

Long-Duration Trusts and Endowments

It's fecundity that matters.

James P. Garland

Endowment funds and long-duration personal trust funds are different from other institutional funds such as pension funds. Trustees of endowments and long-duration trusts expect to preserve their capital for a very long time; trustees of pension funds expect their capital to be consumed. Trustees of endowments and trusts seek reliable streams of spendable cash; trustees of pension funds (whose spending needs typically lie in the future) seek healthy short- to medium-term total returns.

I explain why endowment and trust fund trustees should evaluate their funds differently from the way that pension fund trustees evaluate theirs—and introduce a new technique for evaluating endowments and trusts.

To some, capital is an asset whose utility lies in its ability to be converted into cash to pay for (say) college educations or a new home. To others, the utility of capital lies in its ability to generate streams of spendable cash on a sustained basis. For the first group, the utility of capital is a function of its price. For the second, it is primarily a function of its ability to provide predictable long-term spendable cash.

The same asset—financial capital—can be employed to satisfy different objectives. As a result, the same asset should be subject to different evaluation standards. To be useful, these standards should relate to the funds' objectives.

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OBJECTIVE OF ENDOWMENTS AND TRUSTS

The primary objective of most endowment funds, and of many long-duration trust funds, is to provide spendable cash for their owners and beneficiaries for a very long time. Given this objective, the most important point to consider in evaluating the health of endowments and trusts is their *fecundity*. Fecund means "fruitful or fertile," and cash withdrawals from a portfolio are effectively its fruit. Fecundity is a measure of the spendable cash that a fund can provide today without unduly threatening its ability to provide similar amounts—adjusted for inflation—in the future.

Consider a simple case: a tax-exempt institution whose need for cash will grow with inflation and whose endowment is invested solely in long-term inflation-indexed Treasury bonds (TIPS) purchased at par and paying a real coupon of C . The fecundity of this endowment is C times the inflation-adjusted par value of the bonds. In the more common case, when capital is invested in a portfolio of stocks and bonds, the fecundity of an endowment fund is its prospective, very long-term, real return.

EVALUATING FECUNDITY

What is the prospective real return of a portfolio of stocks and bonds? The prospective real return of TIPS can be found simply by looking in a newspaper. In theory, the prospective real return of traditional bonds should be higher than the TIPS return to compensate investors for the traditional bonds' higher risk.

Determining the prospective very long-term real return of stocks, however, is a much more difficult matter. Many articles on the subject in the past 15 years share a common theme, namely, that the prospective long-term return equals the current dividend yield plus something.¹

Garland [1989], for example, estimates that future real returns would be 125% of the current dividend yield. Bogle [1995] writes that future returns would be the current dividend yield, plus future dividend growth, plus or minus an adjustment for changing price/earnings ratios. Hertog and Levine [1996] perform simulations on a hypothetical long-term trust whose beneficiary received the dividend yield and the "plus-something" portion of the return was used to pay the trust's capital gains taxes. Arnott and Bernstein [2002] estimate future returns to be the dividend yield plus a fraction of future per capita GDP growth. Levine [2003] suggests that future real returns might be roughly equal to five-eighths of the

S&P 500's normalized earnings yield.

My purpose is not to argue which approach is best, but rather to point out that future real returns seem to lie within a fairly broad but easily defined range, and that just knowing the range can provide valuable insights. I will show that *the fecundity of an equity portfolio*—before allowance for expenses and (if applicable) capital gains taxes—*lies somewhere between the earnings yield and the dividend yield of the portfolio*.

As a practical example, the S&P 500's current dividend yield is about 1.7%, and its earnings yield (i.e., the reciprocal of its price/earnings ratio) is about 4.5%. The fecundity of a \$1 million endowment invested in the S&P 500 appears today to lie somewhere between \$17,000 and \$45,000.

Upper Limit: Earnings

My first proposition is that *the upper limit of the fecundity of stocks is their earnings yield*. Warren Buffett once wrote that "investors as a whole cannot get anything out of their businesses except what the businesses earn" [1999, p. 216]. This suggests that the fecundity of an equity portfolio should be the dollar value of the aggregate earnings of the securities in the portfolio. In percentage terms, the fecundity would appear to be the portfolio's earnings yield.

Buffett's statement is logical and appears to be generally accepted in theory. That is, the owners of a company that earns \$ X can spend only \$ X without harming the company's ability to earn similar inflation-adjusted amounts in the future. Yet history suggests that the earnings yield, rather than being the true measure of fecundity, instead marks at best its upper limit. The true fecundity of a well-diversified stock portfolio has historically been less than its earnings yield.

To see some support for this last assertion, consider a \$100 investment in the S&P composite stock index on the last day of 1949. Assume that the total earnings (cash dividends plus retained earnings) from this investment are spent at the end of each calendar quarter. The results, in real dollars, appear in Exhibit 1.

Because the S&P's price/earnings ratio at the end of 1949 was around 7, its earnings yield was about 14%. Therefore, the first year's spending in Exhibit 1 was \$14, of which approximately \$7 came in the form of cash dividends and the remainder (the retained earnings) from selling part of the original investment.

