

# **The Four Dimensions of Investment Return**

**Keynote Speech by  
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Your theme for this forum—“Navigating in a New Market Environment”—seems an uncannily appropriate and timely opportunity for an address by a person who, entranced by the mystery of the sea and captivated by the great naval history of the Napoleonic wars, founded a mutual fund company with a unique concept and named it after one of the most renowned flagships of the British navy.

It was aboard HMS Vanguard on August 1, 1798, almost precisely 200 years ago, that Lord Horatio Nelson routed Napoleon’s French fleet off the mouth of the Nile. When in the late summer of 1974 I happened to read the proclamation he wrote from the deck of the Vanguard describing “the great victory over the fleet of the enemy, the truly meritorious conduct of the crew, and the high state of discipline, judgment, and valor of the captains,” I was inspired to choose the name of his flagship for our budding new enterprise. From that fortuitous beginning developed the nautical theme that punctuates so many aspects of Vanguard’s corporate character, including the three-word expression that is probably the most appropriate aphorism ever conceived to describe a sound strategy for long-term investing: “stay the course.”

The objective of long-term investing is the accumulation of wealth, which in turn depends on achieving an optimal rate of investment return. And investment return, it seems to me, has four dimensions. Three are the simple dimensions of space: length (which I’ll describe as reward), breadth (risk), and depth (cost). But to these three spatial measures, I must add the fourth dimension: time. All four dimensions are inter-linked in tantalizing ways, sometimes obvious, sometimes subtle. I’ll discuss those links during this talk. But for now, let me stress that weighing each of them properly in the light of the goals you wish to achieve is the key to any sound investment program, and deserves particular attention today in what your agenda describes as a “new market environment.”

## **Reward—The First Dimension**

Because it is the longer of the two straight-line dimensions of a surface, I use “length” to describe reward. So also must reward must be given primacy as a factor in the process of wealth accumulation. Looking back over the past three-plus years, during which the stock market, with an annualized return of an astonishing 30 percent, has turned each \$100,000 of equity value into \$220,000, building assets has seemed easy. Indeed, during the great bull market that began with a totally unexpected surge on August 20, 1982, the market has advanced at an annual rate of 20%, an even more astonishing rate sustained, as it has been, over a period now nearing 16 years in duration. During this boom period, each \$100,000 of initial equity value has increased to \$1.6 million.

That said, financial markets have demonstrated a truly remarkable tendency to revert to the mean over time. The U.S. stock market, measured since 1801—a period of almost two centuries—has been no exception. Wharton Professor Jeremy J. Siegel, in his best-selling book “Stocks for the Long Run” notes

that the real (after inflation) returns on equities have averaged 6.7 percent annually.<sup>1</sup> Over 25-year measurement periods, the high range of real returns (9 percent to 11percent) came in the periods ending in the 1880s, the 1950s and 1960s. The low range (below 4 percent) came in the late 1850s, the 1930s, and (believe it or not) during the entire decade of 25-year periods ending in the 1980s, when high inflation sharply eroded very good nominal returns. All that glitters is not gold!

The real return during the past 25 years has—and this may surprise you—been *exactly* 6.7 percent, so perhaps we are merely living in a normal era. Yet it would be unwise to lose sight of the fact that the 12.8 percent real return of the past 15 years—almost double the long term norm—has only been exceeded in a half dozen of the 181 periods of like duration covered by Professor Siegel. In the light of that fact, many investors are reevaluating the question of whether U.S. stocks should remain the predominant asset class in the allocation of an investment portfolio today.

One thing is clear. The investment fundamentals are far less attractive today than in mid-1982, when the bull rampage began. Then, stocks were priced at a multiple of 7.9 times earnings. Today, at 25 times earnings, they are more than three times as richly valued. Then, one dollar of dividends could be purchased for but \$16 (a yield of 6 percent). Today, with the yield at 1.4 percent, a dollar of dividends costs \$71—almost four times as richly valued. Dividends may not matter any more (or, as it could happen, they may!). But if a price of \$71 is not too high, there must be *some* price that is too high to pay for that dollar.

