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The Death of the Risk Premium: Consequences of the 1990s.

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The Death of the Risk Premium

Consequences of the 1990s.

Robert D. Arnott and Ronald J. Ryan

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A pension fund's objective is 1) to pay or fund the pension liability, 2) at the lowest cost to the plan sponsor, 3) subject to sensible risk. This means that, ideally, returns on the pension assets should be the primary source to fund these liabilities, rather than a pension contribution coming from the employer, the employees, or, in the case of public funds, current or future taxpayers. For university endowments, the same logic applies, typically over an even longer span than most pension portfolios.

One of the most striking developments of the 1990s is the evaporation of the forward-looking risk premium for stocks measured relative to bonds. This development is new enough that it is not yet widely accepted as fact. Whether it is fact or mere hypothesis, it is useful to consider the implications of a negative risk premium for stocks, which are far-reaching and sobering. They affect funding policy, investment return expectations, corporate earnings, and asset allocation planning, not to mention lesser aspects of institutional asset management.

WHAT IF EQUITIES DON'T BEAT BONDS LONG-TERM?

If long-term sustainable future returns for a balanced portfolio are only around 6%, how well funded is your pension fund? What are the policy allocation implications if equities don't beat bonds over the next 10 or 20 years? These are questions we need to ask in the wake of today's record valuation levels and relatively high real yields for government bonds. Yet they are not being explored in any meaningful way.

This may seem an alarmist perspective, since stocks have always been priced to offer a material risk premium to bonds. During the lifetime of each and every one of us, this has been self-evident. And investors have enjoyed this risk premium; stocks have outpaced bonds by about 5% per year for a 74-year span, and have produced real returns north of 7% for an entire century.

Indeed, a good case can be made for the notion that the party is not over. Dividends have been replaced with stock buy-backs, mergers and acquisition activity, and ordinary reinvestment to fund future growth. Furthermore, as even a casual market observer could easily see, the technology revolution is real, delivering faster economic growth and more wealth creation than we have ever seen so late in an economic expansion. The key question here is how much of this good news is already reflected in market prices.

Is the party over? It would be foolish to say that markets can go no higher. Of course they can go higher—but there is a trade-off. The higher the markets go, without underlying fundamentals keeping pace, the lower the *future* rates of return must fall. This is a simple truism that has some rather alarming implications. Few would reject the notion that future real returns on stocks cannot, from current market levels, match the past. Interestingly, we *can* put a number on it.

One path to estimating future returns is to examine the past. Over the past 74 years, stocks have produced a real return of 8.4% a year. Now, let's dissect this 8.4% real return to see what it tells us about future equity potential.

Real Returns

We know that 2 percentage points of the 8.4% real return have come as a direct consequence of dividend yields at their lowest levels in U.S. history and P/E multiples now at their highest levels in modern U.S. history. Only the Great Depression saw higher P/E multiples, but these were based on severely depressed earnings, where today's multiples are based on near-peak profit margins.

In 1925, investors paid 18 years' worth of current dividends to buy stocks; today's investors willingly pay 80 years' worth of current dividends to buy stocks, more than quadruple the 1925 levels. Investors are now willing to pay three times the Price/Earnings ratio that they paid in 1925.

This trend would be dangerous to extrapolate: Will dividend yields fall fourfold to 0.3% in the next 75 years, as P/E ratios triple again to north of 100? While this is not impossible, nor is a return to historical norms (or worse), which would lead to truly dreadful real returns in the years ahead. Accordingly, the 2 percentage points of the historical real return that are attributable to market revaluation cannot be extrapolated into the future. Absent this revaluation of the price investors will pay for a dollar of dividends, real returns would have been 2 percentage points lower, or 6.4%.

The advocates of regression to the mean would argue that this part of the real return, which has contributed 2 percentage points of the 8.4% earned in the past 74 years, is far more likely to be negative in the years ahead than positive. The new paradigm crowd would argue that valuation levels can and should go far higher still. The naive efficient markets view would suggest that current pricing is fair, and therefore that the best estimate for this part of the real return is zero. As we will see, even the efficient markets view, that current valuation levels are fair and sustainable, probably leads to a negative risk premium in the years ahead.

Dividend Yields

Today's stock market dividend yield of around 1.2% is 4.2 percentage points below the dividend yield of 1925. To be sure, part of the reason for today's low yields is that dividends have been supplanted, in part, by stock buy-backs, reinvestment to improve future growth, and merger and acquisition activity. But, it is just as appropriate to view these reinvestments on behalf of the shareholder as sources of faster real dividend growth, rather than as "hidden dividends" per se. Accordingly, this drop in dividend yields represents a 4.2 percentage point reduction in prospective real equity returns, partly offset by faster growth.

Suppose we take the 8.4% real return of the past 74 years, and subtract both the 2 percentage points that is attributable to rising valuation levels and the 4.2 percentage point drop in forward-looking dividend yields on the S&P 500. This brings us down to an expected real return for equities of 2.2%, a shockingly bad real return.

Real Dividend Growth

Real dividend or earnings growth cannot exceed real economic growth in the very long run, or eventually earnings and dividends grow larger than the economy itself. Furthermore, since a material part of economic growth is derived from new enterprises that are

EXHIBIT 1
HOW LONG IS LONG-TERM?
REVISITING THE IBBOTSON DATA

	74 Years Since Dec. 1925	Outlook Starting Jan. 2000
Starting Dividend Yield	5.4%	1.2%
Growth in Real Dividends	1.0%	2.0% (approx.)
Change in Valuation Levels[a]	2.0%	Unknown
Cumulative Real Return	8.4%	3.2% (approx.)
Less Starting Bond Real Yield	3.7%[b]	4.1%[c]
Less Bond Valuation Change[d]	–0.4%	Unknown
Cumulative Risk Premium	5.1%	-0.9% (approx.)

[a]Yields went from 5.4% to 1.2%, representing a 2.1% annual increase in the Price/Dividend Valuation Level.

[b]A 3.7% yield, less an assumed 1926 inflation expectation of zero.

[c]The yield on U.S. government inflation-indexed bonds.

[d]Bond yields went from 3.7% to 6.5%, representing a 0.4% annualized drop in long bond prices.

not yet investible (indeed, many of which do not yet exist), real growth in dividends and earnings is effectively capped *well below* the real growth of the economy. This is the primary reason that real dividend growth has been 1% per year over the past 74 years, in an economy that has grown at 2.5% per year.

Accordingly, while it is very easy to make a case for future real dividend growth that is faster than past growth, it remains very difficult to make a case for sustainable future real dividend growth that is faster than the growth of the economy at large. Are stock buy-backs likely to boost real dividend growth? Of course. Is the higher level of earnings reinvestment likely to boost real dividend growth? Of course. Is the "tech revolution" likely to increase productivity and thus faster economic growth, and can that contribute to faster real dividends and earnings growth? Of course.

But, unless one wishes to postulate real economic growth above 5%, with less than 40% of that growth coming from new enterprises, it is difficult to justify long-term real dividend growth above 3%.