Exhibit 1 shows how further sales (i.e., further spending of retained earnings) in subsequent years con-

EXHIBIT 1

Spending When All Earnings Consumed

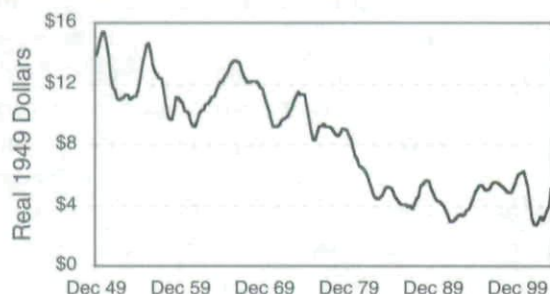
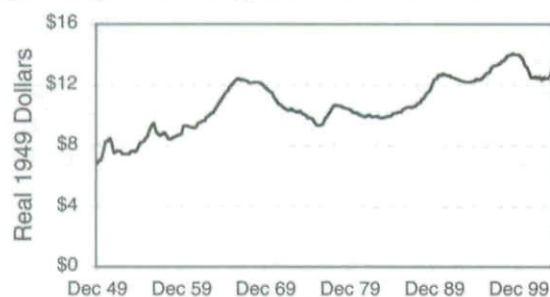


EXHIBIT 2

Spending When Only Dividends Consumed



tinued to eat away at the invested capital. As a result, spending out of the portfolio slowly but inexorably declined to only a fraction of its original amount by the end of 2003. In real terms, annual spending from the 1949 portfolio shrank by two-thirds during this period.

Thus, in retrospect, the true fecundity of this S&P portfolio was less than its earnings yield, and by a significant margin. Theory says that fecundity equals earnings yield; experience says something very different.²

Lower Limit: Dividends

My second proposition is that *the lower limit of the fecundity of stocks is their dividend yield*. Logic suggests that endowment investors should be able to spend something more than the dividends from their equity investments, given that corporate retained earnings, i.e., earnings not paid out as dividends, are used to grow the business. In this instance, history—and the authors I have cited—agree with logic.

Exhibit 2 shows real spending from the same \$100 investment as in Exhibit 1, except that now only dividends are spent. Given that the dividend yield of the S&P in 1950 was around 7%, the first year's spending is about \$7, and over the long term spending slowly grows.

Nominal spending during this period grew from

about \$7 in 1950 to slightly over \$100 in 2003. In real terms, spending grew from \$7 in 1950 to slightly more than \$12 in 2003, which suggests that an even-handed endowment investor could have spent dividends plus some modest fraction of retained earnings.³

In Between

If the fecundity of stocks is less than their current earnings, but more than their current dividends, then obviously true fecundity lies somewhere in between. For the past 50-odd years, true fecundity seems to have been approximately 130% of dividends. That is, an investor could have spent 100% of dividends and liquidated a portion of capital equivalent to 30% of dividends without diminishing the portfolio's ability to generate similar amounts of spendable cash in the future.

Exhibit 3 illustrates this point by showing the results of applying a 130% spending rate to an S&P 500 portfolio beginning in 1950. The 130% spending line (second from the bottom) behaves as desired; i.e., it stays fairly close to its \$1 original value (in real terms) for the entire period. Its near-twin, the dividend line at the bottom, behaves in exactly the same manner. The earnings line (second from the top) is volatile but more or less trendless.

The S&P 500's earnings and dividends grew in real terms during this period, but because spending in this example was set at 130% of dividends, the portfolio's capital was very slowly shrinking. This shrinkage offset the S&P 500's historical real dividend and earnings growth, so the net result was no real earnings or dividend growth.

Note that the real market value of the portfolio increased during the period, even after allowing for the shrinkage of capital. *But increasing market values did not translate into increasing fecundity.*

The market value line at the top in Exhibit 3 is by far the least stable of the four. The amount of capital required to produce \$1 of spending varied widely over the period. In 1950, \$14 of capital would have produced \$1 of spending. By 1965, the capital required to produce the same \$1 had grown to \$42. It shrank to \$16 in 1981, and then ballooned to \$89 at the subsequent bull market peak in 1999.

Fecundity Ratio Chart

Most investors think of spending in percentage terms. To help them, Exhibit 4 shows upper and lower limits for the S&P 500's fecundity ratio—i.e., its earnings