In any event, impassioned arguments rage about today's valuations. Recently, *Washington Post* columnist James Glassman and Kevin Hassett of the American Enterprise Institute reassured the bulls. Under the four-column banner headline, "Are Stocks Overvalued? Not a Chance," *The Wall Street Journal* gave their article extraordinary prominence. Using the Siegel data, the authors concluded that stocks, based on their long-term historical returns, were *less* risky than bonds. So they asserted that equities no longer required their historical (modern era) risk premium of 4.8% over bonds. *Indeed, equities required no risk premium at all.* With bond yields at 5.9 percent, and the assumption that both earnings and cash flow on equities would grow at a nominal rate of 4.9%, the authors, "using a simple and accepted formula," concluded that the justifiable price-earnings ratio for stocks (I hope you don't shock easily!) is 100 times. With this potential four-fold increase in stock prices, they concluded, "pundits who claim the market is overvalued are foolish."

An eminent dissenter quickly fired back. Two weeks later, under the two-column headline "Stocks Undervalued? Well Not Quite," Professor Siegel himself responded. "It is totally unrealistic, and contrary to historical data, to assume that investor cash flows grow at the earnings rate." (Only about half of earnings are distributed to investors.) So, "real returns should equal—and have equaled—the earnings yield. At a 4 percent yield (price-earnings ratio of 25), "the future real return from stocks will decline markedly," to about the same as real returns on bonds (3 to 4 percent, net of 2 percent inflation). "So prospectively stocks have already closed most of the return gap with bonds, and the equity premium has nearly disappeared . . . It is wrong to say that stocks are underpriced at current levels . . . In no way can the high stock returns of the past five or 15 years persist."

Irrespective of what the future holds, however, it seems to me that equities should remain the investment of choice for the long-term investor. Those who believe the market's incredible momentum

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<sup>1</sup> This 6.7 percent return has been quite steady over the three eras covered in his studies: 1801-1871 (reconstructed from a variety of sources), 1872-1926 (the Cowles Commission Study of the early 1930s), and 1927-1998 (the so-called modern era, based on the comprehensive data in the Standard & Poor's indexes).

and cash flow will continue, and accept the thesis that we are indeed in a new era of global growth, will hold the line in their equity allocation. But those who believe—as I do—that fundamentals such as earnings and dividends matter (I'll discuss that in a moment) and that, in the fullness of time, historic norms will prevail, should consider at least some leaning against the powerful wind which is driving the high returns in this great bull market. There is no way to be certain whether or not we are now experiencing an asset-price bubble. (*The Economist* says yes; *The New York Times*—and implicitly the Federal Reserve—says no.) But in the financial markets it is always wise to expect the unexpected.

### **Risk—The Second Dimension**

With this review of the prospects of reward in equities today, let me turn to risk—the second dimension of return. What breadth is to length in spatial terms—the *lesser* of the two sides of the plane—so, in terms of investment strategy, is risk to reward. That is not to say that risk is unimportant. It is crucial. But I simply do not accept that it should be counted *equally* with reward in calculating what we have come to know as “risk-adjusted return.”

Risk is one of the hallmarks of equity investing. Looked at simply, it is the uncertainty of return. In the average one-year period since 1801, the standard deviation of real stock returns has been 18.1 percent (all-time high +66.6 percent, all-time low -38.6 percent). But for long-term investors, the risk diminishes sharply, with a standard deviation of 4.4 percent (high 16.8 percent, low -4.0 percent) for ten years and 2 percent (high 11.7 percent, low 2.0 percent) for 25 years. So, the investor's time horizon itself makes risk an elusive concept, inevitably inter-linked with the rewards of investing.

The consummate measure of risk-adjusted return is the Sharpe Ratio—the excess return (over the risk-free rate) of an investment program, divided by its standard deviation. The essence of this formula is that one unit of risk is counted as the equivalent of one unit of return. But the reality of investing, as I see it, is that an extra percentage point of standard deviation (a rough proxy indeed for the elusive concept of risk) is *meaningless*, while an extra percentage point of long-term return is *priceless*. To be sure, large differences in risk are extremely important—there *is* a difference between a stock portfolio and a bond portfolio—but the simple expedient of weighting them equally on a formulaic basis leaves much to be desired as a factor in setting long-term strategy.