If we assume faster economic growth, and assume that more of this growth reaches today's shareholders than in the past, we can justify real dividends and earnings growth of two or three times the 1% growth that history has delivered. The result is 2% to 3% real dividend growth. In order to forecast a faster real growth rate for earnings or dividends on a long-term sustainable basis, we need to make assumptions that must be viewed as very aggressive, even heroic.

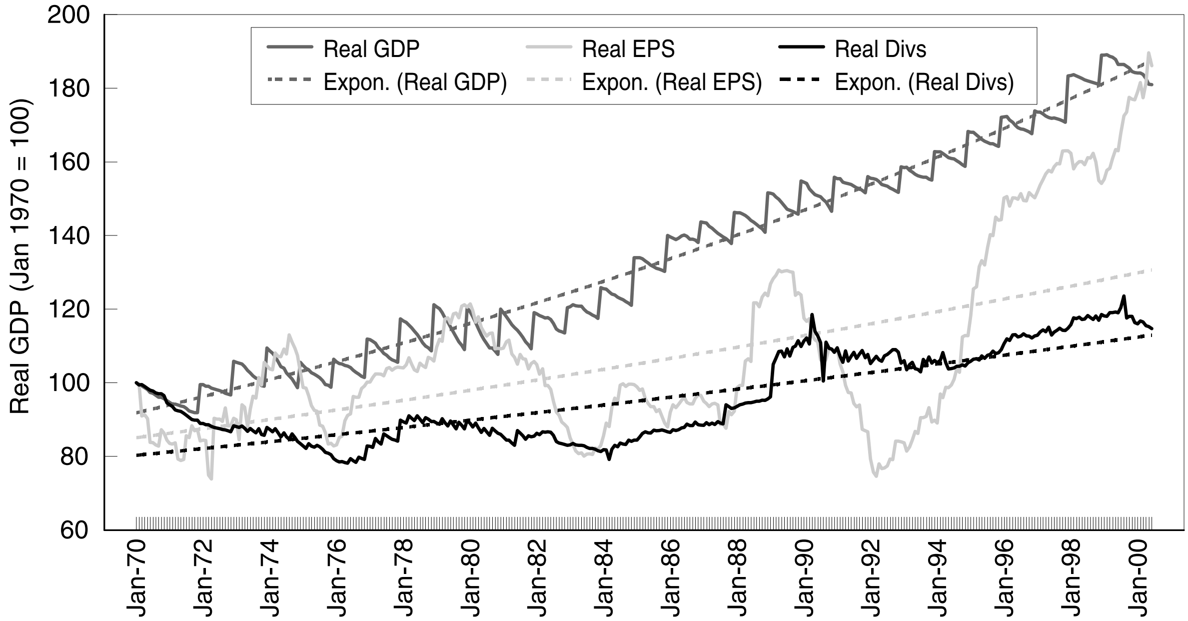
WHAT REAL RETURNS *SHOULD* WE EXPECT?

Summing these, as we do in Exhibit 1, brings the real return up to the 3.2% range, *assuming that current valuation levels hold*. Particularly aggressive growth assumptions (3% growth in real dividends) could stretch real equity returns to perhaps 4.2%, which barely exceeds the government-guaranteed yield on inflation-indexed bonds. An important caveat is that one might just as easily make a case for real dividend growth that is *lower* than the 1% historical growth rate. Either way, this is a far cry from the historical real return of 8%.

More important still, our 3.2% outlook for real returns falls short of the real return available in inflation-indexed government-guaranteed bonds. For the first time in U.S. capital markets history, the equity risk premium is probably negative, barring some very aggressive assumptions regarding economic growth and the share of that growth that makes its way to the investor in today's enterprises.

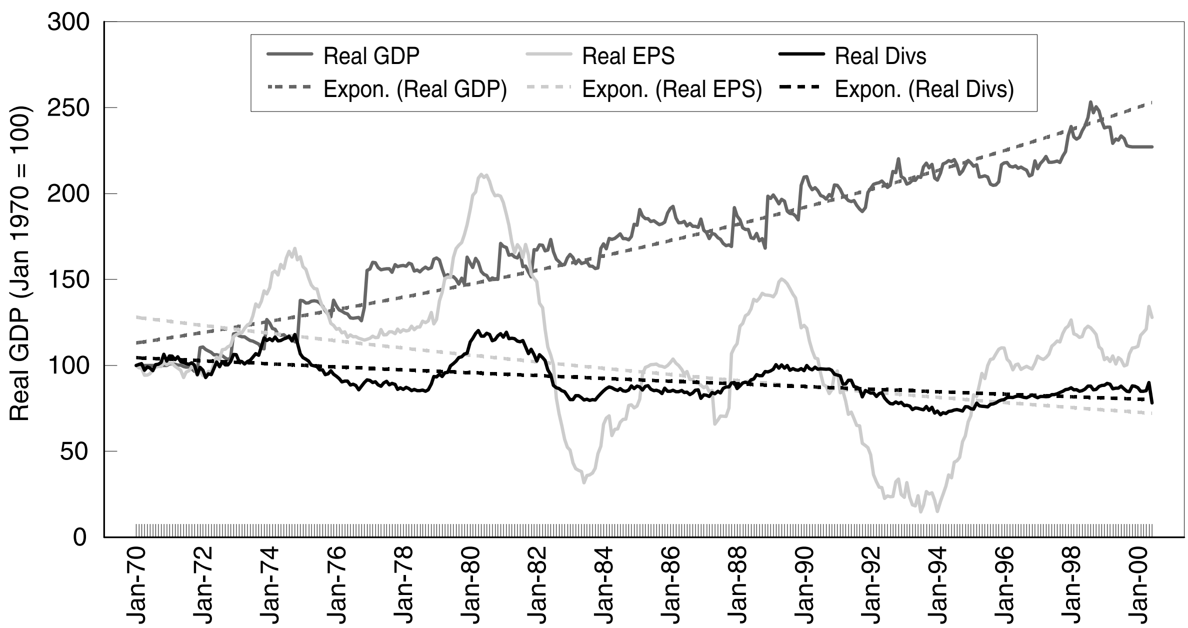
This result contrasts sharply with the consensus. In a very important draft paper by Ivo Welch, the consensus of 226 academic financial economists was that stocks should outpace Treasury bills by 7% per year over the next 10 and 30 years. If we credit Treasury bills with the historical average real return of 1%, this implies an 8% real return assumption for stocks. The lowest estimated risk premium of the 226 in the survey was a 2% risk premium. There is clearly a huge gap between this consensus, which was probably conditioned by extrapolating the past, and the plausible real return or risk premium in the future. When bond yields fall from 9% to 6%, investors will expect a lower return from bonds. But, as stock dividend yields fall from 4% to 1% (or earnings yields, the reciprocal of the

EXHIBIT 2A
U.S.