EXHIBIT 3

Spending 130% of Dividends

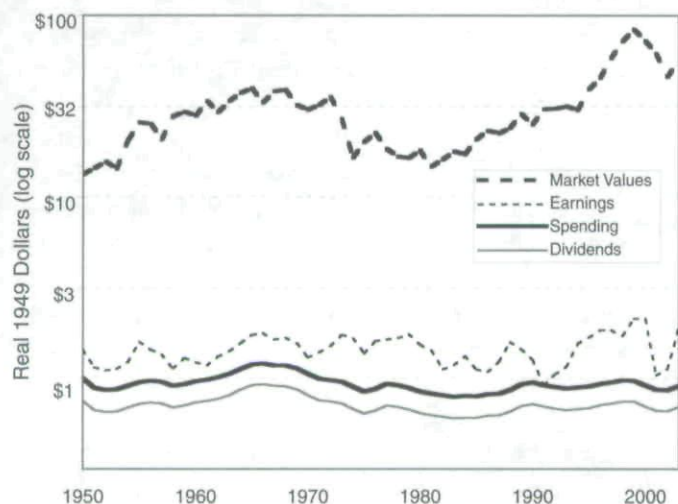
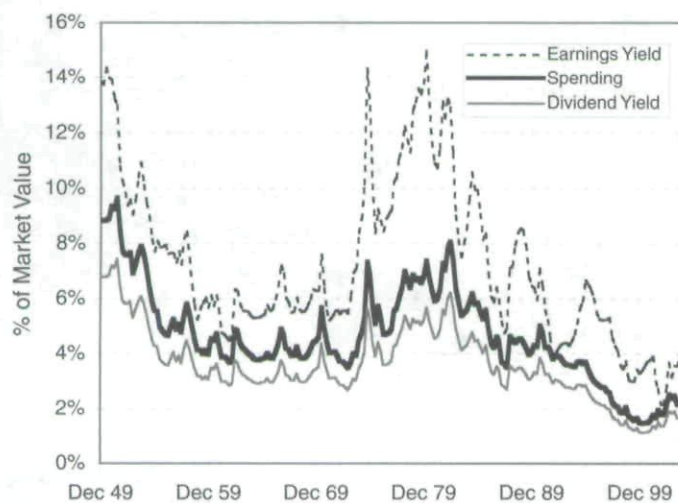


EXHIBIT 4

S&P 500 Fecundity Ratio



and dividend yields—since the end of 1949, calculated quarterly. The limits are shown as a percentage of market values. The fecundity ratio at the end of 1949, for example, lay somewhere between 7% and 14% of the S&P 500's market value. The darkest line in the middle represents the 130% of dividends spending rate that appeared in Exhibit 3.

WHY FECUNDITY IS USEFUL

Overseers of endowments and long-duration trusts are accustomed to focusing on market values. But market values matter in only one respect. Market values determine scale—that is, a \$1 million equity portfolio obviously will

have only half the fecundity of a \$2 million equity portfolio. But market values don't determine fecundity itself, which is a function of earnings and dividends. A portfolio that's worth \$1 million this month and \$800,000 next month will have the same fecundity on each occasion, provided there's been no change to its holdings and to their underlying earnings and dividends.

Overseers of endowments and trusts should focus their attention on fecundity. Such a focus can provide insights such as the following.

5% Spending is Too Much Today

First, the belief that endowments and trusts can spend 5% of the value of their assets in perpetuity without harming future beneficiaries is so endemic that it seems to be hard-wired. Yet Exhibit 4 shows that 5% simply hasn't been available during the past several years—and that's true even under the most optimistic spending assumption that fecundity equals earnings yield.

A few endowments and personal trusts limit their spending to only 4% of assets, but that hasn't been available of late either. What about 3%? Perhaps, but only perhaps, given that most endowments hold bonds, which normally would reduce current fecundity below the already low levels shown in Exhibit 4.

Bonds reduce fecundity in normal circumstances because bonds generally offer lower future returns than stocks. The ranges shown in Exhibit 4 apply to an all-equity portfolio and therefore presumably overstate the fecundity of a balanced stock and bond portfolio.⁴

Because 5% spending is so common, and because past earnings yields have often been higher—sometimes much higher—than 5%, many readers may understandably resist the notion that 5% spending is too much. There are two responses to this complaint. First, spending 5% is too much *today*, due to very high stock prices, but 5% spending has been suitable at various times in the past and may again be suitable someday in the future.

Second, a significant fraction of retained earnings has been lost to investors—due apparently to poor investments, empire building, shareholder dilution, and perhaps other causes—and as a result has not been available to spend. Exhibit 1 shows that the earnings yield has not been a good measure of fecundity.

Spending Based on Market Values is Inherently Unstable

Most endowments and trusts desire stable spending, but market values are anything but stable. Why, then, do investors use market values to determine spending?

While a few institutions base spending on market values and then compensate for changing prices by varying the percentage spending rate, the far more common practice is to set a fixed percentage of market values (e.g., the ubiquitous 5%), and then to stick with it through thick and thin. But fixed percentage-of-market-value spending rates will produce "unfixed" spending, in spite of attempts to smooth price volatility via averaging.

For investors who want stable spending, a rule based primarily on dividends would seem best, because (as shown in Exhibit 3) dividends are more stable than earnings or market values. A second option would be to base spending on earnings, although five-year or perhaps even ten-year averaging may be necessary to smooth the hills and valleys of earnings. But no amount of averaging will smooth market values.

Dividends and (to a lesser extent) earnings have been and probably will continue to be more stable than market values. That's why dividends and earnings are a sounder basis for fecundity.

Preserving Real Principal is a Poor Test of Evenhandedness

An important issue for endowments and long-duration trusts is intergenerational evenhandedness, i.e., not favoring one generation at another's expense. Over time the common standard for evaluating evenhandedness has changed. Originally trustees compared beginning and ending nominal market values: The value of our endowment was \$2 million in 1982; it is \$2 million today, so we have been evenhanded. Today trustees perform this exercise using real rather than nominal market values: The value of our endowment was \$2 million in 1982; it is \$4 million today; the cost of living doubled during this period, so we have succeeded. Yet this newer method is still faulty.

