Economics and Portfolio Strategy

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This issue's guest author, Jim Garland, manages a family investment company in Ohio. While his piece addresses spending for endowment and trust funds, it is relevant for other long-duration investment portfolios as well. A longer version of this piece has been submitted to an investment journal.

THE FECUNDITY OF ENDOWMENTS AND LONG-DURATION TRUSTS

by James P. Garland

Rather than focusing on market values, overseers of endowments and long-duration trusts should focus on the extent to which cash can be withdrawn from their funds to meet current spending needs without negatively impacting future withdrawals to meet future spending needs. Cash withdrawals can come from dividends, interest, portfolio asset sales, or some combination of all three. We use the term *fecundity* here to refer to a portfolio's long-term ability to generate spendable cash for its owner, because fecund means "fruitful or fertile," and cash withdrawals from a portfolio are effectively its fruit. Since the ultimate objective of all investment portfolios is to provide spendable cash over some period peculiar to the owner's particular circumstances, paying attention to the fecundity of long-duration portfolios would seem to make imminent good sense. This paper explains how to determine the fecundity of a typical endowment or long-duration trust fund.

Endowments and long-duration trusts 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 typically expect their capital to be consumed. Trustees of endowments and trusts seek reliable streams of spendable cash; trustees of pension funds seek healthy short- to medium-term total returns. Endowment and trust fund trustees should evaluate their funds differently from the way that pension fund trustees evaluate theirs.

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 group, the utility of capital is a function of its ability to provide predictable long-term spendable cash, i.e., its fecundity. The same asset — financial capital — can satisfy different objectives and, for that reason, the same asset should be subject to different evaluation standards. To be useful, these standards should relate back to the respective funds' objectives.

The Objective of Endowments & 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.

Consider a tax-exempt endowed institution whose need for cash is expected to 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, where capital is invested in a portfolio of stocks and bonds, the fecundity of the endowment fund, before expenses, is its prospective very long-term *real* return.

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

Determining the prospective long-term real return from stocks, however, is a much more difficult matter. Many papers written on the subject share a common theme, namely that the prospective return equals the current dividend yield plus something. The purpose of this paper is not to make a specific projection, but rather to point out that future real returns seem to lie within an easily defined range, and that just knowing the range can provide valuable insights. This paper will demonstrate that *the fecundity of an equity portfolio* — before expenses and (if applicable) 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 P/E ratio) is about 4.5%. Thus the fecundity of a $1 million endowment invested in the S&P 500 today lies somewhere between $17,000 and $45,000.

Our 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."[1] This suggests that the fecundity of an equity portfolio would be the dollar value of the aggregate earnings of the securities in the portfolio. In percentage terms, the fecundity would be the portfolio's earnings yield.

Buffett's statement is logical and widely accepted, i.e., the owners of a company that earns $X can only spend $X without harming the company's ability to earn similar 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 diversified stock portfolio has historically been *less* than its earnings yield.

As support for this last assertion, assume a $100 investment in the S&P Composite Stock Index on the last day of 1949. Assume further that the total earnings (i.e., cash dividends plus retained earnings) from this investment are spent at the end of each calendar quarter. The results, in constant real dollars, appear in Figure A on the next page.

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[1] "Mr. Buffett on the Stock Market," *Fortune*, November 22, 1999.

The S&P's price/earnings ratio at the end of 1949 was around 7, which means that its earnings yield was about 14%. Therefore, the first year's spending in Figure A was $14, of which roughly $7 came in the form of cash dividends and the remainder (the retained earnings) came from selling part of the original investment. Further sales (further spending of retained earnings) continued to eat away at the invested capital. As a result, spending out of the portfolio slowly but inexorably declined to the point where it was only a fraction of its original amount by the end of 2003. In real terms, annual spending from the portfolio shrank by two-thirds during this period. Thus the true fecundity of this portfolio was less than its earnings yield, and by a significant margin. Theory says that fecundity equals earnings yield; experience says something very different.

Figure A: Real Spending
When All Earnings Consumed

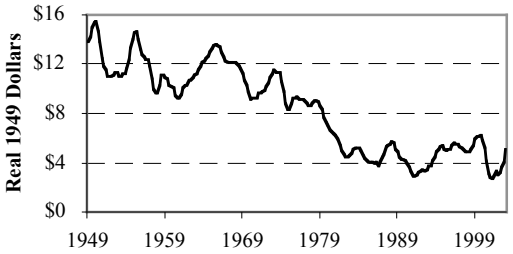
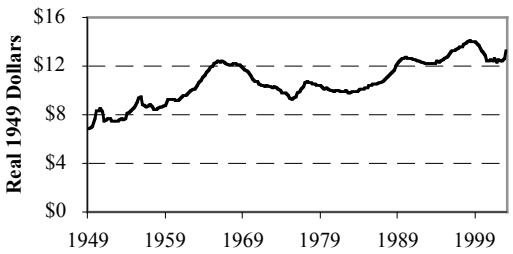