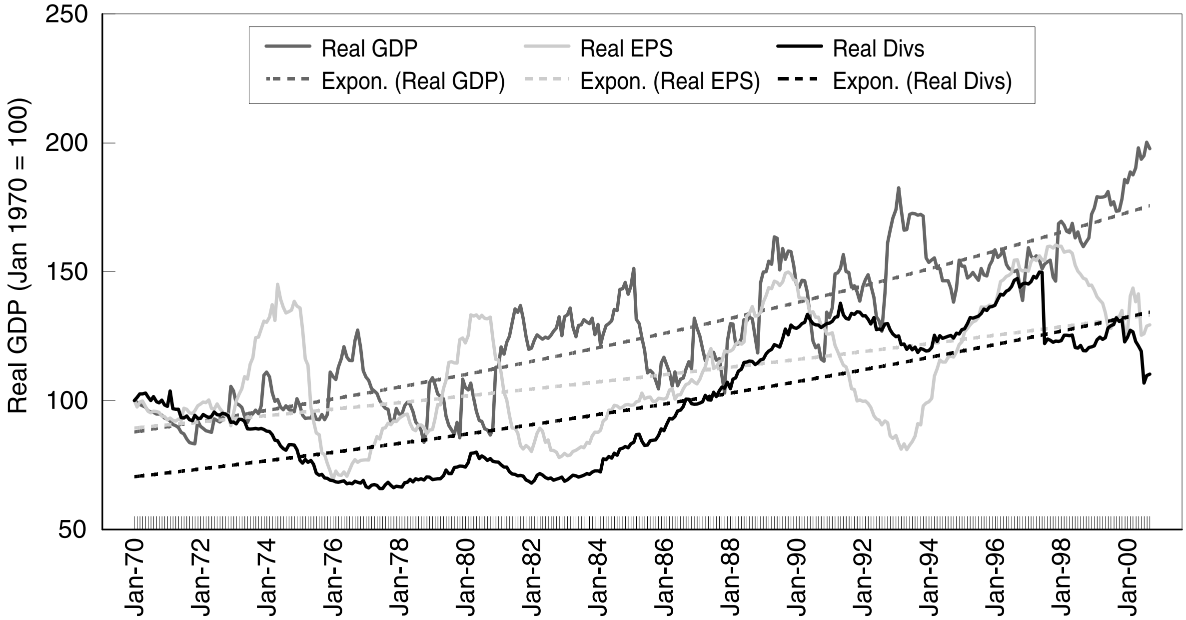
Source: Organization for Economic Cooperation and Development (OECD)

EXHIBIT 2B
CANADA



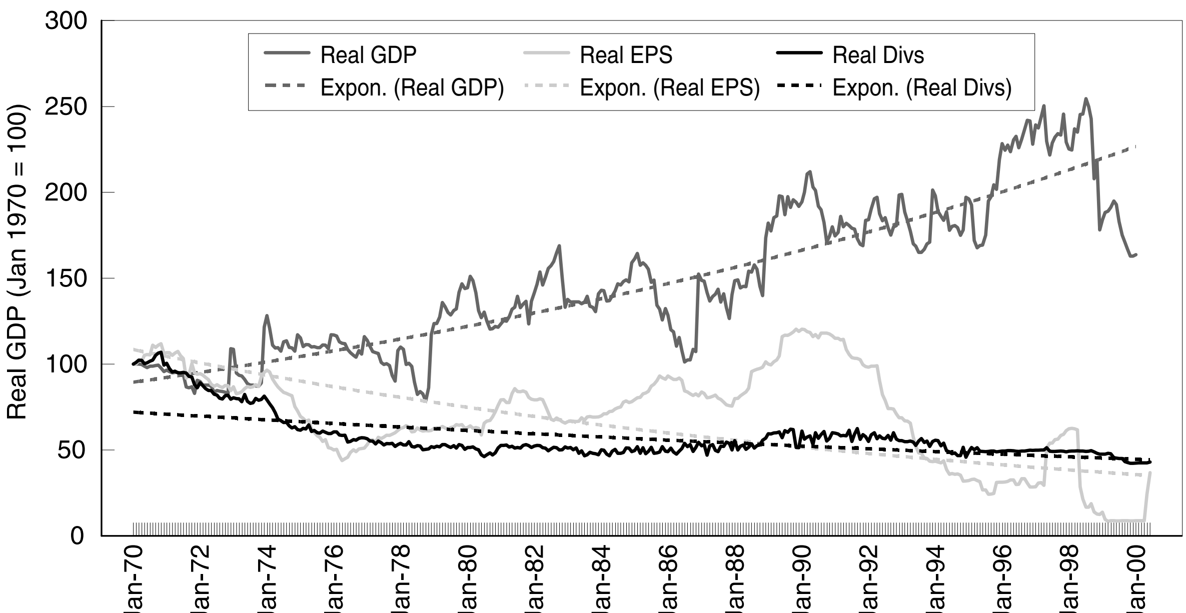
Source: Organization for Economic Cooperation and Development (OECD)

EXHIBIT 2C
U.K.



Source: Organization for Economic Cooperation and Development (OECD)

EXHIBIT 2D
JAPAN



Source: Organization for Economic Cooperation and Development (OECD)

EXHIBIT 3
GDP GROWTH AND EPS/DIVIDEND GROWTH 1969-1999

	U.S.	Canada	U.K.	Japan	Average
Real GDP	2.3%	2.9%	2.1%	1.6%	2.2%
Real EPS	1.4%	-2.2%	1.3%	-3.4%	-0.7%
Real DIV	1.1%	-0.9%	2.2%	-1.6%	0.2%
Avg(EPS, DIV)	1.3%	-1.5%	1.7%	-2.5%	-0.2%
Avg(EPS, DIV) as % of GDP	54%	-54%	83%	-156%	-11%

price/earnings ratio, fall from 7% to 3%), investors do not reduce their expectations for stock returns. We find this baffling.

WHERE MIGHT WE BE WRONG?

The most important vulnerabilities of our analysis are 1) the assertion that real dividends cannot grow faster than the GDP for long, and 2) the assumption that real GDP growth will not sharply outpace historical rates of growth. Both deserve a closer look.

We have seen that long-term growth of real dividends has been a modest 1% per year for the past 74 years. Is the U.S. experience an anomaly?

Exhibits 2A-2D and Exhibit 3 show the experience over the past 30 years in the U.S., Canada, the U.K., and Japan. If we smooth the growth curves with an exponential line-of-best-fit (the dashed lines in each exhibit), we find that two of these countries have generally seen *negative* "growth" in real earnings and dividends for the past 30 years. Only dividend growth in the U.K. and earnings growth in the U.S. have approximately kept pace with the growth of the economy.

Don't these pockets of success suggest that perhaps dividends or earnings can keep pace with GDP growth? Not really.