This preserving-real-market-value test is appropriate only in the unusual case when capital is first used in an endowment mode (i.e., to generate spendable cash) for a period, and then used in a cash-out mode (e.g., to purchase a building) at the end. But in the much more common case when capital is used in the endowment mode more or less in perpetuity, the only logical way to mea-

sure evenhandedness is on endowment terms, that is, by comparing the fecundity of the capital at the start of the period with its fecundity at the end.

Suppose an endowment's market value was \$10 million at the end of 1979. Suppose further that, at the end of 2003, its market value was \$24 million, which in real terms is the same as in 1979. What was the fecundity of that endowment in 1979, and what is its fecundity today?

Only if today's fecundity—in real-dollar terms—is the same as in 1979 can the endowment's overseers claim to have been evenhanded. For endowments and long-duration trusts, the true test of intergenerational evenhandedness is preservation of fecundity, not preservation of market values.

Here is an example. According to the data underlying Exhibit 4, the fecundity of an endowment portfolio at the end of 1979 was somewhere between 5.23% and 13.77% of its market value, these being the trailing dividend and earnings yields at the time. Thus the fecundity of a \$10 million all-equity endowment in 1979 would have been somewhere between \$523,000 and \$1,377,000.

If the endowment had maintained its real market value through the end of 2003, it would then be worth \$24 million, and its fecundity (based again on trailing dividend and earnings yields) would be between \$375,000 and \$1,052,000. But these last two numbers are current-dollar numbers—for comparison to 1979 dollars, they have to be divided by 2.4, the change in the consumer price index. Thus, in 1979 dollars the fecundity of a \$24 million endowment in 2003 would be between \$156,250 and \$438,333.

These results appear in Exhibit 5. Using as a single reference point the 130% of dividends numbers shown in bold print in the last line, in inflation-adjusted dollars the fecundity of this portfolio today is less than one-third of what it had been in 1979. Today's income beneficiaries are much worse off, even though the endowment's market value kept pace with inflation.

How much capital would one need in 2003 to provide the same fecundity, in real dollars, as in 1979? According again to the 130% of dividends numbers, the answer is \$80 million. At the end of 2003, an \$80 million endowment would have had approximately the same fecundity, in real dollars, that a \$10 million endowment had in 1979.⁵

Evaluating evenhandedness by this method is straightforward, requiring only the fecundity data underlying Exhibit 4 and the CPI. Both appear in the appendix with columns of precalculated numbers for various vintage years since 1974.

EXHIBIT 5

Market Values and Fecundity

	In 1979	In 2003	
		(2003 \$\$)	(1979 \$\$)
Market Value	\$10,000,000	\$24,000,000	\$10,000,000
Min. Fecundity (dividends)	\$523,000	\$375,000	\$156,250
Max. Fecundity (earnings)	\$1,377,000	\$1,052,000	\$438,333
130% of Min. Fecundity	\$679,900	\$487,500	\$203,125

The current near-universal method of demonstrating intergenerational evenhandedness is to show that the real market value of a portfolio has been preserved. But market values don't matter to endowments and long-duration trusts; fecundity matters instead. Over the past 20-plus years, market values have ballooned, but fecundity has not. My example shows that it takes eight times as many dollars in 2003 to provide the same fecundity as in 1979.

With sharply rising stock prices, it takes much more money to buy an endowment-like spending stream today than it would have taken in 1979. That's the downside of a bull market.

Fecundity Investors Have Different Risks

For those seeking endowment-like streams of spendable cash (stable streams that keep pace with inflation), lower-risk investments are ones likely to provide these cash streams, while higher-risk investments are everything else.

The lowest-risk assets for endowments and tax-exempt long-duration trusts are the Treasury's inflation protected securities—TIPS—followed by real estate and traditional equities. All three of these asset classes, under normal conditions, provide growing cash flows and growing principal values. Higher-risk assets would be ones with uncertain or stagnant cash flows and principal values, such as cash-equivalents and traditional bonds. Note how cash—a lower-risk asset class for pensions—is a higher-risk asset for endowments, while equities—a higher-risk asset for pensions—are a lower-risk asset for endowments.

Among non-traditional asset classes, private equity and timberland would qualify as lower risk, while hedge funds would qualify as higher risk.

Fecundity is a Fuzzy Concept

As described here, fecundity is a fuzzy concept. It lies somewhere between earnings and dividends, and perhaps (as it seems in the past) near 130% of dividends. But fecundity's fuzziness doesn't nullify its usefulness.

Endowment investors who hold shares of publicly held corporations can determine the market values of their assets to the penny—but this information provides very little clue as to their assets' fecundity. The same investors can determine their funds' fecundity only in an approximate sense, but this information is far more useful.

While fecundity is fuzzy, it is important to long-term investors; while market values are precise, they are not so important.

