated with in a minor capacity. The weight of the evidence and the testimony of common sense really make a compelling case that the threat of execution deters. It would be both unwise and wrong, however, to attempt to undo decades of neglect of poor neighborhoods simply

by pulling up the heavy artillery. Professor Ehrlich's research very clearly ranks the relative effectiveness of law enforcement: the risk of being arrested and charged is the most effective deterrent, the risk of being convicted and punished is the next most effective, and the threat of being executed is the **least** effective deterrent. In a crisis, one can not afford to discard any deterrent, but in the long run there is no viable substitute for extending to innocent people the protection of the law which we all profess.

The president has also spoken recently about the importance of muting hateful and inflammatory rhetoric. In that vein, no scholar that I know was subjected to more vile and unjustified abuse than Professor Ehrlich, who deserves kudos for having the courage to pursue his important research despite opposition which at times transgressed the bounds of reasonable debate.

In Search of the Golden Cat

The Treasury bond market is a comparatively new creation, although its roots trace back to Alexander Hamilton. As recently as the 1920's, the only long term Treasury bonds were the Liberty bonds issued during the war, and these were primarily retail savings bonds. While the federal government began to borrow at longer maturities in the Depression, the Federal Reserve maintained its bills-only policy – under which open market operations were confined to Treasury bills – until the 1950's. The modern Treasury bond market really dates from the disastrous long bond offering in February, 1973. Previous to that time, bonds had been savings vehicles which were for the most part held to maturity; since that time they have been trading vehicles which are priced in a rambunctious secondary market.

This change has been expensive for the Treasury, because in the new regime yields of long-dated Treasury debt have consistently been very high. It is the price paid for forty years of low – actually negative – real yields. Negative real yields served a real purpose in the post-war period because they extricated the Treasury from the crushing burden of debt incurred in the Second World War. But at the same time they served to immunize domestic investors against a complacent buy-and-hold policy. For the last fifteen years foreigners, especially foreign governments, have taken up a rising share of new Treasury debt. While this has had a salutary effect of holding required real yields down, we had better not lose sight of the fact that these holders will not sit idly by while we depreciate their assets.

Every Secretary of the Treasury would love to hit upon that wonder of genetic engineering, the golden cat, which is half cat and half goose: it has nine lives and lays golden eggs. For the last twenty years they have hunted this beast on foreign shores, especially in Germany and Japan. Predictably, our welcome is wearing somewhat thin.

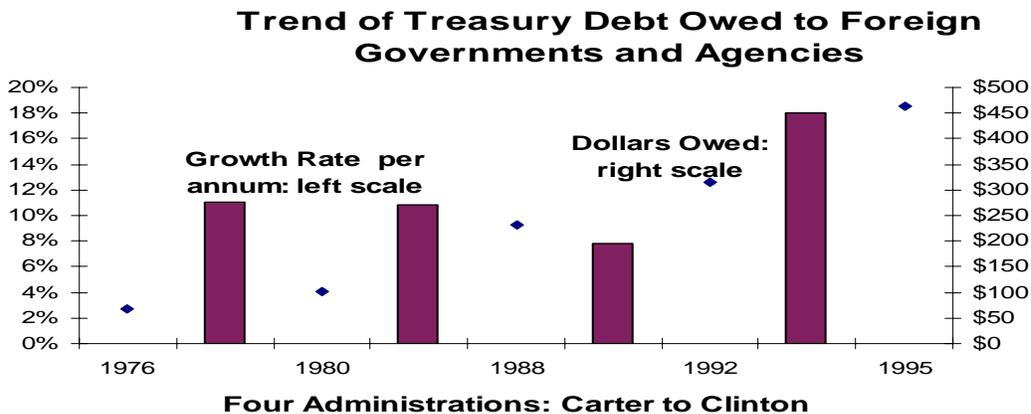
The Explosion of World Dollar Reserves.

The status that America enjoys as the source of the world's reserve currency is valuable enough without mythical embellishments, and its importance has grown explosively in the last fifteen years. This trend was viewed with concern bordering on anguish ten years ago, when we Americans stood accused of letting hard working foreign savers finance our luxurious lifestyle. This concern seems to have slipped off the front

page since then. Yet the extent of foreign funding of the debt has not diminished; it has grown along with our fiscal deficit. As always, a review of the facts is a good place to start.

There have been two distinct episodes in recent years when foreign investors accounted for a particularly large share of domestic investment. These episodes correlate with presidential administrations: Ronald Reagan’s second term and Bill Clinton’s term. Statistics on saving and investing come from the National Income Accounts, which for this purpose lump purchases of Treasury debt in with conventional investment by the private sector. The foreign component of “investment” is, accordingly, equal to the total extension of long term investment capital to the U.S. economy. It peaked around the middle of the 1980’s, and surged again in the last two years. In the intervening time, net foreign investment was negative because Americans invested more capital abroad than foreigners invested in our economy. At a superficial level, attracting capital from overseas seems to be a good thing and, by the same logic, investing elsewhere is bad. The rationale for this widely promoted view is that we can draw capital only when we have superior investment opportunities, and conversely American capitalists look elsewhere only when they can’t find anything enticing closer to home.

That proposition is undoubtedly true when applied to real investment by households and businesses, but it bears no relation to borrowing by the government. (It would be applicable to investment by governments, e.g. the interstate highway system, but at the national level there is little or no connection between borrowing and investing). The Reagan-era boom in capital inflows was to a large extent driven by foreign sponsorship of real investment, but the recent inflow is entirely accounted for by foreign purchases of Treasury debt. Since the end of 1988, net foreign investment and net foreign purchases of Treasury debt both totaled about \$300 billion.



Source: Federal Reserve Bulletin

Note: the total shown for 1995 relates to April, 1995, and has been adjusted to achieve comparability with earlier years. The adjustment raised the figure for April, 1995 by about \$15 billion, from \$448 to \$463 billion.

The chart shows what has been going on in one part of this investment – purchases of Treasury debt by foreign governments and international agencies. The last bar on the right highlights the fact that since the start of 1993, these holdings have grown at the rate of about 18% per year, and now constitute about two-thirds of all Treasury debt in foreign hands. The dollar amount of these purchases constitute a very significant part – about half – of the accumulated fiscal deficit since 1992.

The Treasury notes which foreign central banks buy are not in any sense investment in the American economy, although they have a beneficial impact on investment to the extent that they hold interest rates down. They are simply additions to the dollar reserves of the foreign central banks, which build reserves in order to facilitate settlement of exchange transactions. The reason foreign banks have “invested” in our notes is that the dollar is the international medium of exchange. Under the fixed exchange rate system which prevailed before 1971, dollar reserves were held in actual dollars, and earned no interest. But, just as everyone else now demands a market interest rate on liquid assets, central banks demand to be paid interest on their money also. Our persistent debt burden left over from the war and the threat of endless fiscal deficits exhausted the tolerance of foreign central banks, leading to a breakdown of the Bretton Woods agreement. The Treasury would henceforth be required to pay interest on dollars held as reserves. Is another buyers’ strike possible? A recent column which appeared in the Nikkei Weekly is not reassuring:

“Should Japan follow the other Asian economies which seems to be moving away from dollar-denominated foreign reserves? That question was raised by the ruling coalition parties last month. ... [Over the long term, b]oth ruling coalition parties and the Ministry of Finance seem to favor rearranging the basket [of currencies in which reserves are held].” (The Nikkei Weekly. May 8, 1995. P.2. Italics mine.)

The author of this article goes on to explain that dollar assets account for between 80% and 90% of reserves of Japan, with the remainder in Deutchmarks. The lower figure, 80%, equates to more than \$120 billion in dollar assets. Taking the world as a whole, the I.M.F. estimates that about 65% of all foreign exchange reserves around the world are held in dollar assets.

It’s the Deficit, Cognitively Challenged Person.

The accumulation of dollar assets -- Treasury and, to a lesser extent, agency notes – around the world reflects the central importance of the American economy in world trade and the need to have a simple and widely accepted medium of account. That need will always exist, and with good management we can ensure that it will be filled by dollars. But not if we treat the world economy like the golden cat. The new Congress has got it right: it’s about the deficit. The only puzzle is that so many supposedly expert observers could have got it so wrong for so long.

There is a theory which has circulated freely for the last fifteen years that the deficit doesn't matter. Anyone who has either borrowed money or been owed money, and one would think that that would encompass just about everyone since the Flood, knows differently. The reason is that the interest the debtor pays drives a wedge between the fruits of his or her current labor and the fruits which he is actually going to be allowed to enjoy. This is especially true of interest on the national debt, because it is funded by taxes levied on working people and working businesses.

The cost of the national debt is the need to redistribute money from tax payers to bond owners. And since there is no functional connection between the taxes a person owes and the bonds he owns, the relevant transfer is the **gross**, not the **net**, dollar value of the interest cost of the debt, i.e. even for a person who happens to just come out even on the transfer, the burden of the debt is still equal to the full amount of the taxes he pays because *they* go to pay interest to other people. Most of this cost is felt in the distortion of incentives: the person who worked hard to produce the income is not the one who gets to spend it. This cost is, moreover, almost invisible. One manifestation which is visible is the actual cost of collecting the taxes. Historically, the budget of the IRS amounted to one per cent of the total levy, taken off the top, so to speak. Even where it is true that "we" just owe the national debt to "ourselves," there is a very expensive and intrusive Revenue agent mediating the transaction.

Foreign central bankers and American taxpayers alike recognize the impossibility of endlessly piling on public debt. The effect of the debt crisis of February, 1973 are illuminating. In the Treasury auction that month, the yield on long Treasury bonds -- which at that time had a twenty year maturity -- soared to levels not seen previously in this century. We have carried out a very revealing calculation of forward Treasury yields, based on the whole Treasury yield curve. One way to think of the "long term" part of a long term interest rate is by breaking the bond into two parts: one of them a note which matures in the intermediate future and the other a forward bond which will be issued just as the note matures. To buy the bond is the same as both buying the note and committing to buy the forward bond at par. Using sophisticated mathematical techniques, it is possible to calculate the promised yield on the forward bond, and it is this yield which is the true Long Term Treasury rate.

Since the Winter of 1973, the long term rate calculated this way has never fallen below seven per cent, and has averaged around nine per cent. Those findings seem very **unsurprising** at first; everyone is aware that Treasury bonds have offered generous yields for a long time. But in fact these long term rates are shocking. A few months back, in the course of puzzling over the price history of gold, I drew the conclusion that the long term rate of inflation is about four per cent. That is both the actual average rate since 1932 and the rate that the gold market seemed to expect. It follows that the real -- i.e. inflation adjusted -- long term rate of interest has never fallen below three per cent at any time in the last twenty years. This has been **very** expensive debt for the Treasury, and the cost is clearly attributable to a loss of confidence in the dollar.

Against this backdrop, we can only cheer the revolution in public finance which the new Republican Congress is working. At long last someone besides bond buyers, foreign and domestic, is paying attention to the fact that it's the deficit.

Guided Tour of the Logistic Model

Some years ago the economist Burton Malkiel published a book on investments entitled “A Random Walk Down Wall Street,” arguing the case for the random walk theory of security returns. It seemed that not only would a room full of apes with typewriters, supported by a generous endowment, eventually produce the complete works of Adam Smith and Edmund Burke, they would along the way have bested half of all investment managers if they were allowed to invest their own endowment fund. The lengthy debate in finance which the random walk theory stirred has done a lot to advance the science of finance and to benefit people with capital to invest. For reasons both of investment theory and practical observation, however, it is no longer considered the definitive last word that it seemed twenty years ago.

I believe that it is possible to deduce information and rules from history which beat a simple buy-and-hold investment program. The Logistic model embodies the historical research which implements this conviction, and so it defies a simplistic reading of the random walk theory. I will devote this first anniversary issue of the Logistic Monthly to a presentation of the Logistic model and through it, of the logic which underlies our fixed income strategy.

The Initial Expectations of the Research.

It is an old Spanish proverb that great oaks from little acorns grow, meaning that no matter how much the appearance of things flower and evolve – and improve in every way – they can ultimately only fulfill the promise that they started out with. The research we have done on interest rates and spreads has grown out of two simple expectations about what the ultimate product would achieve.

Most important of these is that the historical record would provide reliable readings on the likelihood of events, and on how the likelihoods depend on other, anticipatory events.

This is a pretty minimal expectation, without which there would be little point in doing any research at all. Minimal though it is, however, it provides a logical basis for the only thing that a trader needs: knowledge about the odds of future events. All too often, statistical research gets bogged down in “models” which introduce a lot of extraneous and generally invalid assumptions about how the world works. For example, a model which attempts to forecast future interest rates makes the heroic and highly improbable

assumption that interest rates are, at a quantitative level, a simple function of predictive factors. The formula or “model” which results is virtually guaranteed to be wrong – i.e. to misrepresent the actual relationship between events – because the world doesn’t work by formulae. We do not forecast interest rates because we believe that that is a futile and therefore dangerous pastime.