- In the U.S., earnings growth roughly matched GDP growth over the last 30 years (although the exponential line-of-best-fit rises barely half as fast as GDP). But, this occurred only because corporate earnings constituted a 70% larger share of U.S. GDP in 1999 as in 1969. Without this *near doubling* of profits, as a fraction of GDP, real earnings growth would have been barely over 1% per year.
- In the U.K., dividend growth roughly matched GDP growth over the past 30 years (here, the exponential line-of-best-fit confirms the growth). But, this occurred only because dividend payout ratios increased by over 50% between 1969 and 1999. Again, without this sharp increase in payout ratios, real dividend growth would have been barely above 1% per year.

Don't stock buy-backs supplant dividends, making the dividend growth both understated and irrelevant? This view is partly correct, but companies cannot sustainably spend more than 100% of earnings on stock buy-backs. If stocks are priced at 30× earnings, then 100% of earnings will suffice to buy back only 3.3% of the outstanding stock. If companies are paying a dividend yield of 1.2%, on average, then the average company can buy back only 2.1% of the outstanding stock with 100% of the retained earnings. Of course, no company can be expected to spend 100% of retained earnings on stock buy-backs, so this represents an upper bound on the potential hidden yield in stock buy-backs.

Why can't the future deliver faster real GDP growth than the past? And, would that not help us to achieve high enough real dividend and earnings growth to achieve a positive risk premium?

Those who argue in favor of unprecedented GDP growth base their outlook primarily on the technology revolution. Any casual observer of the economy would have to agree that the technology revolution is real. Its impact on future GDP growth remains to be seen. It could be modest. After all, we still need to eat food, drive cars, live in homes, and buy toothpaste and soap. Bits and bytes won't and can't replace traditional goods and services, no matter how much they revolutionize information flows and communications. But, technology could materially reduce the costs of production and delivery of goods and services, even as it redefines the world of information flows and communications. These productivity increases could lead to far more rapid GDP growth than we've seen in the past. A new Industrial Revolution could easily be in the works.

Let's take it as a given that GDP growth will materially exceed the 2.5% to 3.0% that has been normal for much of the past century. A key question: How much of this growth will come from growth in existing enterprises, and how much will come from the creation of new enterprises?

Advocates of a new Industrial Revolution would be the first to acknowledge that most of this faster-than-ever-before growth must come from the creation of new enterprises, many of which have not yet even been conceived. Investors in current enterprises *cannot* participate in GDP growth that comes from the creation of new enterprises. This means that the growth in earnings and dividends on existing enterprises *must* be slower than the growth in GDP, because of the dilution effect of new enterprise creation.

History suggests that this dilution takes place at a rate of roughly 1% to 2% per year. This means that earnings and dividend growth has been 1 to 2 percentage points lower than GDP growth, in both the U.S. and other markets, once we adjust for increases or decreases in the ratio of earnings or dividends as a fraction of GDP.

This seems modest until one considers that 3% GDP growth is generally considered a solid rate of long-term economic growth. A 1 or 2 percentage point haircut means that today's equity investors participate in only one-third to two-thirds of the total GDP growth, forfeiting the remainder to those who create new enterprises. This seems a remarkable gap, difficult to accept until one considers that:

- This has indeed been the norm in the four large economies that we have studied, as shown in Exhibits 2 and 3.
- Over 55% of the capitalization weight in the Russell 3000 index consists of companies that did not exist 30 years ago, which corresponds to roughly 2.5% per year of GDP growth stemming from the creation of new enterprises.

Venture capital investors *can* participate in the growth that stems from new enterprise creation, at substantial costs, and with substantial dilution of those gains. The entrepreneurs and the venture capitalists will tend to take a very large (and not inappropriate) first slice of the growth associated with these ventures. But, it is impossible for the same dollar of investment capital to participate in *both* the growth of existing enterprises *and* the creation of new enterprises.

Also, such enterprises often have low marginal reliance on capital, with great reliance on *skilled* labor with portable knowledge. If the marginal return to (skilled) labor is high, and if the barriers to entry in many of these enterprises are low, it will be unsurprising if the marginal return to capital is low. This would mean that the long-term future rewards to capital are not necessarily higher for these investments than for conventional equity investments.

WHAT ARE THE IMPLICATIONS OF A NEGATIVE RISK PREMIUM?

The implications of a negative risk premium are far-reaching and profound. Perhaps the most important issue is that actuarial return assumptions in pension funding today may be too aggressive. If prospective returns fall short of actuarial assumptions, then contributions must rise. If contributions do not rise today, then future contributions must rise still further, in order to catch up for underfunding of today's obligations.

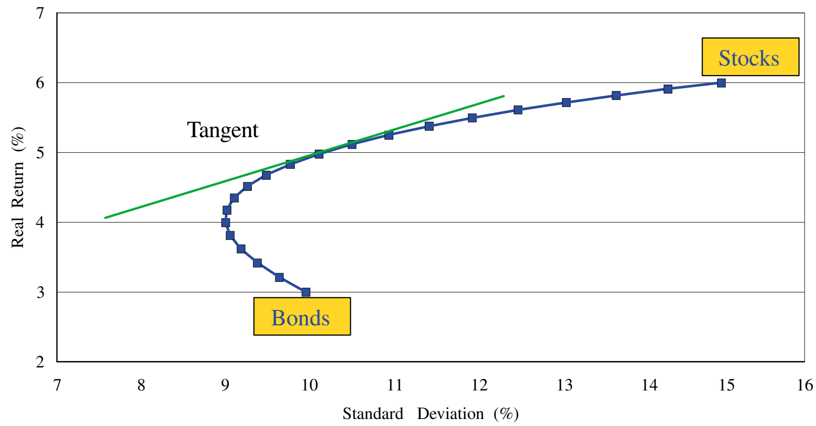
The typical range of actuarial real return assumptions falls in a range from 4.5% to 7.5%. Our own evaluation of prospective returns suggests that something in the range of 3.5% is probably more realistic. Given the fact that most pension funds have a duration of 12 to 15 years, any error in actuarial real return assumptions can have a considerable impact on the true funding ratio of a pension portfolio.[1]

For instance, suppose a pension fund has a very solid 150% ABO funding ratio.[2] If such a fund were assuming a 4.5% real return, yet earned a 3.5% real return, the true funding ratio would actually be 132%. If this fund were assuming an aggressive 7.5% real return, this 4 percentage point difference in real returns would mean that the true funding ratio is an appalling 90%. What is perceived as a healthy overfunded pension fund, with a substantial surplus, turns out to be underfunded.

If we can *anticipate* that returns will be lower than the prevailing actuarial assumptions, we have a number of choices that we can make.