Fecundity Points to True Investment Risks

An understanding that fecundity is the critical metric for endowment funds leads to another insight. Endowment investment risk isn't a function of betas or Sharpe ratios or value at risk, although these measures may be useful at a secondary level. Instead, the primary risk facing endowments is fecundity risk, i.e., the risk of a prolonged decline in the earnings of and dividends from the corporations in which they're invested. The futures of endowments and very long-duration trusts are inescapably bound to the futures of the American and world economies.

Rather than worry about market values, endowment-like investors should focus on:

- *The quantity and quality of reported earnings.* Earnings are by nature estimates, but recently they've sometimes seemed more like guesses. Are current earnings overstated because some expenses such as option-based compensation aren't accounted for properly? Are current earnings overstated due to inflated estimates of future pension plan returns? Are earnings overstated because of poor acquisitions that have yet to be marked down?
- *The true value of stock buy-backs to shareholders.* Are stock buy-backs really equivalent to dividend payments on a dollar-for-dollar basis? Isn't a buy-back at 50 times earnings less beneficial than a buy-back at 5 times earnings?
- *Dividend payout rates.* In theory, low aggregate dividend payout rates signal faster future earnings growth, because more profits are retained by corporations for new investments. In fact, however, just the opposite seems to be true. Arnott and Asness [2003] find that low payout rates tend to be followed by slower earnings growth, while high payout rates tend to be followed by faster earnings growth.

- *Corporations' use of retained earnings.* The points above, and the fact that fecundity equals dividends plus only a fraction of retained earnings, both suggest that a dollar of retained earnings is less valuable to investors than a dollar of dividends. To what extent do managements and employees use the retained earnings of their corporations for their own benefit rather than for their shareholders' benefit? To what extent are retained earnings just wasted? To what extent will tomorrow's earnings power be based on intellectual rather than financial capital—i.e., to what extent is earnings retention becoming unnecessary?
- *Good laws and good social institutions* to provide safeguards for personal and property rights and to provide a foundation for future economic growth.

I am puzzled that overseers of endowments and trusts spend so much time on minor matters, such as efforts to beat benchmarks, and so little time on more important matters, such as the health of economies and corporations. Beating a benchmark is icing on the cake; what's far more important is the size of the cake.

Fecundity Can Provide Investment Insights

While there seems not to be any research on the subject, I think the fecundity of a well-diversified REIT portfolio might be 80% to 100% of that portfolio's dividend yield.⁶ At the end of 1999, the dividend yield of the National Association of Real Estate Investment Trusts Index was 8.7%. At that time the fecundity of the S&P 500 (from the data underlying Exhibit 4) was somewhere between 1.1% and 3.3%.

Suppose an endowment fund is contemplating shifting some of its capital among three asset classes as follows:

Asset Class	Fecundity	Basis for Fecundity
REITs	7.0% to 8.7%	80%-100% of current yield
Large-cap stocks	1.1% to 3.3%	S&P 500 div/earn yields
Internet stocks	Zero	No dividends and no earnings

What should a rational endowment investor do in this situation?

FECUNDITY IS BEFORE EXPENSES

If an endowed institution has a fecundity of, say, \$F per year, that doesn't mean that it can spend \$F per year

on its programs. Instead, \$F per year is available for a variety of purposes, and program spending is only one.

There's an unfortunate hierarchy in the way a portfolio's fecundity pie gets divided. The first claim on the pie goes—in the case of taxable trusts and a few foundations—to the IRS. Second claim goes to those who administer, hold, and manage the portfolio. The owner gets only what's left.

Portfolios can have hidden costs as well. The graphs in this article show the past fecundity of the S&P 500, using that index as a proxy for the American stock market as a whole. To the extent that a particular investor's equity returns have differed from those of the S&P 500, the excess or deficit drops to the bottom line. For example, the fecundity of an endowment whose equity returns consistently lag the S&P 500 by 75 basis points per year would be 75 bp lower than shown in Exhibit 4.

The formulas for determining spending for real-life portfolios are straightforward. The first formula needs no explanation. The second breaks the fecundity of assets term into its components.

$$\begin{aligned}\text{Spending} &= \text{Fecundity of Assets} - \text{Investment Expenses} - \text{Taxes} \\ \text{Fecundity of Assets} &= \text{Fecundity of Stocks} \pm \text{Adjustment for Fecundity of Other Portfolio Assets} \pm \text{Adjustment for Actual Returns versus Asset Class Returns}\end{aligned}$$

For the fecundity of stocks term on the right-hand side of the second equation, I use the earnings and dividend yield of the S&P 500. The second term—an adjustment for other assets—compensates for inclusion of assets such as bonds (whose presence should reduce overall fecundity because of their lower prospective returns), or other assets such as foreign stocks and private equity (whose inclusion might increase fecundity if the expected returns from these asset classes are greater than those expected from the S&P 500). The final term is an adjustment for the actual returns received from these investments versus either their corresponding asset class returns or their expected returns.

For the record, some institutions' spending is greater than their fecundity. Such behavior is perfectly proper at institutions where new capital is coming in the back door (such as through fundraising) and at institutions with finite lives. I address very long-lived endowed institutions and trusts where no new capital is forthcoming.

UNRESOLVED ISSUES

Several issues deserve further attention.