Since stocks have markedly different risk characteristics than bonds, the risk premium is not going to go away. The Glassman/Hassett thesis outlined in the *Wall Street Journal* to the contrary notwithstanding, simple logic would compel the conclusion that a *certain* final outcome that is predictable *on a straight-line basis* (compound interest, for example) is more attractive than the same certain final outcome when it is subject to wide variations above and below the norm during an extended time period (i.e., a stock portfolio with a guaranteed long term return).

So, the question is: What is the proper risk premium? 2 percent? 3 percent? 4 percent? I don't know the answer, but—using the “simple and accepted formula” that both Glassman/Hassett and Siegel accept and assuming, as they did, 4.9 percent growth, but also positing a 50 percent dividend payout, I did some calculations of my own. Fact: if the risk premium were 2 percent, the proper price-earnings ratio for stocks today would be 17 times; at 3 percent, 12.5 times; and at 4 percent, 10 times. These price-earnings ratios, if they were to come into effect overnight, would (merely) reduce stock prices at today's 25 price-earnings ratio by 32 percent, 50 percent, and 60 percent respectively. Even granting that the U.S. economy is far less risk-prone today than in the 19<sup>th</sup> century and the first half of the 20<sup>th</sup> Century, when the premium averaged 3.7 percent, a premium of half that amount would suggest that the stock market is hardly cheap today.

As I read the survey from the Institute for Private Investors, you have come to a similar conclusion, gradually replacing traditional common stock investments (now 51 percent of the typical portfolio), with a variety of non-traditional alternative assets, as they are called, in hedge funds and relatively illiquid assets such as venture capital (emerging companies), private capital (more seasoned enterprises), and hard assets such as real estate and energy. Gold, the consummate contra-cyclical holding, seems to have lost its luster, as it were, presumably because of years of inferior returns.

It is difficult to measure the degree to which risk has been reduced, since the absence of current prices for illiquid investments makes volatility measures difficult to calculate. But, so far at least, it does not appear that these alternative approaches have been successful in enhancing returns. While I have no data for private investors, I did read with interest the report of the Harvard Endowment Fund, the nation's largest university fund. It reported beating its new benchmarks—one for each of its new asset classes—by nearly six full percentage points in its 1997 fiscal year, even better, the Fund reported, than its 3.7 point margin for 1996. Self-congratulation accompanied the publication of the endowment fund's Annual Report: "I thought we reached the top last year, but this year has been even better" said the president of Harvard Management Company, and BARRON's joined in, calling the strategy "shrewd" and describing returns as "some of the best performance in the academic world." For the year, Harvard's gain was 25.8%.

But wait a minute. That six-point advantage was versus the composite return of the *new* asset classes. What about the traditional standard for endowment funds, based on 65 percent of assets in stocks and 35 percent bonds? A quick analysis provides the answer: +25.4%. (Based on the Standard & Poor's 500 Index, up +34.7%, and the Lehman Aggregate Bond Index, +8.2%.) An 0.4-point gain over this traditional standard would hardly seem worthy of the BARRON's headline: "The Best and Brightest."

It is my impression that other institutions that have taken this more eclectic approach to asset classes—and to the creation of new benchmarks—have also lagged the traditional 65/35 benchmark. On balance, these often substantial forays into alternative equity investments at the expense of U.S. stocks seem to have provided returns far short of the (admittedly astonishing) 30% annual return on the Standard & Poor's 500 Index itself since the re-emergence of the great bull market at the start of 1995.

While venture capital may have done somewhat better, hedge funds and private equity have lagged, and foreign equities (especially emerging markets) have been downright disappointing. One large endowment fund that I have studied, for example, has an allocation of only about 20 percent U.S. equities, compared to 20 percent in international equities, 25 percent in hedge funds and 20 percent in private equity and venture capital. During the past three years, the endowment fund has achieved a 20 percent return, versus 24 percent for the traditional 65/35 benchmark.

Since they moved into the mainstream of institutional investing, then, alternative investments have not distinguished themselves. But the strategy is hardly foolhardy. International stocks do reduce—at least to some degree—the volatility of a U.S. portfolio. And if their relative returns were merely to revert to their long-term means, international equities, having lagged for a decade, might well enhance the results of the total equity portfolio.