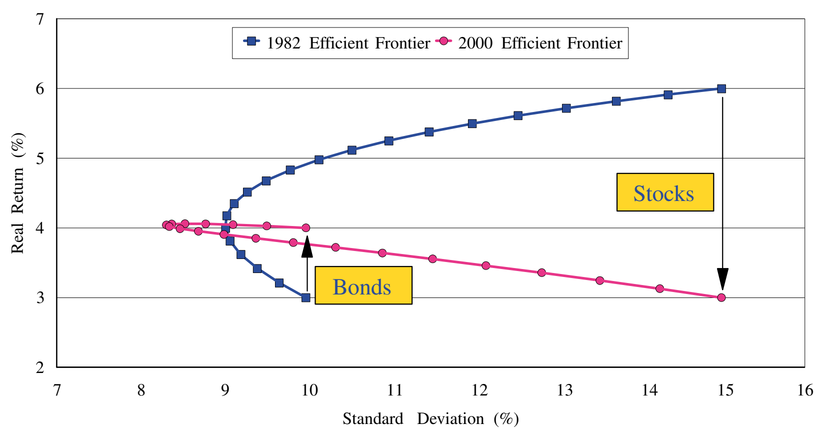
- We can choose to stay with the current assumptions, recognizing that catch-up contributions will probably be needed. This is the path of least resistance, and is a path that many actuaries will not

EXHIBIT 4A
1982 EFFICIENT FRONTIER



Simulation based on S&P historical returns.

EXHIBIT 4B
THE NEW EFFICIENT FRONTIER?



Simulation based on S&P historical returns.

resist, because their own return expectations are based on an extrapolation of the past … they just don't believe that the risk premium could possibly be gone! If actual returns fall short of actuarial return expectations over the next several years, and if contributions are artificially depressed due to overly optimistic return assumptions, the result will be a large number of sponsors a few years hence with unfunded liabilities.

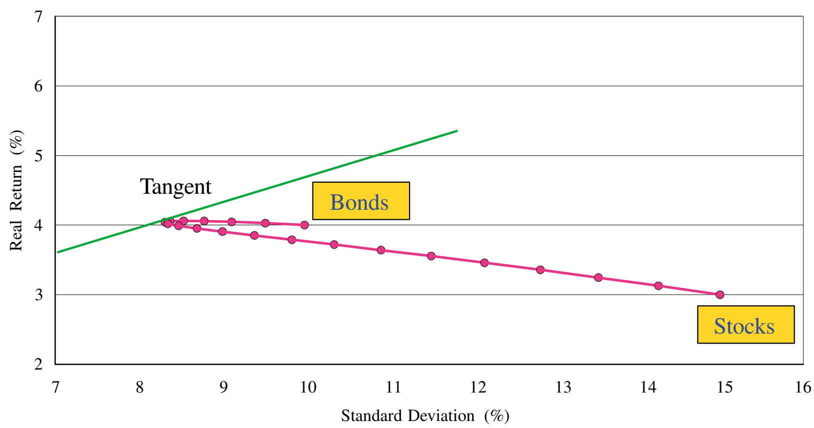
- We can choose to lower our actuarial return assumptions a little bit, in order to increase funding of the pension portfolio, but not to reduce return assumptions all the way to 3.5%. This probably means that some catch-up contributions will still be needed, but the fund sponsor will not be taking the lead by using sharply more conservative assumptions than its competitors. This can lead the sponsor to be better funded when actuarial return assumptions of its competitors eventually follow suit, thereby holding a stronger competitive position vis-à-vis competitors, with lower labor costs, stronger cash flow, and higher earnings.
- Or, we can choose to move all the way to the real returns that are likely to be sustainable from today's market levels, which would imply real return assumptions in the 4% range or less. This way, there will be no catch-up contributions required. The consequences are much more aggressive contribution to the pension portfolio and lower earnings. This weakens the *current* competitive posture of the pension sponsor relative to its peers in exchange for strengthening its *future* competitive posture with regard to its peers.

The correct choice likely depends on the health of the pension sponsor relative to its competitors or peers. It is not an easy choice; it is a painful choice.

Another nuance of the negative risk premium is that the efficient frontier "flips." In Exhibit 4, we can see an illustrative efficient frontier drawn from 1982. In 1982, stocks offered a dividend yield as high as 5.5%. It would have been very easy, at the time, to anticipate a 6% real return from equities. This expectation would imply only a 0.5 percentage point real growth in the market value assigned to each dollar of earnings or dividends. At the same time, bond yields had tumbled to just 3 percentage points above consensus inflation expectations. The consequence was the classic efficient frontier that we see in Exhibit 4A.

In today's market, we can earn roughly 4% real from inflation-indexed government-guaranteed bonds, but a reasonable expectation for equity real returns is probably in the 3% range. This transition is illustrated in Exhibit 4B. If we are correct, this would leave the current efficient frontier "flipped," or inverted, to the frontier that we see in

EXHIBIT 4C
2000 EFFICIENT FRONTIER?



Simulation based on S&P historical returns.

Exhibit 4C. A flipped efficient frontier has profound and far-reaching implications for policy asset allocation.

- In the past, the easy way to boost long-term return expectations was to put more in equities. This no longer works.
- In the past, equities were the asset class of choice for boosting returns. With a flipped efficient frontier, they become merely another diversification alternative for controlling portfolio risk. In a world of 15% returns, adding 2 percentage points through successful active management (or losing the same in a failed quest for alpha) is not terribly important. In a world of 3.5% real returns, adding or forfeiting 2 percentage points suddenly matters a great deal. The quest for alpha becomes terribly important, and the avoidance of negative alpha becomes commensurately important.

THE EARNINGS IMPLICATIONS OF ACTUARIAL ERROR

One little-explored nuance of the risk premium and of actuarial return assumptions is found in the prospective impact on corporate earnings. Corporate earnings have a component (pension expense if negative and pension earnings if positive) that is tied directly to how well the pension fund fares relative to actuarial return assumptions. It is the cost of funding the pension, less the actuarial expected rate of return for the pension portfolio.

If this is a profit center, meaning that pension obligations are growing more slowly than pension assets, this "profit" may actually go away with even a modest reduction in the actuarial real return assumptions. By the same token, if it is not a profit center (i.e., if actuarial pension obligations are rising faster than the actuarial returns on the fund), the cost of the pension will increase if a lower real rate of return is assumed.

Either way, the earnings of a company fall if the actuarial return assumption is reduced. This impact can be startlingly large.

For the Russell 3000, for instance, total defined-benefit pension assets are around $2 trillion. If the average fund is using a real return assumption that is 3% too high, and if the average fund has a duration of 12 years, then the average fund has a true pension liability that is over 40% higher than the actuarial estimate. If this $800 billion understatement of actuarial surplus is amortized over a ten-year span (keeping in mind that the Department of Labor requires five-year amortization if a plan is actually underfunded), then earnings are overstated by some $80 billion per year.

This means that a year-end 2000 P/E ratio of 28 times latest 12-month earnings for the Russell 3000 translates into a true P/E ratio, adjusted for realistic actuarial pension returns, of some 34 times true earnings. This hidden consequence of reduced future returns means that the U.S. stock market is almost 20% more expensive than it seems.

DO RETURNS REALLY MATTER?

It goes without saying that pension fund assets do not exist in a vacuum. What is often overlooked is that liabilities have returns too, and that these returns move with the capital markets, most notably with bonds.