Precise Estimate of Fecundity

The first unresolved issue is a more precise estimate of fecundity that would replace the broad ranges offered here, although the ranges are useful. For example, they throw cold water on the presumption that 5% spending today is evenhanded, because even the highest current theoretical spending rate (i.e., the earnings yield) is lower than 5%. The 130% of dividends number is useful for evaluating past evenhandedness—but this number is a backward-looking one.

A forward-looking estimate of today's true fecundity would be useful. It's time we did more research in this regard.

Disappearing Earnings

The most interesting question may be why investors can't spend what their corporations earn; that is, why fecundity is below earnings yield. Where do these disappearing earnings go?

In 2003 the S&P 500's aggregate earnings were about \$450 billion, and its aggregate dividends were about \$160 billion. Suppose that the true fecundity of an endowment today lies approximately midway between its earnings and dividends. The midpoint between \$450 billion and \$160 billion is \$305 billion. If this rough estimate is correct, then approximately \$145 billion (\$450 billion less \$305 billion) is slipping through investors' fingers every year. Yet only a few individuals seem to have noticed this phenomenon, and only the same few seem to care!⁷

The fecundity ranges of international (i.e., non-American) equity portfolios should be easy to calculate, using dividend and earnings yields. But does the disappearing earnings problem exist outside the United States? If so, is it of the same magnitude? These questions deserve examination.

Fecundity of Non-Traditional Assets

Some sophisticated endowments and trusts have focused recently on so-called alternative asset classes such as real estate, commodities, hedge funds, private equity, and venture capital. Real estate is a relatively simple matter, since it typically offers earnings and—at least in the

case of publicly traded REITs—dividends. There is no way, however, to evaluate the fecundity of investments that lack underlying earnings or stable dividends, such as commodity funds, hedge funds, and venture capital.

Fortunately, non-traditional assets seem to be used for the most part by very well-endowed institutions that have successful capital-raising activities on the side. As an example, leading universities should care less about fecundity than would (say) a typical personal trust. These universities have some flexibility in setting spending rates because they receive new capital via annual gifts, bequests, and capital campaigns.

Non-traditional investments can be risky, though, even if their returns appear to be satisfactory. Recall the earlier example of an endowment that was worth \$10 million in 1979. Its minimum fecundity at the time, based on dividends, was slightly over \$500,000 or 5% of its market value.

Suppose the trustees of that endowment choose to liquidate its traditional equity investments and invest solely in non-traditional assets such as hedge funds. Presumably these trustees would seek a 5% net real return. Suppose now that the endowment consistently meets that goal, so that its trustees are able to spend 5% each year and the endowment's market value grows in line with inflation. Then by the end of 2003 the endowment would be worth 2.4 times its original value, or \$24 million, and would be throwing off \$1.2 million of spendable income.

Now suppose that the trustees decide to close down their hedge fund investments and return to mainstream investments, i.e., common stocks. They invest the \$24 million in the S&P 500 and find that the fecundity of this capital is only a fraction of \$1.2 million. Because the market value of the S&P 500 rose much faster than inflation during this period, an investor who jumped ship in 1979 would not be able to afford to reboard in 2003.⁸

Value of Stock Buy-Backs

In discussing corporate behavior, all sides seem to have given a bye to the value of stock buy-backs. We seem to accept the notion that spending \$X on stock buy-backs is the exact equivalent to distributing \$X as dividends. This equivalence is patently false.

Using a corporation's cash to buy back stock when it sells for less than fair value (e.g., for four times earnings) is very likely a good use of shareholders' money, and in this case \$X of buy-backs may do the remaining shareholders more good than \$X of dividends. Yet using cash

to buy back stock that is selling at much more than fair value (e.g., for 40 times earnings) is very likely a poor use of shareholders' money, and \$X spent this way is probably much less beneficial to shareholders than just \$X in dividends.

Most people seem to be ignoring this issue—but it matters. Done well, buy-backs increase fecundity. But done poorly, they just toss money down a sinkhole. And buy-backs to cover option grants have zero fecundity. An assumption that every dollar of buy-backs is well spent is naive and, given the huge dollars involved, not acceptable.

CONCLUSION

"Most investors . . . are concerned not with the level of wealth for its own sake, but with the standard of living that their wealth can support. In other words . . . they derive utility from consumption rather than wealth" (Campbell and Viceira [2002, p. 37]).

The utility of capital depends on the time horizon over which it will be consumed. For capital that will be consumed today, utility is a function of its current market value. For capital that will be consumed over a lifetime (such as in a personal retirement plan), utility is a function of future total returns. For capital that will never be consumed, utility is strictly a function of fecundity. This last point is one that overseers of endowments and long-duration trusts need to understand.

The concept of fecundity is actually not new. It's just been forgotten—at least in the endowment and trust community. In England, 200 years ago, it was not uncommon to measure wealth in terms of the income it produced rather than its market value. Today many real estate investors pay attention to cash-on-cash returns, a concept closely related to fecundity. But in the investment community, which is dominated by retirement funds awash in transactional data, market values have become the universal denominator of wealth.

Many trustees have lost their focus. They're monitoring market values when they should be monitoring fecundity. Once one focuses on fecundity, several points become clear.