The objective, after all, is not to know what will be the level of interest rates in the future. A rather more useful goal is to know what combination of trading positions will produce superior trades and performance. Thus we extend our focus to quantifying events which we believe will lead to better trades and better portfolios. Related to this point is a practice of relying exclusively on explanatory factors which come with strong prior credentials. I use our empirical research only to quantify relationships which make compelling logical sense, not to unearth or to justify the existence of relationships. A second expectation deals with the kinds of trading signals which we would find to be credible.

Markets move through a sequence of trading environments – e.g. bullish, volatile, calm, and so on -- of varying length, which dictate the odds of market events. The goal of research is to identify the environment which reigns at each point in time.

It is an observable fact that markets trend, despite the best efforts of the random walk theory to jostle them off course. The persistence of trends violates the random walk in a fundamental way, but surprisingly, it does not violate the more fundamental notion of efficiency. Even if the bond market was perfectly efficient – which I do not believe – price changes would never follow a random walk. The reason is that all trades – indeed all decisions in life – are ultimately backward looking. As much as we may regret our dependence on historical experience, we have literally no choice since, of course, it **is** experience. Under the circumstance, it would be the height of irrationality for a market to react instantly to the first signs of a fundamental change in the environment. Only the accumulation of subsequent experience will reveal the true nature and extent of the change. Trends occur in market during this necessary learning period.

The foremost role of fundamental, empirical research is to sort through the noise to discern the underlying trend quicker and more reliably than the rest of the market does. An important secondary role is to discern states when there is no fundamental reason for trend – when the market is fundamentally in equilibrium – and to lead the trader to ways to exploit that stationary environment also.

Outlines of the Data and Research

With these expectations established, I set out to find leading indicators relating to interest rates and spreads. The period covered by the data is ultimately governed by what is available, but in most cases it comprises the period which starts at the end of 1947 and continues to the present. After losing a few years at the start to allow for lagged effects, this leaves about 500 monthly observations at present (up from about 410 observations

when I started this research in 1987). A truer, but unavailable, measure of the amount of information is the number of different environments which the sample encompasses, including both trendless environments and periods of distinct trend. Since environments persist on average for more than a month, the true number of observations is considerably less than 500, but even so the historical record is relatively abundant.

The raw material available for research consists of Treasury interest rates and Treasury forward rates, for which good data generally exists from 1947 on. The sole exception is that good data on Treasuries with maturities beyond twenty years only became available in the mid-'70's. Data a credit spreads – spreads between Eurodollar deposits and comparable Treasury notes – is considerably more limited, dating from the late 70's. Their rates are not themselves the objects of the quantitative study. Instead, I use them to quantify expectations about events. Events are statements like “the total return on ten years notes was greater than 70 basis points over the course of the month,” and “the yield on one year notes moved in the same direction this month as it did last month, without specifying what that direction was.” The reason for focusing on events is the belief that odds of events change in ways which are consistent and predictable, extracting systematic behavioral rules of interest rates and spreads from the chaotic behavior of the rates themselves.

The probability forecasts, The Logistic Models which appear at the end of each monthly, relate to a fixed set of events. For ten year notes, i.e. long rates, and one year notes, i.e. short rates, the events are that: 1. The note outperforms the three month bill by more than a fixed threshold over following month, and 2. that it will underperform by the same threshold amount over the month. For the swap spread, the events are that a Treasury note will outperform an equal-maturity Eurodollar deposit by more than a fixed threshold, or will underperform it, over the coming month. The Swap Spread is the (negative) spread of the Treasury over (actually, under) the corresponding Eurodollar. When the swap widens, Treasuries yields are rising relative to Eurodollar rates – i.e. the spread is getting less negative. Since Eurodollar rates are indicative of credit spreads in general, a widening swap spread is a sign that credit spreads are narrowing. The thresholds I use are based on history, being chosen so that the corresponding events in each case occurred about 30% of the time. While there is no cosmic significance in the exact level of a threshold, they are high enough to identify large, meaningful events in interest rate markets.

The explanatory factors are of several broad types: conventional economic data, monetary data, inflation expectations, international factors, and some technical factors. By technical factors I mean variables based on past interest rates and forward rates. An example of this type is the slope of the yield curve, measured as the ratio of the yield on thirty year bonds to the yield on one year notes. The models of Treasury rates contain thirteen factors drawn from these categories. It is crucially important to limit the number of predictive factors, because the number of events – the number of distinct environments in the last 500 months – is limited. All validity would be lost by using as many factors as there were events. This constraint applies, moreover, not only to the number of factors – thirteen – which wind up in the final model. It actually applies to the total number of

factors which have ever been tried! In the case of the interest rate models, that total is fourteen; one original factor became obsolete and had to be reformulated.

Findings on Gold.

Two factors – based on the price of gold and the money supply – have consistently high correlation with the probability of significant changes in interest rates and spreads. I have summarized the basic facts on gold in the following table, leaving the monetary effects for another month. This table replaces our familiar Logistic centerfold this month, and reflects our commitment to readership diversity: we do not discriminate against persons who are fascinated by columns of figures.

Gold Trend

Gold	10 Year Note			1 Year Note		
	Rally	No Chge	Retreat	Rally	No Chge	Retreat
+1	19%	31%	50%	9%	35%	56%
0	28%	41%	31%	20%	52%	28%
-1	40%	43%	17%	39%	50%	11%

The gold trend factor is the most telling indicator of whether bonds are fundamentally poised to rally or to retreat, because it is the best available measure of inflation expectations. The difference between a high positive trend and a highly negative trend is a difference of 30 percentage points in the odds that one year notes will rally and a difference of about 20 percentage points in the odds that the ten year note will rally. Not surprisingly, the effect is symmetrical: as the odds of a rally fall, the odds of a retreat to higher yields rises.

The linkage between gold and interest rates is strongest for one year rates and attenuates at longer maturities. This is evident from the table when we compare the impact of moving from no trend to a negative trend – the comparison between the last two rows. This is precisely what one would expect, because the ability to forecast inflation – or indeed to forecast anything – must decline as the horizon extends. Short term rates are primarily driven by forecasts, while long term rates are less sensitive to forecasts and more sensitive to *risk premia*. A risk premium is simply the difference between the odds you assign to any event and the odds which you would demand before you would wager actual money on the outcome.

The gold trend is by design a slow moving factor. Periods of significantly positive or significantly negative trend occur rather infrequently, and they last for several months once they get started. Gold has not exhibited a positive trend since the price topped at around \$500 per oz. In December, 1987. Periods of significant negative trend have alternated with trendless times – like the present. The longest negative trend covered

essentially all of 1989. The six episodes have had an average duration of about six months, and account for about one third of the subsequent eight and a half years. The pivotal importance of this factor naturally imparts a high degree of stability to our views on domestic interest rates.

This is in my view *good* stability: good in the sense that it follows from a highly stable predictive factor. It is not that same thing as forcing stability, or inactivity, as a matter of policy. *Bad* stability comes from a policy based on distant forecasts: i.e. from a belief that one knows more about where a market is headed over a rather long run than he is willing to claim in the short run. That belief is usually expressed in words like “I’m sure short rates are headed higher but who knows about the near term.” The reality is that it is literally impossible to know more about the long term than about the near term. To take the example of the gold trend, since 1987 the average trend has lasted for six months, but the shortest one was only in place for one month. The only sensible policy is to wait and see how long the “long run” lasts.

Guided Tour of the Logistic Model, Part 2

Last month I started a guided tour of the interest rate model, starting off with a tour of the cellar – the foundations and a glimpse into the gold vault. This month we will move up to Chairman Greenspan’s study, on the ground floor.

From the founding of the Federal Reserve System in 1913, the Board has been charged with the job of regulating interest rates. Some of its early successes are taken for granted today. Its first major achievement was to create a single, nationwide credit market. Prior to that time the banking system had done a very imperfect job of equilibrating supply and demand across the regional markets, with the result that interest rates varied significantly from place to place in response to local supply and demand. In so doing, the Fed helped to establish a national money market, while leaving the banking industry in a highly decentralized – actually, fragmented – state. As important as that achievement was, the revolution in communication and information processing have cemented in place a purely private sector network of financial intermediaries which has largely taken the Fed out of that job. With that victory solidly in place, the Fed moved on to the more challenging job of managing its new creation.

The Fed arrives this point in history with a somewhat confused tangle of priorities for our central bank and an abundance of different goals clamoring for a place at the table. There are probably some Keynesians somewhere – since last November they are harder to find on Capital Hill – still muttering about an illusory “full employment,” but the duties of the central bank are all about the cost and the value of money. During the term of Chairman Greenspan, the Board has achieved a respectable degree of predictability in inflation, and that represents a significant improvement over earlier days. Inflation has not been particularly low; it has actually been right at the long run average of 4% per year. But by restraining the rate to a fairly narrow range, the Board has instilled a high degree of confidence that inflation is not going to spin wildly out of control. The reward for its labors has been a steady deflation of the real interest rate.

Money Supply and Interest Rates

The research behind our logistic models implies that two things happen when the Federal Reserve System creates a lot of money. First of all – this is no shocking revelation – short term interest rates fall. Interestingly, the full effect is realized only gradually, so that money supply is a leading indicator of the direction that short rates will

take in the future. The surprising part about this is how long the adjustment takes; though as traders we don't mind having plenty of advance warning. The length of the adjustment also places a burden on the conduct of monetary policy, in as much as the eventual effects of policy will not be observed until long after the policy is adopted. This is the reason why Milton Friedman has always encouraged the Board to adopt simple, consistent rules rather than to practice fine tuning, and in recent years his counsel has wisely been followed.

Aside from the direct effect on short term interest rates, monetary policy has a decisive effect on the volatility of interest rates, and probably on the volatility of stocks and other financial assets too. Following periods of rapid increase in the money supply, *all* interest rates are more volatile than normal, and following tight money, they are less volatile. I have assembled the quantitative evidence behind these two conclusions in the following table, which is extracted from our Logistic Model. The three rows correspond to three scenarios: rapid growth of the monetary base – +1 – average growth – 0 – and slow or negative growth – -1. The last set of three columns relate to the odds of subsequent events in the yield on one year notes. Focusing on those columns, we find that moving from a regime of tight money to easy money dramatically raises the odds of a rally in short rates: from 11% to 33%. Even more dramatic, however, is the fact that the odds they will stay within a narrow trading range fall from 67% to 37%! Evidently, short rates trend lower, but the route is a bumpy one. For long term rates the statistics are even more striking, because the only significant effect is on volatility. A regime of easy money raises the odds of higher rates and those of lower rates about equally, while the odds of staying in a narrow band fall by about 20 percentage points, from 54% to 33%.

Growth Rate of the Monetary Base

Gold	10 Year Note			1 Year Note		
	Rally	No Chge	Retreat	Rally	No Chge	Retreat
+1	34%	33%	31%	33%	37%	30%
0	28%	44%	28%	19%	56%	25%
-1	22%	54%	24%	11%	67%	21%

The basis for these statistics, as explained last month, is a quantitative study of the behavior of interest rates over the period from 1953 to the present. The odds quoted here, and the ones which appear on the back page every month, are our estimates of the probabilities of events over the following month. The total effect of a positive or negative trend in the money supply is therefore larger than these probabilities suggest, because a trend, once established, generally stays in effect for many months, and each month the market gets a fresh set of dice.

Post Hoc or Propter Hoc?

This statistical summary of the last forty years establishes that after the Fed eases, short rates move in the expected direction and interest rates are more variable than usual. This obviously does not prove that volatility is caused by easy money; *post hoc* is not the same as *propter hoc*. It is not entirely implausible that monetary policy responds in advance to expected volatility: extending liquidity to soothe troubled markets. I don't know what to make of the apparent corollary: does the Fed tighten to add excitement to otherwise boring markets? The evidence we have does lend some support to a finding of causation. First of all, it takes a rather long time -- one year, as we measure it -- to establish a trend. If the alternative explanation is that the Board merely anticipates rocky times and responds in advance by providing extra liquidity, they must have excellent foresight.

Some related statistical research reinforces the point. Our model includes a factor -- the change in net borrowed reserves -- which identifies short term shocks in money supply. Short term shocks bear the same relationship to volatility as the trend does: volatility is higher after the Fed extends reserves to the banking system and is lower after it drains reserves. The correlation, however, is weak, and that is the important point here. No matter how farsighted the Board is, it must certainly have the clearest picture of market volatility immediately before it hits. If it was merely anticipating, therefore, near term actions would have the **highest** correlation with volatility, not the lowest correlation with market volatility.