Exhibit 5 suggests that 1999 was an extraordinary year for pension funds, because assets went up materially, and the net present value of liabilities went down. By the same token, 1995, which most people thought was a wonderful year for returns, was a dreadful year for funding ratios, due to the tremendous increase in the net present value of liabilities.

What of the decade of the 1990s? As Exhibit 6 suggests, the decade was very good, but not as good as most people think. With interest rates falling during the course of the decade, liabilities rose in value by enough to offset much of the gain in asset values.

EXHIBIT 5
AVERAGE PENSION FUND: TYPICAL EXPERIENCE IN 1999

	1999	1995
Liabilities (Ryan Labs Liability Index)	-12.70%	41.16%
Asset Allocation:		
5% Cash (Ryan Labs Cash Index)	4.24%	7.11%
30% Bonds (Lehman Aggregate)	-0.82%	18.47%
60% Equity (S&P 500)	21.53%	37.57%
5% Intl (MS EAFE)	27.35%	11.56%
Total Assets	14.25%	28.67%
Assets – Liabilities	26.95%	-12.49%

A typical, if not conservative, asset allocation ratio shows what the average pension fund should have experienced in 1999.

CONVENTIONAL WISDOM OF THE 1990S

The decade of the 1990s was in some ways a continuation of the prior decade. Markets delivered robust returns, this time from starting valuation levels at or above long-term historical norms. The consequence has been a panoply of lessons learned, some sensible, some flagrantly flawed.

That the 1990s Have Left Us Well-Funded?

Many pension plans believe they have built a reservoir of actuarial pension surplus so that the plan does not have to make contributions for a very long time. On closer examination, these plans tend to have a real return assumption for assets that resembles, or is explicitly based upon, the past. A 5%-8% real return is not uncommon (even considered conservative by some). Most pension plans use return assumptions between 8% and 10%, some even higher, with inflation assumptions typically around 2% to 3%.

This is typically considered defensible, since most institutional portfolios have achieved consistent real returns comfortably above 10% for the last 5, 10, 15, 20, and even 25 years. Yet, as we have already seen, real returns of 3% to 4% are a more realistic expectation, in today's markets.

What if a 3% to 4% real return assumption is used for the funding ratio? Many pension plans would be materially underfunded. The typical pension fund has a duration of 12-15 years, meaning that a 1 percentage point change in the discount rate or in the return assumption leads to a 12%-15% change in funding ratios. Yet, we have already seen that 3% to 4% is a reasonable real stock market return expectation from current market levels, and that 5% or more requires some rather aggressive assumptions.

If real return assumptions are cut by 2 or 3 percentage points from current levels, most funds would find their ABO funding ratio drops by 25% to 40%. For example, a fund that has a lofty "official" ABO funding ratio of 160% might find the true ratio is 96% to 120%.

That Stocks Are the Best Investment for Long-Term Investors?

Stocks have outperformed government bonds by over 5% per year over the past 74 years, and by a far wider margin over the past 10 to 25 years. Stocks have exceeded inflation by over 8% a year for the past 74 years, and, again by a far wider margin during the 1990s.

But extrapolating the past is one of the most common and dangerous ways to forecast the future. The past is not prologue. In fact, there is a modest, but significant, negative correlation between long-term past returns and subsequent future long-term real returns.

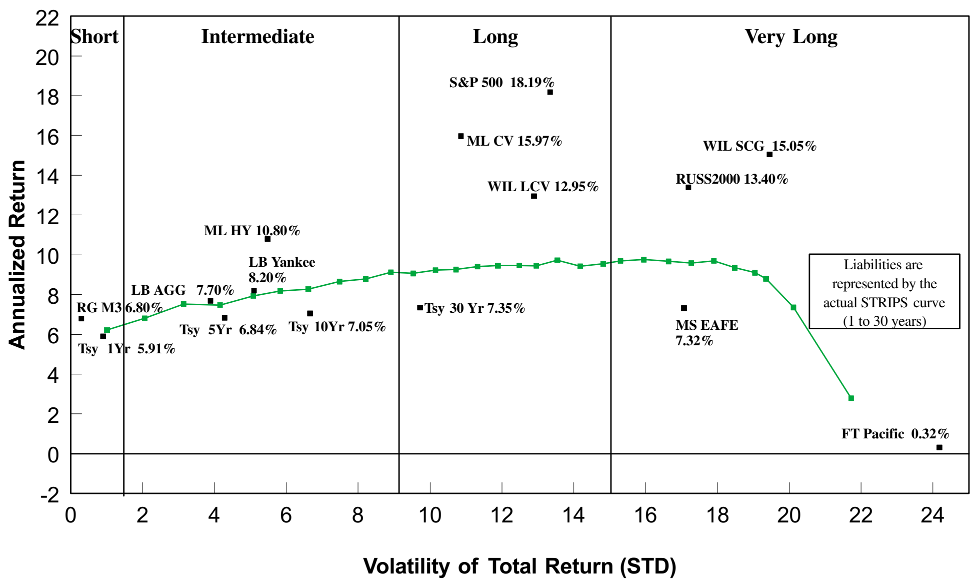
Any student of history can point to extended periods in which stocks have not produced an excess return. From the end of 1961, an investment in Treasury bills outpaced both stocks and bonds through mid-1982, a span of 20-plus years. From the 1929 market peak, stocks underperformed bonds over the subsequent 17 years and needed 25 years to outpace Treasury bills. For the investor in 1801, by some measures, stocks merely matched bonds over the subsequent 70 years.

That to Boost Funding Ratios, Boost Returns: Invest More in Stocks?

Given that the long-term inflation-linked bonds (TIPS) are yielding over 4% today, there is a government-insured risk-free real return vehicle that not only could beat stocks over the next 20 years, but probably *will.* It is our view that extrapolations of the past have been used to justify a shift in asset mix for the average pension fund from roughly a 50/50 stock/bond mix in 1980 to roughly a 75/25 mix in 2000. The evaporation of the risk premium lays a foundation for a legitimate reexamination of the appropriate policy asset mix and of the key assumptions for that mix.

The traditional asset allocation approach is to seek the highest possible absolute return at an acceptable level of volatility (risk). This view of risk and reward appears in the graph that plots the asset returns on the vertical axis

EXHIBIT 6
ASSET/LIABILITY MONITOR (TEN-YEAR PERIOD ENDING 12/31/99)



and the variability of returns (standard deviation) on the horizontal axis. Most asset allocation models tend to be silent on the subject of pension liabilities. That is, they tell pension management nothing about where the pension plan should be positioned vis-à-vis the liabilities. Organizations with mature work forces (shorter liabilities) should hardly want the same asset allocation as organizations with young work forces (longer liabilities).

One way to think about the correct role of liabilities in fund management is to redefine risk relative to those liabilities. In so doing, the risk-minimizing portfolio is *not* T-bills, but instead the mix of assets that offers the best fit with the liabilities (liability index fund). And, the optimal portfolio is the portfolio that offers the best increment of return above the return of the liabilities, with acceptable risk relative to the liabilities.