The characteristic 5% spending rate is too high today for tax-exempt institutions that are trying to be evenhanded. Basing spending on market values produces undesirable volatility. The traditional method of determining evenhandedness is wrong. The primary risks to endowment investors are related to the health of the economies in which they're invested.

The primary points that investors should focus on are not the search for alpha, or arguments over allocations to small-cap stocks, or which hedge funds to buy. The primary determinant of fecundity is economic health—and it's something to which investors pay little attention.

Note that market values appear in only one of my graphs. For endowment and trust investors whose primary objective is the production of a very-long term income stream, market values matter very little. Fecundity matters instead.

APPENDIX

Real Fecundity

SPRING 2005

	Unadjusted Fecundity Range for the S&P 500			CPI	130% of Dividend Yield, Adjusted for Subsequent Increases in CPI																			
	Earn Yield (maximum)	Div. Yield (minimum)	130% of Div. Yield		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
1974	13.0%	6.83%	5.25%	51.9	6.83%																			
1975	8.83%	5.30%	4.08%	55.5	4.96%	5.30%																		
1976	9.22%	4.90%	3.77%	58.2	4.37%	4.67%	4.90%																	
1977	11.5%	6.38%	4.91%	62.1	5.34%	5.71%	5.98%	6.38%																
1978	12.8%	6.86%	5.28%	67.7	5.26%	5.62%	5.90%	6.29%	6.86%															
1979	13.8%	6.80%	5.23%	76.7	4.60%	4.92%	5.16%	5.51%	6.01%	6.80%														
1980	10.9%	5.90%	4.54%	86.3	3.55%	3.79%	3.98%	4.24%	4.63%	5.24%	5.90%													
1981	12.5%	7.03%	5.41%	94.0	3.88%	4.15%	4.35%	4.65%	5.07%	5.74%	6.46%	7.03%												
1982	8.99%	6.35%	4.88%	97.6	3.38%	3.61%	3.79%	4.04%	4.40%	4.99%	5.62%	6.12%	6.35%											
1983	8.51%	5.59%	4.30%	101.3	2.86%	3.06%	3.21%	3.43%	3.73%	4.23%	4.76%	5.19%	5.38%	5.59%										
1984	9.95%	5.85%	4.50%	105.3	2.88%	3.09%	3.24%	3.45%	3.76%	4.26%	4.80%	5.23%	5.43%	5.63%	5.85%									
1985	6.91%	4.86%	3.74%	109.3	2.31%	2.47%	2.59%	2.76%	3.01%	3.41%	3.84%	4.18%	4.34%	4.51%	4.68%	4.86%								
1986	5.96%	4.44%	3.42%	110.5	2.09%	2.23%	2.34%	2.50%	2.72%	3.09%	3.47%	3.78%	3.93%	4.07%	4.24%	4.40%	4.44%							
1987	7.08%	4.64%	3.57%	115.4	2.08%	2.23%	2.34%	2.49%	2.72%	3.08%	3.47%	3.78%	3.92%	4.07%	4.23%	4.39%	4.44%	4.64%						
1988	8.55%	4.55%	3.50%	120.5	1.96%	2.10%	2.20%	2.35%	2.56%	2.90%	3.26%	3.55%	3.69%	3.83%	3.98%	4.13%	4.18%	4.36%	4.55%					
1989	6.47%	4.06%	3.13%	126.1	1.67%	1.79%	1.88%	2.00%	2.18%	2.47%	2.78%	3.03%	3.15%	3.27%	3.39%	3.52%	3.56%	3.72%	3.88%	4.06%				
1990	6.46%	4.76%	3.66%	133.8	1.85%	1.98%	2.07%	2.21%	2.41%	2.73%	3.07%	3.35%	3.47%	3.61%	3.75%	3.89%	3.93%	4.11%	4.29%	4.49%	4.76%			
1991	3.83%	3.80%	2.93%	137.9	1.43%	1.53%	1.60%	1.71%	1.87%	2.11%	2.38%	2.59%	2.69%	2.79%	2.90%	3.01%	3.05%	3.18%	3.32%	3.48%	3.69%	3.80%		
1992	4.38%	3.69%	2.84%	141.9	1.35%	1.44%	1.51%	1.62%	1.76%	2.00%	2.25%	2.45%	2.54%	2.64%	2.74%	2.85%	2.88%	3.00%	3.14%	3.28%	3.48%	3.59%	3.69%	
1993	4.69%	3.51%	2.70%	145.8	1.25%	1.33%	1.40%	1.49%	1.63%	1.84%	2.08%	2.26%	2.35%	2.44%	2.53%	2.63%	2.66%	2.78%	2.90%	3.03%	3.22%	3.32%	3.41%	
1994	6.66%	3.73%	2.87%	149.7	1.29%	1.38%	1.45%	1.55%	1.69%	1.91%	2.15%	2.34%	2.43%	2.52%	2.62%	2.72%	2.75%	2.88%	3.00%	3.14%	3.33%	3.44%	3.54%	
1995	5.51%	2.91%	2.24%	153.5	0.98%	1.05%	1.10%	1.18%	1.28%	1.45%	1.64%	1.78%	1.85%	1.92%	2.00%	2.07%	2.10%	2.19%	2.28%	2.39%	2.54%	2.61%	2.69%	
1996	5.23%	2.61%	2.01%	158.6	0.86%	0.92%	0.96%	1.02%	1.12%	1.26%	1.42%	1.55%	1.61%	1.67%	1.74%	1.80%	1.82%	1.90%	1.99%	2.08%	2.21%	2.27%	2.34%	
1997	4.09%	2.08%	1.60%	161.3	0.67%	0.71%	0.75%	0.80%	0.87%	0.99%	1.11%	1.21%	1.26%	1.30%	1.35%	1.41%	1.42%	1.48%	1.55%	1.62%	1.72%	1.77%	1.83%	
1998	3.07%	1.71%	1.32%	163.9	0.54%	0.58%	0.61%	0.65%	0.71%	0.80%	0.90%	0.98%	1.02%	1.06%	1.10%	1.14%	1.16%	1.21%	1.26%	1.32%	1.40%	1.44%	1.48%	
1999	3.28%	1.48%	1.14%	168.3	0.46%	0.49%	0.51%	0.54%	0.59%	0.67%	0.76%	0.82%	0.86%	0.89%	0.92%	0.96%	0.97%	1.01%	1.06%	1.11%	1.17%	1.21%	1.25%	
2000	3.79%	1.60%	1.23%	174.0	0.48%	0.51%	0.54%	0.57%	0.62%	0.71%	0.79%	0.87%	0.90%	0.93%	0.97%	1.01%	1.02%	1.06%	1.11%	1.16%	1.23%	1.27%	1.31%	
2001	2.15%	1.78%	1.37%	176.7	0.52%	0.56%	0.59%	0.63%	0.68%	0.77%	0.87%	0.95%	0.98%	1.02%	1.06%	1.10%	1.11%	1.16%	1.22%	1.27%	1.35%	1.39%	1.43%	
2002	3.17%	1.83%	1.39%	180.9	0.68%	0.73%	0.76%	0.82%	0.89%	1.01%	1.13%	1.23%	1.28%	1.33%	1.38%	1.43%	1.45%	1.51%	1.58%	1.66%	1.76%	1.81%	1.86%	
2003	4.38%	2.03%	1.56%	184.3	0.57%	0.61%	0.64%	0.68%	0.75%	0.85%	0.95%	1.04%	1.08%	1.12%	1.16%	1.21%	1.22%	1.27%	1.33%	1.39%	1.48%	1.52%	1.56%	