With respect to venture capital and private equity, it would be unwise to forget that, even as these *asset classes* diversify the risk characteristics of an equity portfolio, the *investments* themselves carry a higher level of specific risk than liquid securities. Nonetheless, it is probably reasonable to assume that in the long run illiquid investments should provide a premium return over freely marketable issues, suggesting that a significant commitment in these areas could also enhance returns for investors to whom

liquidity is not a major concern. The pallid past, then, may well be the precursor of a favorable future, one in which both reduced volatility and enhanced relative returns are achieved by the use of non-traditional asset classes.

### Cost—The Third Dimension

These first two elements of reward and risk are the accepted dimensions of investment return. We all regularly consider risk-reward relationships in conceptual terms and even quantify them, as in the aforementioned Sharpe ratio. But there is another critical factor in returns comparable to the depth that gives a geometrical figure its third dimension. It is cost. And its impact on reward and risk cannot possibly be overstated.

Cost can be looked at in two ways. First, as a simple reduction of gross return. An investment program with a return of 10 percent earned by a manager who receives a fee of  $\frac{1}{4}$  of 1 percent provides the investor with a net return of  $9\frac{3}{4}$  percent, while the same return from a manager charging  $\frac{3}{4}$  of 1 percent provides the investor with  $9\frac{1}{4}$  percent. A long-term investor considering a compound interest table will immediately observe that \$1 million invested over a 25-year period in the former program yields a terminal value of \$9.1 million; in the latter, \$10.2 million. *That \$1.1 million difference exceeds the entire initial investment.* And if, in the long run, gross returns of managers—good and bad, lucky and unlucky alike—tend to regress to the market mean, cost *must* become a vital element in the manager selection process. More than parenthetically, I note that the entire 10 percent market return would produce \$10.8 million over 25 years.

Second, cost can be looked at, not as a consumer of *return*, but as a consumer of the *risk premium*. If, for example, a large cap manager charges a fee of  $\frac{1}{4}$  of 1 percent and a small cap manager charges a fee of  $1\frac{1}{4}$  percent, that one point differential would in fact consume 40 percent of the risk premium of  $2\frac{1}{2}$  percent that the marketplace has accorded small cap stocks over large cap stocks during the past half-century.

While cost matters in every far flung corner of the world of investing, it matters most where it is the highest. The exceptionally high costs that characterize much of the mutual fund industry mean that returns earned by investors in the industry in which I participate are astonishingly sensitive to cost. Consider, for example, that the operating expense ratio of the average equity mutual fund is 1.5 percent. In addition, estimated portfolio transaction costs average at least 0.5 percent, bringing asset-related charges to 2.0 percent. Then, for funds charging traditional front-end sales loads, amortized over a 10-year holding period, add a minimum of another 0.5 percent. Total annual cost for such a mutual fund: 2.5 percent. For the one-fourth of all funds with the highest fees, 3.0 percent (including sales loads).

I simply cannot imagine that any reasonably sophisticated and intelligent investor seeking to put a substantial sum to work—any of you here today, for example—would select one of the funds in the high-cost category, nor, I think, would you be apt to select a fund with a sales load. But consider the impact of even average costs, two percent annually, on a long-term investment in mutual funds. While, as I have noted, a 10 percent *market gross return* would carry \$1,000,000 to \$10.8 million over 25 years, the commensurate *fund net return* of 8 percent would provide but \$6.8 million—a \$4 million penalty that can be charged primarily to high—I would argue, excessively high—mutual fund costs. Surely, when a full market risk is assumed, receiving 63 percent of the market's terminal value is hardly an adequate reward.

Costs of this dimension would consume such huge portions of the risk premium as to fundamentally alter the asset allocation decision. For example, assume that the risk premium were three percent (stocks 9 percent, bonds 6 percent). If a 100%-stock portfolio carried a two percent expense level, it would consume two-thirds of the risk premium and return but 7.0 percent. That same exact return, however, could also be achieved by a 33/67 stock/bond *market* portfolio. For a more venturesome—if still conservative—investor, a 67/33 stock/bond market portfolio would return 8.0 percent, a full percentage point *more* than a costly mutual stock fund invested 100% in stocks. These examples demonstrate the raw power of cost. Clearly, cost has earned its spurs as the third dimension—the depth—of investment returns.