If the shape of pension liabilities shapes the asset allocation process, then a fully funded risk-minimizing plan for an older mostly retired work force, with 20% in long-term liabilities (liabilities longer than ten years), would allocate only 20% to long assets, while another risk-minimizing plan for a young work force, with 80% in long liabilities, would allocate 80% to long assets. Indeed, we would argue that asset allocation should strive to optimize the *relative* return of assets (asset growth) to the growth in liabilities.

Exhibit 6 shows a line that represents the annual growth rate of liabilities for each year of liabilities up to 30 years over the 10-year period ending December 31, 1999. Please note the risk/reward behavior of assets (the black boxes) versus the points on the liability line. Vertical lines separate the short, intermediate, long, and very long assets and liabilities. Notice that cash equivalents behave like very short liabilities; bonds behave like intermediate liabilities; long STRIPS (Treasury zero-coupon bonds) and stocks behave like long liabilities; and international securities behave like very long liabilities.

MSCI EAFE is a case in point. Even though it outperformed the one-year T-bill, it severely underperformed the very long liabilities that it behaves most like (volatility). At least during the 1990s, EAFE would not have been a good asset allocation choice to fund very long liabilities. In fact, very long Treasury STRIPS would have outperformed EAFE by a considerable margin, and would have funded the liabilities without risk.

Asset allocation is a risk/reward decision between the low-risk liability-matching asset (Treasury STRIPS) and an asset class that will outperform this liability area with similar volatility (risk). It is not a contest to find the highest absolute return. You would not buy stocks to fund short liabilities, because their risk/reward behavior is not appropriate. Nor should you buy cash equivalents to fund long liabilities.

Asset allocation is the process of matching the volatility of liabilities with assets that can generate the same or greater growth. The S&L crisis is still a vivid lesson of what happens when you mismatch assets to liabilities by risk or volatility patterns.

That Liability Matching Is Less Important Than Asset Returns?

Pension fund assets have grown to a point where they often make up the bulk of a company's or public sponsor's total assets. The variability and rate of return of the pension assets affect company profitability and budgets and a sponsor's tax rates. In both cases, pension "success" has enormous (even if smoothed) impact on competitiveness with one's peers, company against company or state against state. So pension sponsors have an obligation to give the pension fund as much attention as any significant operating division.

Traditionally, actuaries provide low asset/liability volatility (smoothing) by adjusting return assumptions on the assets and discount rates for the liabilities with only modest change from year to year. Reality is much different. Appropriate discount rates for liabilities move every bit as quickly as bond yields change. Appropriate return assumptions move every bit as quickly as changes in bond yields and stock earnings yields (the reciprocal of the price/earnings ratio, itself a crude proxy for forward-looking real stock market returns).

The difference between these forecasts and reality is then amortized over some long average life. As a result, pensions have misunderstood the true objective of pension thinking: that the actuary estimate is their target growth rate for assets.

Enter FASB 87, which rules that the interest rate risk employed to calculate the present value of the liabilities is no longer the actuary's province. Market interest rates must now serve that purpose, so that liabilities are priced as if they were a portfolio of high-quality zero-coupon bonds whose maturities match the liability payment dates and whose par values match the liability payment amounts. While there is a certain latitude available to the actuary in selecting a rate that is *near* this market rate, liabilities are now more correctly calculated and are now seen as a volatile, and extremely interest rate-sensitive, part of the pension puzzle.

But, even as liability discount rates are forced to be more strongly based on market yields, actuaries have wide latitude in inflation assumptions and in the return assumption for the assets. This latitude is liberally used to provide a very steady real return assumption, at a level that is not altered to reflect market valuation levels.

THE "RIGHT WAY" TO VIEW THE ASSET/LIABILITY PUZZLE

The way we deal with risk depends on how we define it. This is often a more complicated task than appears. In pensions, risk is not funding liabilities correctly. Since pension assets are the primary source of funding liabilities, risk here can be measured only when you compare the risk/reward of assets vis-à-vis the liabilities they are funding. *The no-risk asset is the asset that funds the liability with certainty.* A risky asset is one that has much uncertainty about its risk/reward behavior vis-à-vis the liability it is funding. The risk-free asset to fund a ten-year fixed liability would be a ten-year Treasury zero-coupon bond (STRIPS).

This is why FASB ruled that liabilities are to be priced as high-quality zero-coupon bonds, because they represent the no-risk portfolio. Assets are to be compared to this zero-coupon liability portfolio to understand the relative risk and reward such assets produce in their goal to fund liabilities.

Until the growth rate and the volatility of liabilities are correctly measured and analyzed, pension risk can never be understood and managed properly. Since all pension liabilities are different and unique to each plan, only a custom liability index could represent the true pension liability objective. Once a custom liability index is designed, then and only then can we make the policy asset allocation decisions, notably, the appropriate departures from the risk-minimizing portfolio. The risk-minimizing asset allocation depends on a custom liability index for its shape of liabilities.

Proper asset management and performance measurement should be a constant monitoring of assets compared to liabilities. Generic market indexes may help us to understand the risk/reward behavior of certain markets, but they can never tell you the risk/reward behavior of your portfolio *relative to the liabilities.* As basic as it sounds, the pension industry has operated with the wrong objective since birth. Outperforming a generic market index is not the objective. *Outperforming liabilities with acceptable volatility, relative to those liabilities, is the objective.*

Surplus Management in the Years Ahead

1999 was a stellar year for the pension industry, just as 1995 was truly awful. How can this be, when returns in 1999 were less than half the returns of 1995? The problem in 1995 was that liability returns were spectacular as a consequence of falling interest rates. 1999 was stellar because assets for most funds rallied while liabilities actually tumbled, as a consequence of rising interest rates.

The capital markets have granted the pension industry a "reprieve," an opportunity to reexamine the basic assumptions that form the basis for policy allocation decisions, at a time when liabilities have fallen sharply and funding ratios have soared.

Given that the asset/liability ratio should have improved by about 25% in 1999, it is timely to reappraise the asset/liability strategy. If there is a meaningful pension surplus, it would be wise to separate the surplus assets into a distinct and separate objective portfolio. This portfolio could welcome almost any type of asset allocation since the investment time horizon is in perpetuity, and there are no liabilities funded from this portfolio. More aggressive investments that have great potential but need time to develop would be ideally suited to this portfolio.

It would seem practical to have a long-term growth rate target as the proper benchmark here rather than the traditional "beat thy neighbor" peer group contest traditionally run in pension land.[3] There are several ways to manage fund surplus, in the context of liabilities.

Strategy I: Surplus Portfolio (Ongoing Plan). The strategy here is to secure the pension surplus and facilitate surplus growth through the surplus portfolio, not the A/L portfolio. To secure the pension surplus requires the asset/liability portfolio to be strictly managed to pay liabilities when due. This would suggest a cash flow-matching strategy.