Is there any theoretical reason to believe that aggressive money supply would cause market volatility, and that tight money would reduce it? We are not willing, after all, to rely on statistical evidence which doesn't make good economic sense. The reason that I proposed last March has to do with the value of liquidity. Short term interest rates are the value of availability of funds -- i.e. the value of liquidity. Extending liquidity is a rather low-risk way of earning a living. It is the one which has always been associated with conservative bankers, after all. When the wages of liquidity are generous, it tilts the risk-return trade off against more risky investments. When the wages of liquidity are scanty, capital has to go searching for return and risk, and the first stop is financial markets, because they are large and readily available. Long term investors put capital to work by buying assets to hold, but traders put capital to work financing trading positions on both sides of the market. Both risk and return are functions of the sheer magnitude of price changes, but not on the direction. Pumping up the trading capital (temporarily) increases the staying power of the losers and emboldens the winners, which naturally leads to larger price swings in every direction.

Energy Futures

Legend has it that the early advocates of nuclear power predicted that it would lower the cost of electricity virtually to zero, or in other words, even if we can't offer you a free lunch, at least we could warm it up for you at no additional cost. In recent years the public seems to have had so little interest in free electricity that it has collectively wished the whole business off to a corn field somewhere. It comes as something of a surprise, therefore, to find that nuclear power is the growth component of the energy industry.

False Start.

It is not hard to see the fundamental attraction of nuclear power: the fuel it depends on is available in almost limitless quantities. All commercial nuclear generators in America today use enriched uranium, which is not very abundant. From the very beginning, however, the capability existed to create more fuel as a byproduct of the reaction which releases usable energy. The potential has been recognized for a long time. Twenty-five years ago – before we ever imagined that we had an energy crisis – it was estimated that the breeder reactor could fuel itself for several hundred thousand years. In an issue of the Scientific American devoted to an inventory of energy sources concluded at that time there was no prospect of running short of energy, and that if the world had anything to worry about, it was global warming caused by the consumption of ever greater quantities of energy.

It was the misfortune of nuclear power that it entered the world as a byproduct of nuclear weapons. Without doubt, the two major military powers promoted atomic energy as a way of providing a steady supply of weapons material. For this reason, what came to be viewed as the problem of spent fuel was initially the promise of nuclear weapons, and military uses happily absorbed all the waste they could get. Early on, however, it became apparent that they had enlisted the help of the sorcerer's apprentice, who according to legend could start the magical salt mill but couldn't stop it. In this case the mill spewed out Plutonium and contaminated steel. It was comparatively easy for rational men and women to see through the insane logic of mutually assured destruction, but no amount of rationalization could stop the steady accretion of bomb material seeping from the world's nuclear powered generators. Nuclear weapons became a captive of its servant -- the nuclear power industry -- until stockpiles of weapons reached ludicrous proportions. It was variously estimated a decade ago that the Soviet Union, late but not lamented, possessed between thirty and fifty thousand atomic warheads. The Kremlin must have been praying for an invasion by aliens from outer space, because even the most gruesome

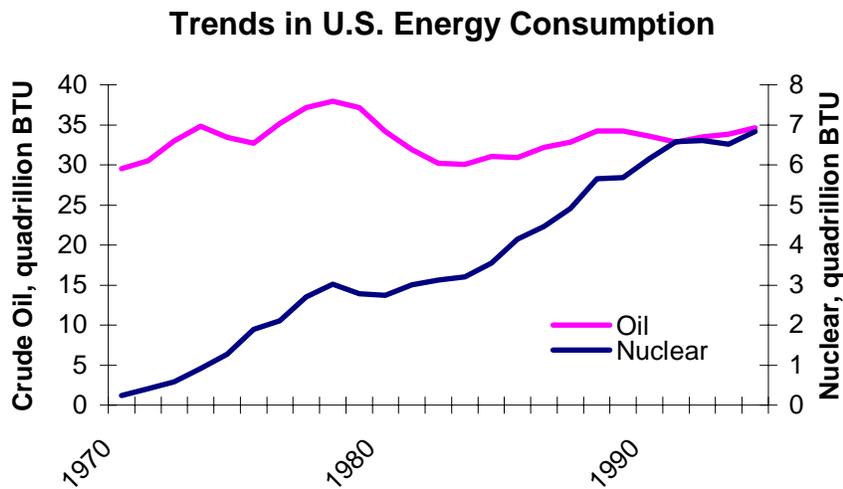
Strangelove could hardly find any terrestrial military mission for one tenth of that number.

There was no way that the application of nuclear power could expand without first solving the problems of spent fuel and contaminated power plants. And the solution could not rely on accumulating more and more spurious nuclear warheads. It is remarkable how much progress has been made in that direction at places like Argonne National Laboratory, in Illinois, and at CERN, in Switzerland.

Trends in Commercial Nuclear Power.

Judging from the public perception of nuclear power, it would be natural to surmise that these problems had proved to be insurmountable, and that nuclear power was a promise that would never be fulfilled, but the reality is very different. By no means have all the dangers been overcome. The steady accretion of technical knowledge and simple experience has, however, smoothed the way for a rapidly growing dependence on nuclear power.

The United States has ceded its early lead in nuclear technology, but as the following graph shows, it has not missed the trend. The graph is designed to highlight the relative trends in the importance of petroleum and nuclear power in the total energy supply, and in doing so it goes a long way to explain why we worry a lot less about supplies of crude oil than we did twenty years ago.



Source: U.S. Department of Energy, Annual Energy Review 1994

The amount of crude oil consumed in 1970 -- the energy equivalent of 240 billion gallons of gasoline -- provided more than 100 times the energy derived from nuclear power. By 1994, Oil consumption has increased by about ten per cent, but relative to nuclear power, it represented only five times as much energy. Energy from nuclear power has doubled since 1984, while consumption of crude oil has hardly grown at all.

This trend is not an American anomaly. Trends in worldwide fuel consumption are almost identical to those in the United States. The world as a whole derives about the same percentage of its power from nuclear as the U.S. does: about 6% of the total. The spread of cars and trucks in the developing world caused oil consumption to grow about 12% since the so-called Arab oil embargo (which was actually an American oil embargo). The developed world has accommodated almost all its growing need for power by generating more electricity, and nuclear has been the fastest growing source of electricity. On a world basis, electric power from nuclear energy has grown more than 900% since the oil embargo, starting from an admittedly small base.

Technology Fix or Ecological Disaster?

Twenty-five years ago the Club of Rome, whose aspirations for socialist central planning lent an ominous tone to the term “club”, pronounced rather confidently that the world was inexorably running out of everything. Future generations could expect only to inhabit a wasteland worthy of the Twilight Zone. It’s amazing how quickly the future becomes the past; even Twilight Zone reruns are now relegated to offbeat cable channels. The forecasters hired by the Club of Rome foolishly discounted how decades of patient scientific research and practice would transform commercial nuclear power. It is important, however, to keep in mind that their vision of the future was not entirely inaccurate.

No lapse better illustrates their tunnel vision than the evolution in the way the world deals with Plutonium. Plutonium hardly occurs in nature, where Uranium is allowed to decay to Radium at its own leisurely pace; for all practical purposes, Plutonium is uniquely the result of accelerating nuclear fission in a reactor. And it is a big practical problem, both because it is the starting place for nuclear weapons and because it is potentially a very dangerous chemical, though just how dangerous Plutonium is to human beings is a question which is now shrouded in controversy. A recent story in the Atlantic Monthly summarized the results of a lengthy study of men who had been exposed to Plutonium in the early days of atomic energy, and concludes that they show no adverse affects to their health. Even if small doses are harmless, it is necessary to adopt a process which consumes Plutonium once and for all. The rest of the world now reuses Plutonium for electric power, a process called recycling, in breeder reactors. At this time, only the United States insists on trying to dump its Plutonium in the ground, but inevitably we will adopt the common practice, as the hazards become more clearly understood and the methods of managing them become routine.

As wrong as the alarmists were about nuclear power, however, they seem to have been pretty accurate about the future of petroleum: that in the future it would be a declining contributor to the total energy supply. As mentioned above, world consumption of petroleum has increased rather little over the last twenty years. Thanks to improvement in fuel efficiency of cars and trucks, the same amount of fuel stretches over more miles today. As the real price of petroleum has fallen from its peak in 1980, producers have throttled back production. This is the reverse of the scenario painted by alarmists of

twenty years ago, in which only drastic leaps in the price of oil would suffice to ration the dwindling supply to its highest and best uses. Instead, conservation has been achieved not by the economist's Law of Demand – higher prices restraining consumption – but by the Law of Supply – lower prices discouraging production! In either case, this has the effect of conserving oil reserves – which are ultimately finite – for future generations.

Looking out to the long term future of petroleum prices, it is now very uncertain whether the end of the petroleum age will come, in Malthusian style, with desperate consumers fighting over the last barrel, or will it come on a dusty oil derrick somewhere which keeps mindlessly pumping on, long after anyone even cares.

Capitalism and Freedom

It is almost twenty years since Milton Friedman ignited the public with a television series titled “Free to Choose.” He used a variety of graphic examples of economic success and economic failure to bring into focus the creative energy of free markets, and to contrast it with the poverty and frustration inherent in centrally planned economies. It would be hard to imagine either a more direct or a more effective critique of the legacy of the New Deal, because – true to Professor Friedman’s roots as an empirical scientist – it swung the camera away from the stale drawing room discussions of economics and politics and fixed it squarely on the realities of daily life around the world.

The time is almost upon us for a proper celebration of the actual twentieth anniversary of this achievement but, in the tradition of the Mad Hatter, who never needed to wait to celebrate an impromptu un-birthday, there is no need to wait for that exact moment. And no time could be more appropriate for this topic than the month when the Congress is debating a transformation of federal welfare programs.

I’m from the Government ...

Nearly everyone knows the finish of that gag line. If you happen to have missed it, let me assure you that the check for your prize money is in the mail. The libertarian tradition of American political thought, so consistently and articulately expressed to Professor Friedman, has always been associated with skepticism about the effectiveness of government solutions to everyday problems.

Within the realm of purely economic matters, the Full Employment Act of 1946 represents the high water mark of New Deal ambitions. Its premise was that thanks to the new science of economics it would be possible for federal authorities to ordain full employment across the land. The mistake the act embodied was not in believing that the federal government could or should take steps to put people to work. There are clearly occasions when that would be both possible and desirable. The hypothetical example most frequently cited by Libertarians is to a city under siege, whose streets are flooded with refugees from the countryside. In the interests of public safety and in fairness to the displaced persons, the government of the city would naturally act to put them to work on projects necessary to the survival of the city, and would ensure that their labor earned

both kept them busy and provided a livelihood for them. As long as the crisis lasted, there would be little question about what the surplus labor should be doing and why.

The crisis atmosphere of the Depression era seemed to justify measures of this kind, and the world war amply reinforced it. But a large country is not a city, and the fact of unevenness in the pace of business is a far cry from a war for survival. In an early critique of the pretensions of the Full Employment Act, Milton Friedman argued that the complexity both of the national economy and of the process of democratic decision making would render economic policy ineffective or, more likely, counterproductive. The kernel of his argument was not philosophical; he readily granted the benefits which an effective policy would bring. It was pragmatic, and based on his study of how recessions and depressions actually occur. In practice, they creep up on the economy over a period of many months, with each month's bad news being almost entirely unanticipated by what preceded it. From a purely logical point of view, a recession could hardly arise any other way. As all economists, including Keynes, recognized, a recession can occur only because it is not anticipated. His analysis proceeded from that point.

It follows of course that the federal government could not act in advance, to forestall an impending recession, any more than an individual business executive could act in advance to ensure that his enterprise sat it out. The federal government has no more information than the executives do, and certainly it does not have any greater incentive to use the information it has. If businesses consistently sidestepped recession, however, there would have been no recession to begin with. The government would thus be limited to playing catch up, just like everyone else. But a government, argued Mr. Friedman, is singularly ill suited to playing catch up because of the slowness of its deliberations, and that slowness is inherent in making decisions for the country as a whole. The historically average recession has run for about a year and a half. If it took the government a year to devise and implement a cure, the recession would nearly be over by the time the medicine reached its destination. And if, moreover, the cure was like most government programs, which never die, its effects would be concentrated in the recovery phase which was bound to come anyway.