And I have addressed only a portion of the cost issue—*investment expenses*. But *taxes*, at least after this long and immensely profitable era for equities, take an even greater toll on the investment returns earned by taxable investors. I don't mean to pick on mutual funds, but they are, as a group, notoriously inefficient from a tax standpoint. Their portfolios are typically managed with utter disregard for tax considerations. Annual portfolio turnover *averages* 90 percent, equivalent to owning a brand new list of holdings every 13 months. The penalty would be quite detrimental enough even if the resulting gains were subject to today's maximum 20 percent tax rate on long-term gains. But I estimate that last year about 30 percent of mutual fund gains were short-term in duration (40% maximum tax rate) and 20 percent were mid-term (28% rate). Thus, the approximate eight percent capital gain distribution paid by the average fund would have penalized returns by fully 2.2 percentage points. (I should note that, as it happened, the average equity fund actually lagged the market during the year by an amazing 6.1 percentage points *before taxes*.)

A fine long-term study on the tax penalty was presented in the *Journal of Investing* last spring. James Garland, president of the Jeffrey Company, compared the hypothetical after-tax returns of an investor in a typical fund and a tax-managed index fund over the 25 year period 1971-1995. During this period, the Standard and Poor's 500 Index earned a compound rate of return of 12.0 percent (*before taxes*). After expenses and taxes, the mutual fund compounded at 8.0 percent and the tax-managed index fund at 10.2 percent.

In all, the fund investor relinquished 16 percent of final fund total return to the fund manager and 44 percent to the government, retaining but 40 percent of the theoretical tax-free market return. For the index fund, 6 percent of the final value accrued to the manager and 27 percent to the government, leaving the investor's retention at 67 percent. For an investor who began the period with an investment of \$1 million, the net result was a final capital pool of \$11.3 million in the low-cost tax-managed fund, compared to \$6.8 million for the investor in the typical mutual fund.

It is with decidedly mixed emotions that I tell you that the Garland methodology seriously *overstated* the return of the typical fund. It assumed a fund expense ratio of one percent, and ignored fund transaction costs. As I have noted, however, all-in costs today average fully two percent. It also assumed that all capital gains were in fact realized on a long-term basis (28 percent tax), while perhaps one-third of fund gains were taxable at a (then) short-term rate of 36 percent. The study also moderately *understated* the results of the tax-managed index fund, assuming an 0.3 percent expense ratio when 0.2 percent would have been more realistic. But, even giving the benefit of a very large doubt to the typical fund, the impact of taxes and expenses on mutual fund returns is astonishing.

I don't want to focus solely on mutual funds as the villain of the powerful alliance of taxes and expenses, for there are others, of which the increasingly popular hedge fund is an excellent illustration. According to the Institute for Private Investors, 56 percent of its members own hedge funds, which in

turn constitute 13 percent of your current asset allocations (suggesting that those who do own hedge funds maintain an allocation of roughly 25 percent).

For all their new popularity, however, hedge funds must leap two big hurdles to achieve competitive returns for taxable investors. First, it is not atypical for all gains to be realized on a short-term basis, a heavy penalty indeed. Second, advisory fees are inordinately high. While the typical one percent annual fee may not be excessive, it comes hand-in-hand with a euphemistically-described “carried interest” of 20 percent. (This “interest” is, of course, an incentive fee equal to 20 percent of gains, without a symmetrical penalty for losses.) In “The Supplement,” published by your Institute last summer, the hard facts were pointed out: given the impact of taxes and fees, a hedge fund manager earning a gross annual return of 25 percent (no mean accomplishment!) would deliver a net-net return to the client of 10 to 12 percent. Clearly—once again—all that glitters is not gold. Wise investors will ignore the third dimension of return—cost—at their peril.

### **Time—The Fourth Dimension**

Now, I want to move beyond the three *spatial* dimensions of return—length, breadth, and depth, illustrated by return, risk, and cost—to the fourth dimension—time. It was, I believe, Albert Einstein’s General Theory of Relativity that led to the concept of time as the fourth dimension, and it is an equally useful concept in the world of investment return.