The retired lives liability is an obvious candidate for this strategy since these liabilities are the most important and the most certain. The active lives liability is less certain and has some volatility, but it too needs a strict asset/liability strategy, since that is the objective of these assets. The idea is to make funding liabilities properly the objective instead of some generic market indexes that may have no correlation at all to the clients' liability schedule.

A custom liability index that best fits each client's unique liability schedules represents the liability objective. Once calculated and maintained, a custom liability index fund would be the best strategy to fund this liability at the lowest cost and the lowest risk to the plan.[4]

The assets that are not required to match the known liabilities constitute the pension surplus. These assets can then be managed in a fashion that matches the plan sponsor's appetite for returns and tolerance for risk.

Strategy II: Liability Defeasance (Terminated/Converted Plan). Under IRS Section 417, a company can defease liabilities in a plan termination or conversion by pricing them at the average of the bond-equivalent yield (BEY) of the 30-year Treasury for the month of December prior to termination. This rate is locked in for one full calendar year. Calendar year 2000 has been expected to enjoy the highest rate (lowest cost) since 1996 (1996: 6.55%, 1997: 6.00%, 1998: 5.05%, 1999: 6.35%).

Defeasement means that a company matches its portfolio of liabilities with assets of equal value, dedicated to meeting the projected payouts and thereby securing the pensions for the retirees. By doing this, the law permits the company to remove the liability from the balance sheet, thereby improving its financial ratios. In addition, the company is permitted to take a reversion and remove any surplus assets from the pension plan for its own use, paying taxes and in some cases modest penalties for access to these assets.

Defeasement, by definition, requires a 100% bond portfolio, with heavy emphasis on zero-coupon bonds cash flow-matched to the liability payout schedule. Once defeased, surplus is now the property of the employer rather than the employees. It can be used for any corporate purposes, as it is now part of retained earnings. Financial ratios are also enhanced, thereby reducing debt ratios and improving creditworthiness.

It should be noted that there are costs and consequences of defeasement that make this an unappealing alternative for any but the most mature and risk-averse sponsors. In the act of defeasing and removing surplus from the fund, the sponsor is walking away from an opportunity to shelter current and future income from taxes as well as an opportunity to invest on a tax-deferred basis. Funds invested in a pension fund avoid current tax, and accumulate on a tax-exempt basis.

A pension fund, managed on a going-concern basis, can reduce future pension funding costs. Accordingly, asset returns in excess of liabilities serve to reduce future pension contributions dollar-for-dollar on tax-exempt earnings.

Asset Management in the Context of Liabilities

For the going concern, an exact match of assets to liabilities is clearly not necessary. It is merely one of many interesting alternatives. Even if an exact match is selected as a means of managing pension risk, the surplus (the residual assets above those required to defease the liabilities) is a very interesting vehicle for tax-deferred and tax-exempt investing of company resources.

But these decisions should be made in the context of the liabilities; frequently they are not. If nothing else, the fund sponsor should be well aware of 1) the nature of the liabilities, 2) the mismatch between the assets and the liabilities, and 3) the corresponding risks taken with what, in truth, is a company asset, the surplus.

A CALL FOR ACTION?

Suppose we are correct that the equity risk premium is gone. Suppose we are correct that real returns on stocks are likely to be in the 3%-4% range for the foreseeable future (10-20 years). Suppose we are correct that the real returns the actuaries assume are no longer sensible. What does this all mean?

1. It is more appropriate now than ever before to revisit the policy asset mix for a portfolio. Funds have drifted to a 70%-80% equity stance as the accepted norm, at a time when the equity excess return over bonds appears to have vanished, up from 50%-60% 20 years ago.
2. Funding ratios are probably not as healthy as they appear. This presents companies (and states and counties) with a choice. Do we continue to make assumptions that are no longer realistic, in order to keep pension contributions down? This implies that future funding must cover not only the future costs of pension obligations, but also catch up payments for today's arrears. Or, do we move in the direction of more realistic assumptions in order to improve our *future* competitive position by fully funding current obligations and enjoying the tax-exempt returns that can save us substantially on future contributions? There is no right answer to this question—but it is a question that must be asked, and of late has not received much attention.
3. If returns don't necessarily improve pension health and wealth, due to the subtle interplay between asset and liability returns, what is the return objective? We would posit that a 10% market rally boosts fund wealth by a small fraction of 10%, due to the reduction in subsequent prospective rates of return. On the other hand, 10% earned through alpha is a true 10% improvement in fund health, by any measure. Accordingly, the quest for alpha is a key aspect of the fund management puzzle.

Following the decade of the 1990s, which took the forward-looking real returns available from stocks to all-time lows, and the experience of 1999, which improved funding ratios to the best seen since 1996, fund sponsors owe themselves a careful reexamination of their asset allocation policies, beginning with a reevaluation of their key assumptions.

ENDNOTES

[1]The duration of a pension fund is a measure of the sensitivity of funding ratios to any change in return assumptions. In effect, the duration measures how much the funding ratio would change with a 1% change in return assumptions. For instance, a duration of 12 years would mean that a 1% change in real return assumptions would trigger a 12% change in funding ratios. This is closely related to the liability duration, which is the number of years until the *average* current obligation becomes payable, weighted by the dollar value of that liability. The two concepts are interconnected and tend to be a similar number.

[2]ABO funding ratio is the *accumulated benefit obligation*. This is the net present value of current obligations of a defined-benefit or cash balance pension portfolio, discounted at the actuarial discount rate, credited with the actuarial return assumption, and reflecting only the pension obligation that is due and payable as a consequence of current years of service. No prospective growth in pension obligations from future years of service, from future wage inflation, or from future changes in the benefit formulas, or from future returns that are above or below the actuarial return assumption is considered.

[3]The decisions of one's peers and competitors should not be the key determinant of asset allocation policy, although they often tacitly are. That said, we would readily acknowledge that "maverick risk" (the risk of underperforming one's peer group or competitors) is not without import or merit. It is important, if only because of the career risk that accompanies large departures from one's peer group. It has merit if only because underperforming one's peers means higher future pension costs than one's peers, hence a lower profit margin (or, for public funds, higher taxes) than one's peers, assuming the liability structures are comparable.

[4]Some words of caution about traditional immunization (cash flow matching). Immunization tries to match the present value of assets to the present value of liabilities. Too often this is implemented by matching the average modified duration of the asset portfolio to the liability portfolio. Duration-matched immunization models do not fit the cash flows with precision. The risk match is good, but distinctly less than exact: If the slope of the asset pricing yield curve or the liability pricing yield curve changes its shape, immunization models will usually fail. Only when the entire term structure is matched (all liability payments) is cash matching optimal. This is why a custom liability index fund represents a better fit, since the entire term structure is matched, not just the average duration.

REFERENCE

Welch, Ivo. "Views of Financial Economists on the Equity Risk Premium and Professional Controversies." Working paper, Anderson Graduate School of Management, University of California/Los Angeles.