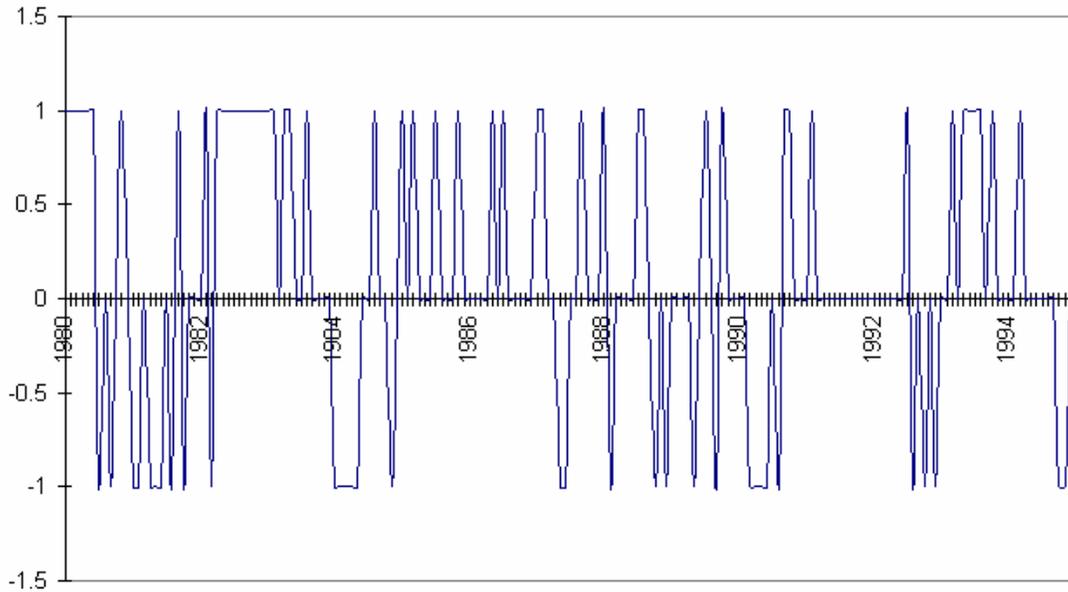
The New Economic Science.

The authors of the Full Employment Act were not unaware of this criticism, but hung their rebuttal on the premise of the new science of economics. No economist – and certainly not Milton Friedman – would deny either that economics is a science or that new methods of systematic observation and analysis have transformed it into a practical tool for understanding economic relationships. But the needs of full employment demand not only a relative improvement – that economics be more scientific than it was a century ago – but a high absolute level of completeness. It is easy to test directly whether this level has been reached. One very good test is to look at the success rate of the Commerce Department's Leading Economic Indicators. This series is by far the most thoroughly tested and most widely followed indicator of the economy, embodying nearly all we

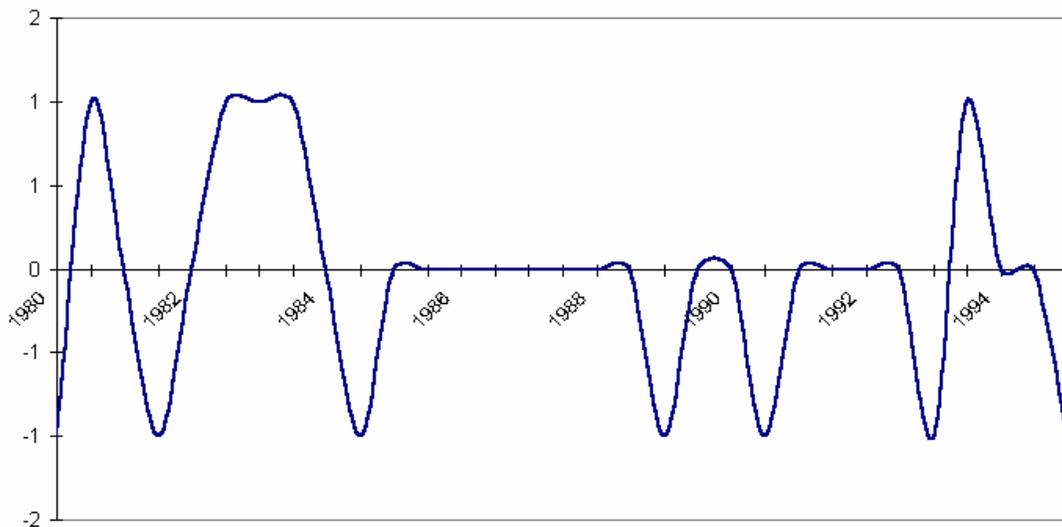
know about the business cycle. What follows are two graphs which bear on the reliability of the Leaders.

The graphs are intended to test how much information a single observation of the Leading Indicators contains. They differ from each other in the time period of the observations: the first graph is based on month-to-month changes and the second is based on changes over a period of six months. Obviously, we have six times as

Upticks and Downticks of the Leading Indicators



Upticks and Downticks of the Leading Indicators: Six Month Intervals



many sightings of the first kind than of the second kind, which is why the chart is so much busier. What the graph shows are zeros and plus and minus ones. A plus one occurs when that observation of the Leaders, e.g. the percent change since last month, is significantly higher than the historical average change. A minus one signals a smaller-than-average (or negative) change, and zero signals about an average rate of change. The historical reference points come from the period before 1980, which is when these charts start.

The two charts show two important facts. First, the Leaders do work, sort of. The recessions in 1980, 1982, and 1989-1990, and the boom in 1984 are quite discernible. They are far from perfect, however: they missed the wild boom year in 1987 and they pointed toward a recession this year. The other essential fact is the very poor reliability of the indicator based on monthly changes. Anyone who simply followed the most recent number would have been whipsawed many times over the last fifteen years, because even the worst recessions contain some months of plus ones and the booms contain minus ones. The inescapable conclusion is that while the new science of economics reveals, by its methods of pooling many sources of information, more knowledge about the future than any individual could ever have known, it is not reliable enough to justify the pretensions of the Full Employment Act. And especially since these indicators are only available today, half a century after it was enacted!

...And I'm Here to Help.

In a recent public statement, the President promised to do more to make Americans more happy. The latest cant from Washington is that even though we are as a nation more prosperous than we have ever been before, we are still not a **happy** people. And, more importantly, Uncle Sam is going to do something about that.

What can he do?

In 1946 I suppose the war-weary public thought it would not be happy because it didn't have full employment assured as a birthright. Today we have employment at a degree of fullness which would have been unimaginable fifty years ago. No one would have believed that such a large fraction of the adult population could be gainfully employed as are employed today. Although the goal of eliminating fluctuations in employment has proved elusive, one would have to judge that the goals of the Full Employment Act have been attained. In fact, of all the hopes and pretensions of the New Deal, the only one which has most nearly been achieved is full employment, but the one which has **not** been realized is that the federal government is going to make us happy.

Liberty and Freedom.

The proper goals of the federal government are hardly a mystery. They are stated clearly in the Declaration of Independence: to ensure the observance of inalienable human rights, among which are the rights of life, liberty, and the pursuit of happiness.

These demands encompass promoting prosperity – and even providing work directly, as in the example of the city under siege – because poverty is a kind of slavery: slavery to the daily need to get by. Poverty, moreover, leaves people vulnerable to exploitation by anyone who can offer a measure of economic security. While most Americans enjoy a high degree of liberty, some still do not. One form which the right to liberty takes is a kind of equality among people, which prevents a powerful few from manipulating a powerless many. This liberty we have for the most part achieved. If there is a glaring exception, it is among the urban poor who are captives of a politically-motivated welfare system which traps them in poverty to deliver safe votes for neighborhood political bosses. It is ironic that it was the poorest residents of Washington, DC who turned out to put Marion Berry back in office, although they have by any measure benefited the least from the machine which he represents! The time has come, as Speaker Gingrich asserts, to break the cycle of welfare dependence and set these people free.

This is the Liberty which is a political right, having to do with the relationships among people and the relationship of people to the institutions of society. Freedom, by contrast, is something which cannot be guaranteed by law, but which all people naturally want to be happy. Freedom is an entirely individual quality, because it refers to the actual ability to do something. Though related to liberty, it is not the same thing, as a simple example illustrates. A caged bird would be free to fly if only the owner had not taken away its liberty to do so. An hippopotamus in the wild, by contrast, is perfectly at liberty to fly, but it is not free to do it. President Clinton and Speaker Gingrich can use their positions to enhance my liberty and yours, but they cannot make either you or I free. That is something we have to do for ourselves.

Prices Vary

Prices vary. Bonds and dollars are up and industrial raw materials are down, to cite just a few pertinent examples. That's hardly surprising; the fashionable length of men's hair and the correct number of buttons on a dress jacket vary too. More to the point, the range over the last two years of bond prices and bond yields has been exceptional. Thus it is timely to ask what's going on in the high fashion world of dollar-denominated financial assets.

Rally Time.

The engine of the most recent rally, which started around the end of August and to us shows some signs of exhaustion, seems to lie in Tokyo. Obviously concerned about the shocking rise in the yen this year, the Ministry of Finance, working through the Bank of Japan, adopted a policy of lending yen for the purchase of U.S. fixed income securities. The yield arbitrage is enormous, since the cost of funds is nearly zero. Adding on the combined effects of our bond rally and the dizzying dollar rally, playing this game has been a bonanza for Japanese financial institutions. The total return in yen on an investment in long Treasuries has exceeded 35% in just three months. Based on the generous offer of as much as \$40 billion for this program, the profit would have amounted to around \$15 billion for Japanese financial institutions at today's exchange rate. The actual extent of participation to date was probably less than the full \$40 billion, but as long as Treasuries retain the kind of huge yield advantage they now possess the program will continue to be interesting.

It seems safe to surmise that these results have made the Minister of Finance a hero among both the management and depositors at these institutions. If I had been a depositor, he would certainly be one of my heroes. This action was almost equally welcome on this side of the Pacific, because our domestic *real* interest rates are significantly above normal long term levels, even though they have fallen nearly fifty basis points from their recent high, posted in the middle of August, and twenty-five basis points since the middle of summer. Nominal interest rates have fallen much more than that -- the long bond has rallied almost eighty basis points since the middle of August -- but the drop in real rates has been cushioned by the simultaneous drop in inflation.

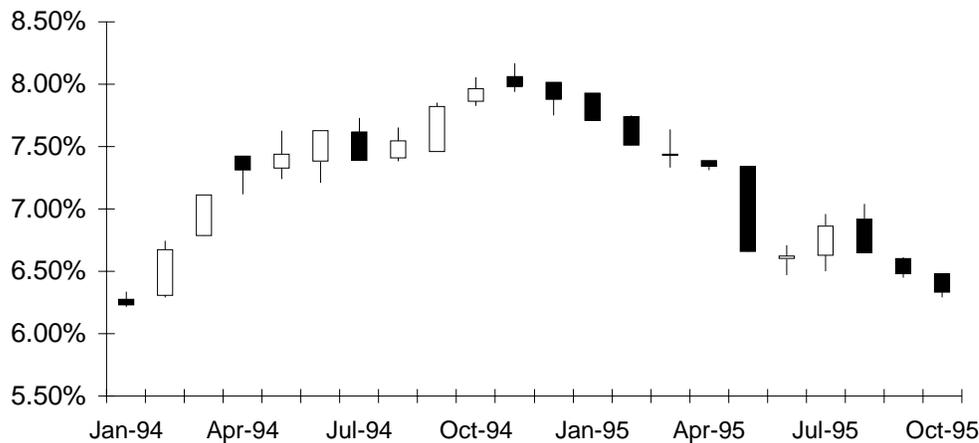
This combination of events has played very well for us, because for the last several months we have consistently postulated that the curve would flatten at lower long term rates. What turned out to be a significant rally has waded through some very rough

going, however, raising the question of how volatile yields normally are, and whether the recent experience is somehow exceptional in this regard.

Background on Yield Volatility.

The Logistic centerfold this month summarizes the history since January, 1994 of yields on long Treasury bonds. This sort of chart is called a candle chart, and it is designed to highlight the distribution of yields which were recorded each month. The graph has two parts: a set of vertical lines and a set of boxes, which are drawn on top of the lines. In any given month, the line covers the full range of yields recorded during the month using daily closes, while the box covers the range from the first day of the month – the opening yield – to the last day – the close. Since the highest and lowest yields do not generally occur exactly at the ends of a month, the vertical line usually extends above and below the box. Based on this description, there would be no way of knowing whether the month started at the low end of the box or at the high end. That bit of information is conveyed by the color coding of boxes: a white box indicates that the month opened at the bottom of the box – i.e. that yields rose during the month – while a black box indicates the opposite. While the resulting graph lacks much of the graceful elegance of a simple curvilinear plot, its chunky factuality is well suited to convey information about both the trend and volatility of yields on a month by month basis, perhaps more of an X-ray than a photograph of the subject.

U.S. Treasury Bond: Yield History since January, 1994



Note: Yields are daily closing quotes for the then-current 30 year Treasury bond. The observation for January, 1994 reflects only the second half of the month.