To compare the fecundity of a fund at the end of (say) 1976 with its fecundity at the end of (say) 1995, start with the 1976 column. Multiply the fund's 1976 ending market value by percentage in the table—this is the fund's 1976 approximate fecundity, in 1976 dollars. Then multiply its 1995 ending market value by the 1995 percentage in the same column—this is its 1995 fecundity, in 1976 dollars.

Sources: Standard & Poor's; Bureau of Labor Statistics.

ENDNOTES

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¹This idea dates back at least to the Gordon [1962] dividend growth model [1962], which in one form states that expected future returns from stocks equal their current dividend yield plus future dividend growth.

²Arnott and Bernstein [2002] may be the first to have spotted this "earnings yield shortfall"—i.e., the fact that investors' returns have been lower than their investments' earnings yields. The shortfall seems to have been present since at least the late 1800s.

³Spending dividends plus a portion of retained earnings would have worked during the modern period (i.e., since 1950), when dividend payout rates typically have been in the 40%–60% range. In private communication, Peter Bernstein points out that, in earlier times when payout rates were much higher, an evenhanded investor might have been able to spend only dividends, or perhaps even slightly less than dividends. That's the situation today with REITs.

⁴When we calculate the fecundity of a portfolio including bonds, the numbers applicable to an all-equity portfolio should be reduced to compensate for the presence of bonds. For example, suppose an endowment is 33% invested in bonds, and suppose the trustee of this endowment believes that the future equity risk premium would be 3%; i.e., that bonds would provide 3% lower annual returns than equities. Here bonds would reduce the overall fecundity of the portfolio by 33% times 3% or by 1%. Bonds may still be a useful diversifier in most if not all endowment funds.

To evaluate evenhandedness, if a particular portfolio's bond weighting in the past were substantially similar to its weighting today, no adjustment may be necessary. Whatever "fecundity drag" the bonds caused in the past should be similar to the drag they cause in the present.

⁵That's the 1979 fecundity (\$679,900) divided by the inflation-adjusted 2003 fecundity (\$203,125), all times the 2003 market value (\$24 million).

⁶REITs sometimes distribute more than 100% of their earnings. This is one reason the fecundity of a REIT portfolio might be below its distributions.

⁷Among the few are Robert Arnott, Clifford Asness, and Peter Bernstein. Two apparent causes of disappearing earnings seem to be shareholder dilution, e.g., through the issuance of stock options, and poor investments (sometimes characterized as empire building). See Arnott and Bernstein [2002] and Arnott and Asness [2003].

⁸The actual fecundity range for a \$24 million portfolio at the end of 2003, as I noted earlier, would be \$375,000 to \$1,052,000. The 130%-of-dividends fecundity would be \$487,500.

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