In the world of investing, the importance of time in shaping returns has been honored more in theory than in action. We speak of the value of long-term investing, and we say kind words about long-term investors. But when we come to list them, it is hard to name two. (Who would come to mind after Warren Buffett?) In the mutual fund industry, we clearly invest for the short term, with nearly one-half of equity fund portfolios having turnover of more than 100 percent each year. If our marketing policies and fund supermarkets are any indication, we seek short-term investors too. And we get them, for the average shareholder, by turning over his or her equity funds at an average annual rate of 36 percent, holds the funds for less than three years. On the other hand, I suspect that wealthy private investors have the lowest turnover of any large group, and I am hardly above suggesting that may be precisely why they are wealthy in the first place. Experience need not be painful to teach a powerful lesson.

As it must happen, of course, market index strategies have the longest time horizons of all. An all-market index changes only at the glacial pace of the entire market itself, since initial offerings are small in relative weight and firms that vanish, whether by merger or bankruptcy, rarely entail a portfolio transaction. The annual portfolio turnover of an all-market index fund rarely exceeds two percent. That long horizon is surely a significant factor in the formidable relative returns that index funds have provided.

Given Einstein’s role in bringing time to the fore as the fourth dimension of our universe, it is hardly surprising that he is often quoted (perhaps apocryphally) as having described, compound interest as “the greatest mathematical discovery of all time.” And, in our industry, our marketers make the most of it, using compound interest to illustrate the increasing capital value accruing to stocks over time, often comparing equities with fixed interest savings. In a typical long-term (say, 40-year) chart, a mutual fund might show a \$10,000 investment in equities with an assumed 12 percent return, and another line showing savings with an interest return of 5 percent. The savings plan limps along to a final value of \$70,000. But the equity plan soars to \$930,000. The value of time—the fourth dimension of return—and “the magic of compounding” writ large!

However, what is almost *never* shown by the industry is a second kind of chart. It is a rather disturbing one. It presents the same time period, the same 12 percent market return, and the same \$930,000 end result. But a second line compares it with earning a 10 percent return, simply the market return reduced by estimated all-in annual mutual fund expenses of 2 percent. At 10 percent, the line still grows, and nicely, but the capital in the mutual fund grows to only \$450,000—*less than half of the market's return*. It is the mutual fund managers and distributors who have earned (or confiscated) the missing \$480,000. Without putting up one cent of the initial capital, the entrepreneurs have taken as their fees more than half of the reward.

This brute evidence, then, gives rise to a third chart: “the tyranny of compounding.” This chart compares the extra capital (over and above the initial investment) earned at returns of 10 percent and 12 percent. In the first year, the mutual fund grows by \$1,000, or 83 percent of the \$1,200 provided by the market; by the tenth year, it is 75 percent; the 25<sup>th</sup> year, 61 percent; and by the 40<sup>th</sup> year, with capital of \$450,000 versus \$930,000, the fund has provided just 48% of the capital that would have been accumulated in the market. That “cost matters” (a phrase I have used more than once!), and that small differences in compound interest lead to increasing, and finally staggering, differences in capital accumulation—is starkly illustrated, not by the magic, but by the tyranny, of compounding. Surely, time deserves its designation as the fourth dimension of investment return.

### Summing Up

Whether or not we are navigating in a new investment environment, it seems to me that private investors should bear in mind these four basic dimensions of long-term return, applying them to every asset class in which you participate. And never forget that these four dimensions are remarkably interdependent. Reward and risk go hand-in-hand. Cost can have a significant impact on either—or both. And since lengthening duration at once accelerates aggregate rewards, reduces volatility risk, and magnifies the burden of costs, time interacts with all three spatial dimensions.

Provided only that your basic objectives are long-term in nature, awareness of this interdependence will give you a strong advantage in planning the voyage of your own flagship account. Recognize, to be sure, that all investors will face rough seas and high winds during the long voyage, and that today's bright skies, sprightly breezes, and calm oceans won't last forever. Whether a tidal shift is in store for the financial markets remains to be seen. But those of you looking to far horizons, able to accept a bit more short-term risk in the pursuit of enhanced long-term returns, conscious of the destructive power of cost, and able to use time to its highest advantage, can win the battle for investment survival, if only you have the wit and the wisdom to stay the ever-exciting course that lies ahead.