One question positively leaps off the paper: Why did long rates spend eleven months rising from 6.25 % to 8.25%, only to reverse over the following eleven months and return almost precisely to where they started? What is it the world saw so clearly in May, 1995 -- when yields fell by sixty basis points – that it could not have anticipated eight months earlier, when the long Treasury yield topped 8% ?

The easy answer is that the bond trading world must have seen a lot, and that it is none of our business to demand explanations. And there is no doubt great wisdom in that retort, but the question will not be so readily dismissed. A lot has happened since yields peaked a year ago – among other events, the policy shift in Tokyo referred to earlier – which no one could have anticipated last Fall as Treasury bonds were sinking. But last Fall anyone could have anticipated – indeed, should have known for sure – that the future would be full of surprises. Is there a kind of trading myopia which numbly extrapolates the latest headlines into the future, without taking account of how little information today’s headlines convey about what that future holds?

One piece of evidence we have uncovered suggests that the last two years have not been unusual. We took a purely statistical look at month-to-month changes in bond yields since 1971, a period which looks a lot like the last two years because yields have come full circle and are now at their 1971 levels. Using the average month-to-month change as a standard, we found that there have been more large changes, and correspondingly more small changes, than a normal distribution would warrant. We accordingly tried a more complicated model which allowed for a draw of some observations from a low volatility distribution and some from a high volatility distribution. Our conclusion was that a little more than half the time, month-to-month yield changes were drawn from a high volatility distribution which produces an average net change of about 37 basis points per month (i.e. a standard deviation of 46 basis points). The rest of the time the average change was only 13 basis points. Knowing this history, as any experienced bond trader would, there is nothing especially suspicious about an occasional fifty or seventy-five basis point trading range within a month.

Supply, Demand, and Information.

The preceding discussion took the point of view of conventional finance theory: viewing the market as a homogeneous trader / investor who regularly adjusts his bid to reflect incoming information or misinformation. There is another view, which recognizes that participants in the market possess different information and, to an even greater degree, different opinions. The ebb and flood of prices is then understood as reflecting the tug of war between bulls and bears. In this view, information is still important. It is in the continuous bidding process that the bulls and bears learn from each other, and jointly forge the new consensus into market prices. But this perspective expressly accepts that not all price volatility is tied to new information; some of it is caused by mistakes made by bears and bulls. The presence of disagreement presumes that practically all people are only partially informed, so mistakes must be commonplace. (I say “practically all” for the sake of the touchier egos out there.)

If we summed up all the price changes which have occurred over some interval of time, but taking only the magnitude of the change, without regard to whether it was positive or negative, we would have a measure of the total variation which must be accounted for. In an *efficient market*, all of this variation would be explained by the flow of new information into the market – that is the definition of a perfectly efficient market. In an ordinary, garden-variety market, some part of the total variation must be attributed

to the market process itself: to the temporary effect which buy and sell decisions have on market prices.

The appropriate question is then one of degree: how much of the volatility of bond prices comes from genuine information and how much comes from the market process? The evidence we have looked at is *not* very reassuring, for the following reason. Referring back to the chart, the candle chart draws a neat line of demarcation between the net change in yield over the course of a month, on the one hand, and the gap between the intra-month high and low, on the other. As a rough approximation, let's assume that the net change over the course of the month occurs because important new information has arrived. The difference between the high-low range and the open-close range, then, would be a measure of the contribution of the market process itself to the volatility of prices within the month. Thus, for instance, we would attribute the entire, enormous decline in yield last May to bullish new information, because the bond opened the month at the high yield and closed at the low yield. The next month, by contrast, we would conclude that no new information arrived, and that all variation in yield was caused by the market.

One might object that this measure ignores genuine, but short-lived, information which arises during the month, but is soon contradicted by still newer information. This certainly happens sometimes, although I'm not sure what to make of "information" which has such a short shelf life. In any case, we can finesse this quibble by shortening the unit of observation from a month to a day. Toward that end, we have studied the daily open-close / high-low data for the Treasury bond contract over the period from July 23rd to October 26th of this year. The intra-day high-low range averaged \$944 per contract, while the open-close range averaged \$491. The difference, \$453 per contract, is how much it cost on average to buy at the high for the day and to sell at the low. I don't think I need to elaborate on how profitable it was, therefore to be a market maker, *selling* at the high and *buying* at the low.

The implied \$453 bid-ask spread cannot be taken at face value. It would have to be deflated by an adjustment for volume and also adjusted for the fact that some of the trades at the extremes took place between market makers. Nonetheless, I would be willing to wager that a very large bid-ask spread would remain after these corrections, and that justifiable concern would remain about the degree of market efficiency (or "liquidity", in the parlance of the futures markets). Prices of financial assets are supposed to vary, but they are not supposed to vary (too much) as a result of the order flow from bulls and bears.

Aside.

One of the topics which the recent U.N. conference on women proposed to discuss was the discovery of three new genders. Apparently the two familiar old genders had triplets. I suppose this makes for a nice bourgeois family of five, but I must say I had no idea genders were so prolific, and I worry a bit what will happen if the kids start to spawn. Perhaps the U.N. should worry more about population control for genders and less about population control for human beings.

Investments and Financial Services

The art of portfolio management is to turn investments into financial services. This is the subject matter of a whole raft of investment advisors, newsletters, and the like. And, more controversially, it is the ultimate aim of financial engineering, notwithstanding the evil reputation which financial engineering has acquired in the last ten years. This month I am going to stake out some turf solidly in the middle ground between conventional investment counsel, on the one hand, and hell-for-leather financial engineering on the other hand, to step through an revealing example of portfolio management, and through it to illustrate what portfolio management is capable of, when approached from the point of view of financial engineering.

The Setting.

The difference between investing and financial services is approximately the same as the difference between investing and saving, because savers are the primary consumers of financial services.

An investor is someone who needs money now to meet business expenses for a product which he will sell in the future. Even if the investor is not strictly a business – if for instance it is a city which desires to build new schools – its position is not really very different from that of a business. They are all instances of needing money now to pursue a project which one will not be able to justify financially until some later time. What the investor brings to the financial market is the economy of prepaying expenses: that by meeting expenses in advance he can hold the cost down to a level below the ultimate worth of the endeavor. In the case of the labor that the investor pays for work-in-progress, this economy comes about because the laborer vastly prefers cash money in hand to mere company scrip which promises a share of the eventual product. As important as raising investment capital is, it is only a small and nearly tangential part of the investor's business. The investor's first priority is to manage a complex project, and so can not concern himself with the needs of the parties who provide the capital. His accountability begins and ends with achieving a promised level of profitability.

On the other side of the table are arrayed the public – individual persons and institutions – which are saving for some purpose. Savers come in two very different varieties: those who *must* save and those who *want to* save. The difference is not readily apparent from saving behavior. Savers are alike in that they have pools of investment

assets which they add to both by letting the assets grow in value and by adding to the pool a part of their current income. The similarity masks a vast difference in what they consider to be risk.

For a saver-by-necessity, risk has the very precise meaning of not having accumulated enough assets to meet some future obligation when it comes due. For this kind of saver, *controlling* this *risk* is the overriding concern. Almost all savers-by-necessity are businesses, because the “necessity” most often arises either from business liabilities like employee benefit promises, or contractual obligations made by insurance companies to policyholders. Managing a savings program of this kind is a familiar exercise on portfolio management, but one which is nonetheless often misunderstood.

The Trap Called “Take More Risk Because the Plan Will Be Around for a Long Time”

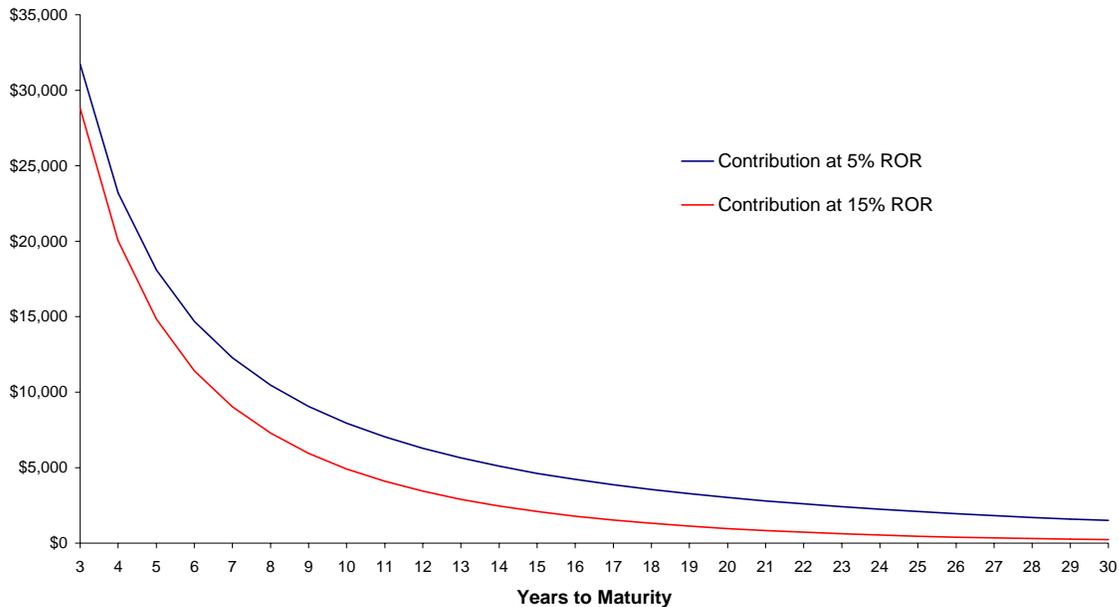
I want to step through the broad outlines of a way of thinking about this portfolio problem, and along the way hopefully to correct a common but dangerous misconception about how much risk this kind of plan can or should take. I will assume, as is almost always the case that the plan is partially, but not fully, funded, i.e. that existing assets are not sufficient to cover all expected outlays.

Every financial advisor instinctively and correctly urges the clients to investment long term funds in more aggressive sorts of assets: those with higher prospective return and commensurately higher variability of return. But while this is a valid conclusion about how to invest, it is often advanced for the wrong reasons. The conventional reason which is given is that over time the higher returns will swamp the greater risk and all will turn out for the best. If that was correct, it would be tantamount to saying that these assets really are not risky at all. After all, everyone would agree that “All’s well that ends well”, to cite a highly regarded bard from Avon. Risk doesn’t mean profit deferred, it means profit denied. It is not hard to imagine that any analysis which starts by assuming that all kinds of investments are essentially risk-free is liable to wind up taking a lot of risk.

The actual reason why one should invest more aggressively for the long term is simply that the long intervening time leaves one with more time to compensate for periodic disappointments. The graph below shows the results of a simple calculation which bears this point out. Specifically, I asked the following question: If you suffered a sudden loss of \$100,000 on your investments, how much money would you have to pony up each year thereafter to get make you whole after a given number of years (which on the graph is referred to as “maturity”). There are two variables in this question: the term to maturity and the rate of return you expect to earn on the additional savings. That this is the right question is very clear from the case of the saver-by-necessity. For him, there is no question about how much money he will have to come up with when the time comes. But how painful that day is will depend on how much of his liability is already provided for by savings, and conversely, how deep he will have to dig on very short notice to make up the shortfall. Given ten years to save, he only needs to come up with six or seven

thousand dollars per year. Most of the benefit in early years comes simply from spreading the cost over multiple years. At longer maturities, the value of incremental rates of return also becomes very significant. At a ten year maturity, the difference between a 5% and a 15% rate of return amounts to the difference between \$8000 and \$5000 per year; just the additional investment returns will pay 3/8ths of the total cost.

Annual Contribution Needed to Make up a \$100,000 Shortfall.



The most common mistake in designing a portfolio which funds future liabilities is to believe that since the saver will be making some contributions in the future – “Hasn’t the actuary has provided a schedule of projected contributions?” – the pool of existing assets should be invested for the longest possible term. The long term asset is not the existing pool of investments – they are in fact the short term assets – but is the future contributions. This is an important distinction for the following reason. A saver who takes the maximum investment risk with his existing assets will have to use contributions to cushion the inevitable shocks, which means that he is choosing the path which assigns maximal risk to those contributions. He is in effect asking future contributions to subsidize an excessively risky investment policy. If instead he viewed those contributions as the long term asset, he would wisely use the existing assets as his cushion. It is easy to see why savers might get this backwards. When the actuary has delivered the estimates of future contributions, it seems only natural to take them as a given, which means to treat them as immune to risk. In fact, the contributions, far from being certain, are *the most uncertain* part of the puzzle. The art of portfolio management for this kind of need is precisely to minimize the risk associated with future contributions, not to ignore it.

This is not an argument for locking assets away in the cellar. How much risk they should take on is a function of how close they come to meeting all future obligations -- of how fully the liabilities are pre-funded. At one extreme, if the existing assets are only

enough to meet project outlays for next year, invest to a one year maturity, i.e. very cautiously. If the pool is about enough to cover a second year, half of it can be invested to a two year maturity, and so on as the degree of funding expands. If the plan is fully funded, its investment horizon should be equal to the horizon of the liabilities, but this is the maximum. As the actual results roll in each year, including not only investment returns but surprises in the actual rate of outlays, use the contributions to steer the plan toward its strategic funding goal, which may be full funding or some tolerable degree of partial finding. Each year also the management will have to adjust its investment policy for the existing assets, because the extent of funding will have changed. After a good year, in which either investment returns were better than expected or outlays were lower than expected, it is appropriate to ratchet up the level of aggressiveness of the fund because the marginal dollar will probably be around for a long time.

Everything begins with a set of asset allocation/risk bearing schedules which define for each fixed maturity the desired asset allocation for that maturity. This schedule includes assumptions about risks and expected returns by asset class and by investment horizon. On this score, one of the most interesting research findings in finance has been to document mean-reversion over time in returns on financial assets: a finding that worse-than-average decades tend to be followed by better-than-average decades. In the case of stocks on the New York Stock Exchange, this phenomenon has been observed virtually since the beginning of the Exchange. One obvious implication is that stocks and long term bonds are effectively less risky over long horizons than they are over short ones.

Financial Services and Trading.

Every provider of financial services deals repeatedly with questions of the appropriate level of risk for its customers, and we at Logistic Research and Trading Inc. count ourselves in that camp. Risk tolerance should not, however, be treated as a sort of personality disorder. The gist of the foregoing example of portfolio management is that there is more to risk than an amount; there are important questions of *how to take risk*, of what observable factors influence wise risk taking and how the management rules of a saving plan should be cast in light of those factors. The example also illustrates that it is possible to build these rules directly from the client's needs, without having to reach for simple but misleading rules of thumb.

Power Politics

Politics, as everyone knows, is the science of power, touching on every avenue of power by which men and women -- individuals -- exert their influence on the actions and on the lives of institutions and strangers. The term politics usually emits a whiff of suspect motives, although it refers to one of the most essential social institutions. It is the medium through which the talents and vision of individuals are mobilized by individual institutions or by society as a whole. Politics empowers -- to use the latest cant -- individuals who would otherwise be overwhelmed by a forest of impersonal institutions and customs and rules. The essential idea of a republic is that every citizen is invited to be a politician, i.e. to think that he or she can directly influence the institutions and laws which constitute the social environment. That is why democracy and free markets are inseparable: because most of us practice politics in the context of the businesses and markets where we make a living. It is in that setting where we have the most impact on our social environment. Occasionally, though, a remarkable individual comes along who can bring politics to Washington.

For the last three months there has been an awful lot of politics going on in Washington, surrounding the federal budget and the very idea of legislative overview of government programs. The timing of this fracas reflects the confluence of political initiative on the part of the Congress and fundamental, nearly tectonic shifts in the American political scene.

Deficits and Interest Rates.

Since the focal point of the present debate is the fiscal deficit, a short, hard look at the deficit is a good place to start an investigation of Washington politics. How one comes down on this central issue depends on how he would answer the question of whether deficits matter or not. The answer to that question appears to me to be almost shockingly simple: just ask Louis the Sixteenth of France. Debts accumulated over a century of dynastic wars discredited the monarchy. Edmund Burke, shocked beyond belief at the national suicide taking place in Britain's nearest neighbor, showed with hard figures that the existing debt was serviceable. The world had yet to produce its first Keynesian economist, arguing as he would that the debt was good for the country, and in any case the bourgeoisie would probably not have been taken in.

The argument usually advanced for why deficits don't matter actually has the economics turned upside down. The Keynesian views are that, first, borrowing is good because it stimulates demand, and second, that debt is neutral because, "We only owe it to ourselves." That may have seemed a cogent argument in 1935, but subsequent experience has shown up its flaws. As it turns out, borrowing is neutral and deficits are bad. First, borrowing doesn't stimulate demand, it only changes the composition of demand from whatever the tax paying public wanted to buy to whatever the borrowing government wants to buy. There is not always a conflict between these the choices involved. If the public authority is borrowing money to lay out a new city park which everyone in town wants, it is acting as the instrument for private choices rather than as a competitor. But even then, much as they would like to take credit for all the so-called "new jobs" the park creates, there is no reason to expect any net creation of jobs at all, and the net creation of new wealth only equals the difference between the value of the park and the value of the things the public would otherwise have bought with their money.

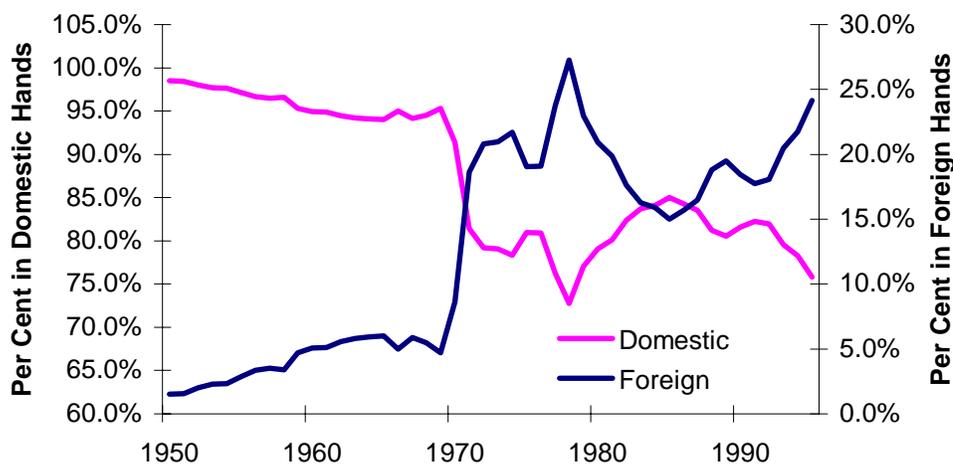
It is the job of free capital markets to ensure that borrowing be neutral. In Keynes' day, British capital markets were in disarray because of the widespread expectation of a Bolshevik revolution. No promised rate of return on private investment was credible in the face of a revolution which would spell the end of private property. As a result, it was impossible for debt and equity markets to clear, and the supply of savings went unrequited. Keynes' stopgap solution was to co-opt the revolution by borrowing the savings and hiring the revolutionaries. We don't have Keynes' problem because we are served by the strongest and most credible capital markets the world has ever known. No matter how great the supply of savings is, there is always a set of market clearing prices – expressed as interest rates and asset prices – which will elicit an equal amount of investor interest. In such a world, borrowing by the Treasury is not unimportant, because it influences exactly how the savings are used, but it does not in itself make for prosperity. The fiscal action most likely to create new jobs in the short run is to tax capital-intensive industries in order to subsidize labor-intensive industries. That practice would certainly be counterproductive in the long run, and hardly anyone is in favor of it.

The other bit of Keynesian doggerel is that the build up of national debt is neutral. It is here that Madame LaFarge and the French bourgeoisie would have disagreed most vehemently. If I owe the debt to myself, I am satisfied that it is neutral; in fact, it doesn't really exist at all. But in reality I am going to be on the paying side and I'm not going to be on the receiving side. Once that is established, I really care very little whether the payee lives in the same town as me, or in the same state, or even in the same solar system. All I know is that I have to work, and yet, to the extent of my share of the debt, I don't get to enjoy the proceeds. If, moreover, I am a business, I don't get to reinvest the proceeds of my work in the business to strengthen its capital base.

Theory aside, however, it is by no means true today that "we" only owe the debt to ourselves, assuming that the "we" are the American people. The distribution of the national debt has changed radically in just the last twenty-five years, highlighted by significant growth in the portion owed to foreign investors. It is useful to think of the

total outstanding debt as having three parts. The first part consists of Treasury bonds which are retained by the Treasury in segregated trust funds, or which have been purchased by the Federal Reserve System. The largest of the funds is of course the Social Security fund. The second part is Treasury obligations owned by all other domestic investors, such as banks, pension funds, and state and local government. The third part is Treasuries owned by foreign investors, including foreign governments. The first component is really not debt, because there is no investor or lender on the other side. The relevant national debt is really the sum of the other two parts, which is usually called the “debt in public hands.” As the following graph shows, in 1950 almost the entire debt was in domestic hands, and that continued to hold until around 1970. Since then, however, foreign purchases of Treasuries have exploded. By the middle of 1995, the latest available data, debt in foreign hands amounted to about one quarter of the total. Note that this graph refers to total holdings of bonds, and not just to how new issues were distributed, so it understates somewhat the importance of foreign purchases of debt in recent years.

Distribution of the National Debt in Public Hands



Source: raw data on holdings of Treasury debt are taken from the Bulletin of the Federal Reserve.

It should come as no surprise that the periods of most rapid growth in the foreign component coincide with periods of weakness of the dollar. The reason is that a large portion of foreign demand is uneconomic demand which comes from foreign central banks, whose purchases are part of a policy of defending the dollar. Crafty domestic investors, by contrast, increase their share of the national debt only when the dollar is rallying and domestic inflation is benign. The trend since 1990 appears on the surface to defy, in part, this characterization: foreign investors have raised their share of the total while inflation has been quite modest. This is also, however, the period of runaway budget deficits – you can’t say Ole Ross didn’t warn you – which evidently exceeded the domestic investment demand for bonds.

Cost - Benefit Analysis.

More to the point, the dollar has been a weak currency in the 1990's despite the relatively modest inflation rate. Against the world as a whole, the dollar fell by about 20% in the period from 1989 to the low point last November. Against the Yen alone, the decline has been even more pronounced. Between the middle of 1989 and the low point last May, the dollar had fallen more than 40% against the Yen. Since then, further buying of Treasuries by foreign central banks has continued to bring our interest rates down and to stabilize the currency cross rates. The cost has been that, for the time being, our Federal Reserve has lost the ability to manage domestic interest rates. This condition need not, however, be harmful. As long as the Fed – with tangible support from both the Congress and the administration – takes steps to defend the dollar and to rein in the creation of new debt, foreign demand is sufficient to keep our interest rates falling, since our rates are higher than those of other countries which have roughly equal inflation rates.

Since the G-7 meeting last May the Fed has done its part, as evidenced by the amazingly high Fed Funds rates of the last seven months. And since foreign central banks have, collectively, far more money to spend than does the Fed, this is a cost-effective monetary policy. A comparatively small amount of defense of the dollar has translated into huge foreign purchases of Treasuries and lower rates all along the curve.

This brings us to the wild card in this deck of policy cards: the federal deficit which makes it necessary to find ever deeper foreign pockets.

The Newton Rules.

The student of economic history will no doubt find this chronicle of the economics of national debt extremely important and even interesting. And it is important, even if the recounting is a bit turgid. But it really is also quite insignificant. What is significant is how men and women apply, or fail to apply, their ingenuity and wisdom and their courage and guile to steer the ship of state through the hazards of public finance. Because this is politics, it is a group process, and the decisions are collective. But as always it is individuals who make the difference.

The year 1996 appears destined to be the Year of the Federal Budget, leading to a thorough revamping of the way the budget is formulated and spent. Since the New Deal, the administration has always been the initiator where the budget is concerned, and the Congress has perennially had to play catch up. This has resulted in a dangerous absence of politics in Washington: the administration could budget in more-or-less a vacuum and the members of Congress could vie for plums, but both individually and as an institution they did not have much impact on either the size of the budget or its priorities. This bald characterization is undoubtedly overly simplistic, and even unfair to some effective legislators of the last sixty years, but the palpable air of crisis which attends the present budget negotiations makes very clear that at least in degree, if not in kind, this is an

entirely new ball game. Credit for opening up the budget process goes entirely to Mr. Gingrich and the new House leadership, who went out on a slender limb to bring it about.

All of us ordinary citizens are merely spectators at this stage of the process. Some will be delighted with the outcome, whatever it is, and some will be devastated. We can share a sense of satisfaction, however, in the knowledge that this is just politics, which is the proper business of a republic.

Lord Keynes Goes West

Is deficit finance an idea whose time has gone or is it an idea whose time has come? Even in this day of the Contract With America, when debt has lost respectability in Washington, it retains a powerful allure in other major capitals. The situation in Tokyo is a fascinating case in point. The Japanese government has not stinted at the traditional kind of fiscal pump priming in an apparent effort to stimulate business at home. The internationalization of economics, however, requires one to see even this most conventional policy in a new light.

In 1932 Lord Keynes undertook a whirlwind tour of universities in North America to promote his new book on monetarism and the spreading Depression. Lord Keynes' travels took him as far west as Chicago, where his audience included some highly promising young graduate students, Milton Friedman and George Stigler among them, who were destined to lead the science of economics in directions very different from the direction that Keynes was headed. From Chicago he returned to Cambridge, but his theories continued to migrate westward, crossing the continent and the Pacific Ocean.

The book in question – a precursor of the famous General Theory – tried to make the case that falling interest rates would fail to elicit business investment if business leaders began to believe that the level of interest rates was destined to fall even further. His insight into the importance of expectations is one of the greatest contributions to economic theory in this century, but there is no evidence that this interesting theory was ever the solution to any actual problem. Certainly no one ever took seriously the proposition that the Depression was caused by interest rates that were just too *low* to appeal to potential borrowers. Whether plausible or not, the purely theoretical aspects of his thesis were not nearly as important, nor as controversial, as the conclusion he drew, which was that if households and businesses would not take on more debt, the government should do it for them. Needless to say, there is hardly a world capital where this advice has not at some time been greeted with the same gusto that, in a simpler age, King Henry the Eighth reserved for a good leg of mutton.

The Economic Challenge ...

Many persons in this country are more or less aware that Japan has been in a recession for several years and that their government has engaged in conventional pump priming. But I doubt that many suspect the extent to which the Japanese government has

carried this policy, or appreciate the depth of the depression which struck Japan in this decade.

One revealing indication of how big the problem has been lies in the government statistics on industrial production. This is a convenient barometer, because it should be reasonably comparable with the industrial production index which our Fed produces for the U.S. economy. Between 1990 and 1993, the index of industrial production in Japan fell by 9%. These were of course years of rapid expansion in America, so there is no point in comparing this history to our index of industrial production for the same years. Looking over all of recent history, there have only been a few episodes in which our index of industrial production has been down for a stretch of three years – i.e. where its level was below the level of three years previous. The worst of these was from 1979 to 1982, when our index was also down about 9%. No other American recession in the post-war period was remotely as serious. Continuing the comparison for a fourth year – for Japan, the year 1994, and for us, 1983 – the Japanese recession actually appears to be more severe than ours. By the end of 1983, four years after the start of the recession, American industrial production showed positive growth over 1979 – output grew more in 1983 than it had declined in the preceding recession – while even over the four year period Japanese output was still down about 8%.

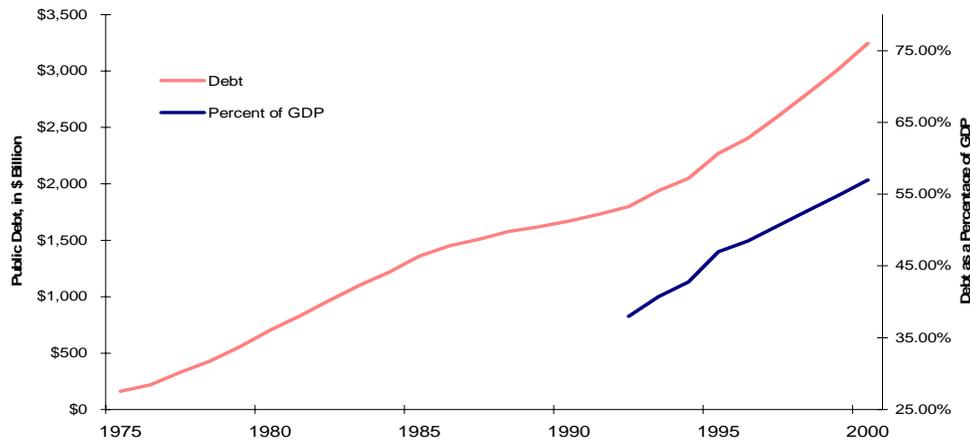
The causes of these recessions were moreover remarkably similar. Our recession marked the final curtain on an economy which had been based since the Roaring 20's on heavy industry and housing. These were the sectors – principally housing and automobiles – which New Deal planners had targeted, and which responded by delivering forty years of growth in employment and incomes. By the end of the '70's, however, autos and steel had become quasi-socialist monoliths incapable of competing internationally and incapable of profiting from, or even of coping with, wholesale change in their business environment. Housing was merely hamstrung by high interest rates. Our economic policies desperately needed reform and liberalization, and got them in heaping doses from Ronald Reagan and Paul Volker. By all reports, policymakers in Japan face many of the same choices. It is a telltale sign of how distorted the Japanese economy had become that while Japan was flooding the developed world with low cost exports of favored industries – steel and autos, again, and electronics – their manufacturers were forced to relocate in other countries to control costs. Japan was confronted with the remarkable paradox of an industrial base which was so apparently successful that it could no longer afford the real estate under its own factories!

... Yields Deficit Finance.

Over the last fifteen years, America has taken second place to no nation in the use of deficit finance, but we have been far from alone. The fiscal record of Japan in this decade is in some respects more striking than our own. A simple graph depicting the deficit in the Japanese budget and the growth of debt appears on the next page. The punch line is that in a few years' time, public debt of the Japanese treasury will rival our own, and will be larger on a per capita basis. In drawing this graph, I have converted all

Yen figures into dollars using a constant exchange rate of Y100 to the dollar, which is roughly equal to the actual rate today. Some such assumption must be made because we have no actual rate with which to convert the debt estimates out to the year 2000. The effect of using a constant exchange rate is that the graph looks just like it would in Tokyo, except that the y-axis is labeled “Dollars”. Converting Yen to dollars each year would make the graph even steeper, because the Yen has grown in dollar value.

Public Debt of Japan



Source: Japanese Ministry of Finance, as reported by the Nikkei Weekly and the 1995 Data Sourcebook. Debt totals and GDP through 1994 are actual, 1995 and following are Ministry forecasts.

A Japanese national debt of \$3.5 trillion compares favorably with our federal public debt, which stands today at around \$3.6 trillion. If, moreover, the Yen continued to appreciate relative to the dollar as it has done in the past, the actual dollar value of their debt would be correspondingly larger. In light of the magnitude of the debt, however, it seems highly unlikely that the Yen will appreciate, and it seems far more likely that it will depreciate over time.

The International Connection.

Lord Keynes paid remarkably little attention in the General Theory to the international spillover of economic policy. He was certainly not insensitive to issues of interdependence. Years earlier he had denounced the Treaty of Versailles for its shortsighted and self-defeating measures to handicap the German economy, pointing out that all of Western Europe would pay the price for impoverishing its economic engine. As the example of the Treaty of Versailles illustrates, policies often look very different from an international perspective than they do from a narrowly domestic one.

Whatever are the domestic consequences within Japan, the international effect of the growing Japanese national debt is to make it easier for foreigners to hold assets in Yen. There are other ways to own Yen, of which the most obvious is Euro-Yen deposits at major banks. But many purposes require the sort of credit guarantee which only the Japanese treasury can provide. One of the most significant examples is that of financial institutions which do business in Japan, and need to hold Yen-denominated reserves

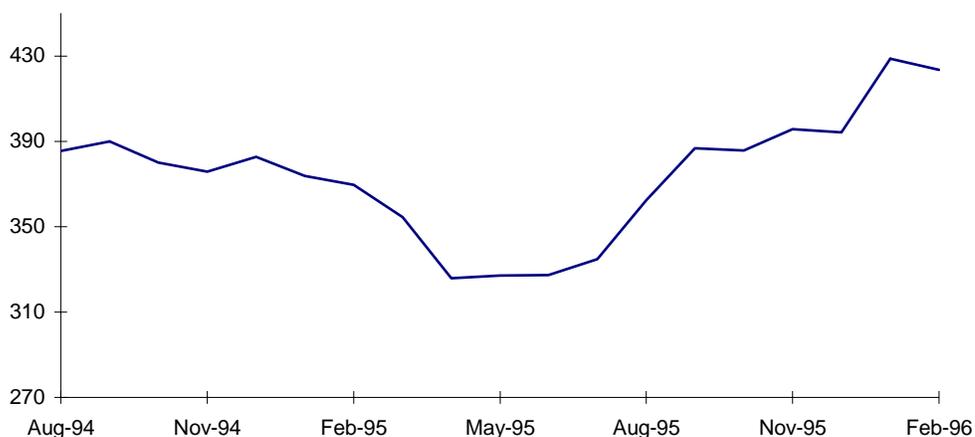
against Yen-denominated liabilities. Just as American Treasury bonds are simply interest-paying dollars, so Japanese Treasuries are simply interest-paying Yen. Historically, the Japanese government preferred to transact international business in dollars, but the growing importance of Japan in world trade and the extreme instability in the dollar-Yen exchange rate have conspired to make that policy untenable. Other nations -- especially other Asian nations -- now have large Yen liabilities which they need to be able to hedge directly, because dollar-denominated reserves leave them with too much exchange risk on the balance sheet.

The explosion of Japanese Treasury borrowing has thus come at a propitious time, and represents a natural stage in the evolution of Japan into a major world economic power. The most immediate beneficiary -- besides the Japanese government, which is able to borrow at attractive interest rates -- are Asian governments and financial institutions, which naturally want to earn interest on their Yen assets. It tends, however, to add to an existing competition between the dollar and Yen, depending on where these liabilities lie. Those which have primarily dollar liabilities would want the dollar to cheapen up relative to the Yen, while those which have a preponderance of Yen liabilities are rooting for a strong dollar and a weak Yen. Thus the Japanese government can make Japan a more attractive trading partner and creditor in Asia by depreciating its currency relative to the dollar, or at least by preventing appreciation.

The Yen price of gold.

Until about one year ago, the Japanese government pursued a strong Yen policy. But it became apparent that a strong Yen was crippling their trading partners in Asia. The most powerful evidence that the Japanese government now wants to stop the appreciation of the Yen can be found in the price of gold in Yen, which is depicted in the graph below. After bottoming last April, gold has steadily gained in value against

Price of Gold in Yen



Scale: Y100 per ounce of gold Source: Gold -- Handy and Harman -- Yen -- Wall Street Journal closing spot exchange rate.

the Yen, making it easier for other Asian nations to raise the Yen they need to service their debts. The United States also has run large trade deficits with Japan. We have not become a Yen debtor nation because they have chosen to hold those credits in dollars rather than Yen.

In any case, the new, weak Yen policy is designed not with us in mind, but with an eye toward their role in the Asian economy and to the needs of their own economy. It expands the usage of Yen as a reserve currency, which seems at first blush to be a paradoxical result of running up a large fiscal deficit and depreciating the currency. Further reflection, however, reveals that this was precisely how America promoted the role of the dollar over the last thirty-five years, so evidently the paradox is more imagined than real.

Why I Would Tax Capital Gains

Any reduction in tax rates is enormously appealing to an over-taxed public, and for this reason it is hard to object to lowering the rate on capital gains. But to equate a reduction in the capital gains rate with a tax cut is faulty logic, and leads only to greater distortions of the tax code, rather than to lower taxes.

Why Don't Americans Save More?

Our federal tax code has long provided for lower rates on income from capital gains than from other sources of income, including other kinds of income from investments. At the present time the top rate on long term gains is about ten percentage points lower than the top rate on other income. Proponents of lowering the rate on gains further -- of widening the gap between the rates on gains and other income -- believe that doing so would encourage investment and saving, and believe that in the long run the fruits of that investment would make for a bigger pie for everyone. That is an admirable goal, but it is an inappropriate and ineffectual means. The better remedy is even easier to explain and to justify: It is to lower all tax rates and, as much as possible, to make them more, not less, equal.

The connection between the tax on capital gains and saving is actually pretty tenuous, for a couple of reasons. It does no good to cite the example of Germany, which does not tax capital gains, because the German public actually has few opportunities to incur capital gains, and in any case their saving rate, like the rates in all European countries, is actually very low. A quick glance at the list of publicly traded equities on the German stock markets reveals how few shares are available to the public, in relation to the size of the German economy, and the same is true of all other countries on the Continent. The reason is not that Europeans are unfamiliar with the idea of public capital markets -- the Paris Bourse has been in existence since the Middle Ages -- but that they have never assumed a very important role in those economies.

Only in America and Japan, and Britain to a smaller extent, do we find a large capitalistic middle class who participate actively in corporate ownership through ownership of traded stock. Elsewhere, private capital winds up either as equity in closely held family businesses or as deposits in banks and other financial institutions. The question of what to do with profits from equity investment, therefore, is almost uniquely

an American problem. I need hardly add that, speaking as an American, it is very nice problem to have.

If Americans don't save as much as you would like them to, the chief culprit is that we don't count the largest part of private investment. The largest share of investment capital consists of the training and education of the working public, but in figuring up the national saving rate we simply omit this investment, and treat it as spending on final consumption. Its importance, however, can easily be appreciated by comparing the incomes of highly skilled workers with those of unskilled workers, keeping in mind that the difference represents the return on investment in training and education. In recent years, as unskilled workers have become virtually unemployable, this return on investment in the person has grown to account for nearly all of labor income. As far as tax treatment is concerned, the tax on capital gains is no more likely to stifle investment in business fixed capital than the Social Security tax is to discourage persons from going to college or sticking with an arduous apprentice program. Actually, profits taxes *do* discourage investment, and payroll taxes *do* discourage investment in personal productivity, and that is why it is imperative to keep all these tax rates as low as possible. Far from being laggards in the cavalcade of national savings, Americans are among the stars of the show, and a better tax code can make them even better.

The Burden of the Capital Gains Tax.

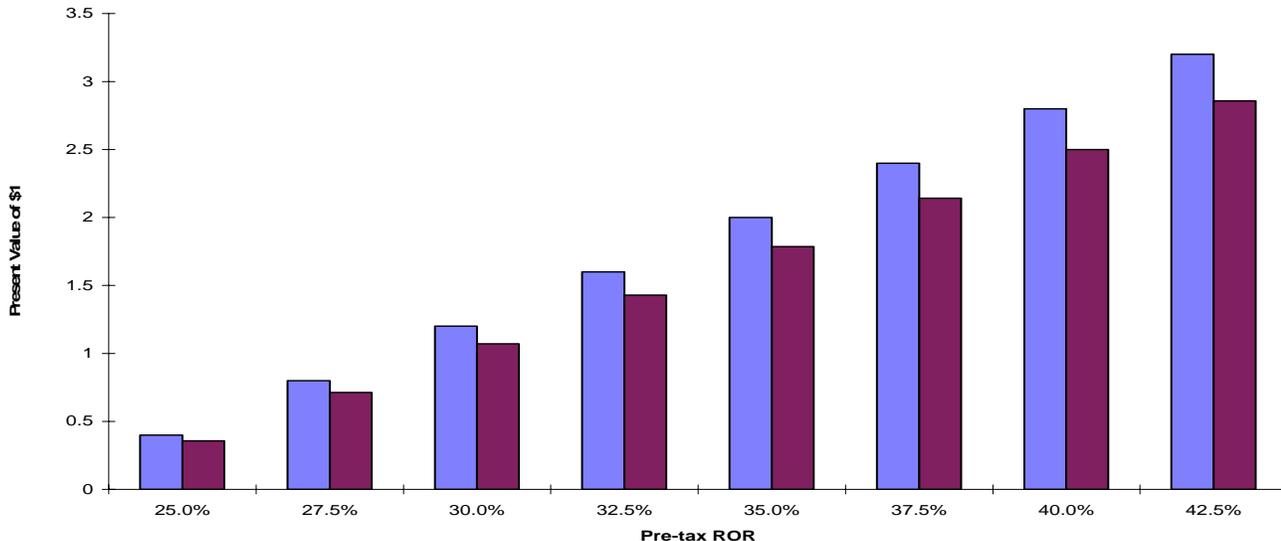
I advocate treating all capital gains as ordinary income, without any differentiation at all. This position is by no means original to me; Milton Friedman made this case cogently in the 1950's in a lengthy article on taxes and public policy. At a practical level, the most compelling reason for equal treatment is that otherwise the distinct gains tax becomes -- to paraphrase Saddam Hussein -- the Mother of Tax Shelters (this is positively the only time I will ever cite Saddam as a luminary on any subject). It is the motive force behind an endless succession of schemes to turn ordinary income into "gains", and in the end only supports an army of tax experts adept at this game. Some schemes are harmless but others distort investment decisions and business decisions in ways that cost everyone money.

A tax on capital gains does not discourage saving to any greater extent than the income tax discourages working; i.e. it does so to some extent, but as long as the rate is not too high, the effect is negligible. This is not to say, though, that it is without economic effects. Its effect is primarily on the *relative* attractiveness of different investments, and not on the overall desirability of investing. Simply put, taxing capital gains at *any* rate -- even a rate lower than ordinary income -- penalizes investment in "gains-rich" ventures in favor of investment in "income-rich" ventures. Restated, in English this time, it penalizes investment in high growth business and rewards investment in stable businesses.

This month's Logistic Centerfold refers to the results of a simple simulation designed to make this more concrete. The graph shows the present value of an invested

dollar in terms of two significant variables: the gross -- pre-tax -- rate of return on investment and the rate of taxation of capital gains. For any given rate of return there are two columns -- a taller one which equals the value of an invested dollar if gains are not taxed at all, and a shorter one which shows the value after dunning the investor for capital gains. The tax rate I used is 6%, which may seem low, but is actually comparable to a conventional rate of 28.5%. The reason is that in this simulation I tax all gains every year, but in reality investors hold on to gains for many years before realizing them and paying the tax. A rate of 28.5% on realized gains works out to a rate of around 6% per year on *all* gains if on average investors hold gains for four years. The rates of return used in this simulation may appear high to most investors -- we just don't see enough 40% profits in the normal course of affairs -- but keep in mind that they are not only pre-tax, but also before allowance for depreciation. Netting out depreciation and income taxes reduces a 40% rate of return on this basis to something like 20%.

**Present Value of an Invested Dollar
for Two Cap Gains Rates**



Assumptions: 20% income tax rate, 10% depreciation rate, 20% reinvestment rate, and 15% required rate of return

The differential effect of the capital gains tax implies that the gap between the present value of an invested dollar should be larger when the rate of return is larger, and that is precisely what the graph shows. At the lowest ROR shown -- 25% -- applying the capital gains tax lowers the present value of one invested dollar by about 4 cents, from \$0.40 to \$0.36. At the highest ROR on the graph -- 42.5% -- the present value of an invested dollar falls by 34 cents, from \$3.20 to \$2.86. While this simulation is highly simplistic in many ways, it is realistic enough to make the case that the capital gains tax is directed at the most profitable firms, whose profits are growing the fastest. Why then would anyone want to tax capital gains?

Why Isn't This Conclusive?

Because It fails on purely economic grounds, and even more importantly, it fails the test of what is a just tax code.

As far as the economics are concerned, the proponents of the flat tax have it right. The basis of an economic rationale for taxing capital gains proceeds from the premise that we want the tax code to *maximize* the tax revenues that a given tax rate raises, and therefore to *minimize* the tax rate. This syllogism may be jarring to readers who suspect that every unit of government would like to maximize *both* the rate *and* the total levy, but even skeptics should agree that there is no practical way to minimize the tax rate without maximizing the revenues that a given rate produces.

A lower rate for capital gains fails to minimize the tax rate because it is a tax-shifting levy; it shifts the tax burden away from gains on investments and toward wage and salary income. The authorities have little choice but to accommodate by raising the tax rate on wages. The result is a Pyrrhic victory for capitalists, and the reason is that the marginal tax rate which distorts economic decisions is not the average rate. It is, rather, the highest rate levied *anywhere* in the tax code, against any broad category of income or wealth. Promoting tax shifting is also bad politics, because it makes different categories of tax payers, who should be allies, into rivals who are easily bought off or conquered individually.

Ability to Pay.

As important as the economics are, the ethical ramifications are far more serious, because what is at issue is the premise that tax levies should be based on the subject's ability to pay. It is this standard on which any measure of fairness or justice are predicated, and without which the tax code is a chaos made for the most cynical and exploitative.

The bedrock of the test of ability to pay is that every dollar of income should be taxed equally with every other dollar of income. It is appropriate to exempt from this an amount which meets the basic standards of a decent living because no one should be driven into poverty by the taxes on the income he earns for his support. Discriminating between different sources of income obscures the fundamental message that taxes are levied on *income per se*, "because" is it income. And realized capital gains are unquestionably income for these purposes, because they are net cash flow which the person has available for meeting all the expenses of life. The person who lives on \$100 thousand of capital gains is exactly as able to pay – and no doubt feels just as mistreated – as the person who lives on \$100 thousand of salary; there is no difference whatever. The injustice, if there is one, comes to both of them as a consequence of the tax rate.

A tax code which leaves them both with, say, \$85 thousand is tolerable I suppose. One which leaves them both with \$60 thousand is not. The only thing worse would be a tax code which left one with the 85 and other with 60. The reason it would be worse is not only that I have a sinking feeling about which camp I would be assigned to, but more importantly, if one person pays taxes at a 15% rate and another pays 40%, then the government is not even making any pretense of justifying or rationalizing any of these rates. It is admittedly just taking whatever it can get.

Aside.

I never claimed to be much of a cook, but I'm still a little ashamed to confess that rubber is the only food I have ever cooked successfully in a microwave oven. And in many cases I didn't even know that that is what it was supposed to be.

E Pluribus Unum

This is the motto of the United States, and its proud proclamation to its own citizens and to the rest of the world. I find myself tempted to ask how many thirteen year olds could interpret it, or muster even a literal translation, today. But much more importantly, how many of their parents want it to be true today?

Nation and Community.

The motto “One Nation of Many Diverse Parts” resonates even today because it is a declaration of the intent to form a community of free and equal persons. Most people think it remarkable that the population of this country was drawn from different lands and different cultures. That, however, is closer to being the common experience of nations than an exception. The United States is far from being the only country populated by people who are conscious of their immigrant roots. Canada and Australia are highly similar in this regard, as are Brazil, Argentina, Chile, and the Union of South Africa. In each of them, what small native population remains is marginalized and culturally insignificant.

Most of the nations of the world contain within them diverse population, identified by language or religion or occupation or physical appearance as different from their neighbors. While a few old countries are apparently rather homogeneous, some of them are among the most divergent populations in the world. Iraq, for instance, which housed one of the cradles of civilization in remote antiquity comprises Shia Moslem farmers in Mesopotamia, Sunni Moslem mountaineers (the Kurds), Christian shepherds (the Assyrians) who continue to identify with the feared Assyrians of the Bible, Christian Bedouins of the desert (the Chaldeans) who continue to identify with the almost equally feared Chaldeans of the Bible, and a few Bedouin Moslems, including Saddam Hussein and his few surviving relations. It is a tribute of sorts to the consistency of human nature that none of these groups gets along very well with any of the others. The rift between Assyrians and Chaldeans, for example, arises from the broader social rift between Bedouins – the nomadic people of the desert – and settled, agrarian peoples of the Arab world. Only Saudi Arabia is spared that particular cause of social division, because it is almost completely desert, which seems like a high price to pay for a small bit of social harmony.

The real significance of our national motto is not that we are diverse, but that from the very start we have been proud of it, and committed to knitting all these parts into a single national community.

Diversity Chic or Brotherly Love.

The premise on which this country embraced diversity and multiculturalism was a determination to look past superficial differences between persons and to address their common humanity, recognizing that all persons enjoy not only *equal* rights, but the *same* rights by virtue of their human nature. There is no place for “separate but equal” in diversity, because separate but equal is just apartheid with a human face. It isn’t justice in Iraq, and it can’t be justice in America either.

Never has more zealous lip service been paid to diversity than is paid today, but the diversity chic rings hollow because it is built not on an affirmation but on a denial of common human rights. The problem is not that we have factions and divisions, although the Founding Fathers would have been horrified by them. Factions arise from the simple fact that to be heard and to be effective, people have to work within the context of smaller, more cohesive groups, which are already somewhat sympathetic to what the person is trying to do. That is sort of what a business is, and it is definitely true of a political party, a fraternal organization, or a self-conscious ethnic group. Groups are more powerful than individuals are – that indeed is the whole reason why they exist – and when they clash sparks fly.

People attach themselves to groups and organizations because of the universal need that they have to express their individuality and to achieve their goals within smaller, well-defined groups. This is fundamentally a creative process because individuals can only use their particular talents effectively in the context of focused groups and delimited communities. The conflicts that this causes, though, are always present and come in an infinite variety of forms. One instance is the increasing amount of vituperation being expended over the issue of a national language. Language is always a contentious issue that represents many of the hardest issues and has been responsible for a lot of conflict. On one hand, a language achieves its usefulness to the degree that a broad community shares the same one, and as a result everyone wants his language to be adopted by all persons. But at the same time, language demands specialization and focus. There can only be one, or at most a few, way to say “Watch Out!” and only one way to spell the word “procrastination.” (Although there are of course countless different ways to practice it.) If there were dozens of different ways to warn someone of danger, they would all lose their impact because they would need to be interpreted first. The reason why we don’t all speak the same language is simply that the world is too large and diverse to agree on all the fine points that the common language would require. We would not gain the ability to communicate with distant people, we would in the end lose the ability to communicate with anyone. As far as language is concerned, it seems to me we should spend less time agonizing over why Quebecois and Australians speak incomprehensible tongues and devote more energy to exploring the richness and beauty of the language we happen to use.

Rivalries between distinct classes and nationalities and between foreign languages are an inevitable part of life, things that we have to deal with more or less successfully every day.