Figure B: Real Spending
When Only Dividends Consumed

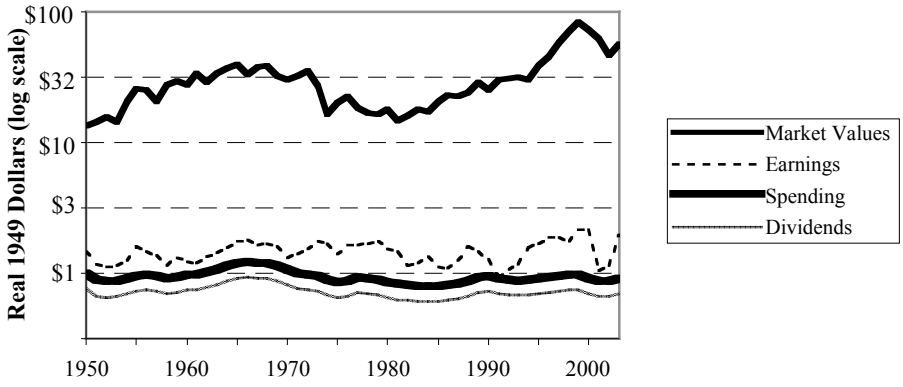


Our second proposition is that *the lower limit of the fecundity of stocks is their dividend yield*. Logic suggests that endowment investors should be able to spend more than the dividends they receive from their equity investments, given that corporate retained earnings, i.e., earnings not paid out as dividends, are supposedly used to grow the business. In this instance history agrees with logic. Figure B shows real spending from the same $100 investment as in Figure A, except here 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. Figure B shows that real spending grew from $7 in 1950 to more than $12 in 2003, which suggests that an evenhanded endowment investor could have spent dividends plus some modest fraction of retained earnings.

If the fecundity of stocks is less than their current earnings, but more than their current dividends, then true fecundity lies somewhere in between. For illustration we shall plot a curve reflecting a spending rate of 130% of dividends, i.e., each year we spend 100% of dividends and liquidate a portion of capital equivalent to 30% of dividends. Figure C on the next page shows the results of applying this rule to an S&P 500 portfolio beginning in 1950. The real spending line (second from the bottom) behaves as desired, i.e., it stays fairly close to its $1 original value for the entire 53-year period. Its near-twin, the dividend line at the bottom, behaves in the same manner. The earnings line (second from the top) is volatile but more or less trendless. S&P 500 earnings and dividends grew in real terms during this period, but because spending has been set at 130% of dividends, the portfolio's capital is very slowly shrinking. The shrinkage almost exactly offsets the S&P 500's historical real dividend and earnings growth, so here the result is no real growth. (Note that the real market

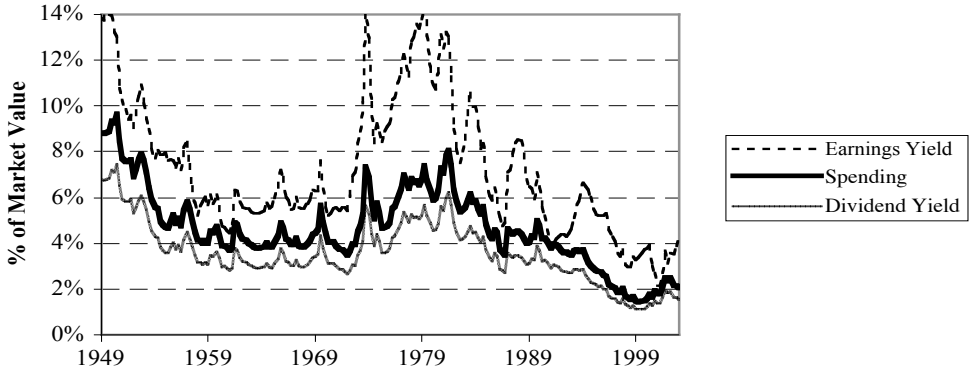
value of the S&P 500 increased, even after allowing for this shrinkage of capital. *But increasing market values do not translate into increasing fecundity*.) The market value line at the top is by far the least stable of the four. The amount of capital required to produce $1 of spending varies widely. In 1950, $14 of capital would have produced the roughly $1 of spending shown in the graph. 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.

Figure C: Fecundity & Market Values



Most investors think of spending in percentage terms. To help them, Figure D shows upper and lower limits for the S&P 500's fecundity ratio — i.e., its earnings and dividend yield — since the end of 1949, and calculated quarterly. The limits are shown as a percentage of market values, e.g., the true fecundity ratio at the end of 1949 lay somewhere between 7% and 14% of the S&P 500's market value. The solid line in the middle represents the 130% of dividends spending rate that appeared in Figure C.

Figure D: S&P 500 Fecundity Ratio



Why Fecundity Is Useful

Overseers of endowments and long-duration trusts are accustomed to focusing on market values. But market values matter only in one respect. Market values determine scale — i.e., a $1 million portfolio obviously will have only half the fecundity of a $2 million portfolio. But *market values don't determine fecundity itself, which is a function of earnings and dividends*. A portfolio that's worth $1 million today and $800 thousand next month will have the same fecundity on each occasion, provided that its holdings — and their underlying earnings and dividends — haven't changed. 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 ubiquitous that it seems to be hardwired in the brain. Yet Figure D shows that 5% simply hasn't been available during the past several years — and that's true even under the most optimistic spending assumption, i.e., 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 fecundity below the already low levels shown in Figure D. Bonds lower fecundity in normal circumstances because bonds usually offer lower future returns than stocks. The ranges shown in Figure D apply to an all-equity portfolio and therefore presumably overstate the fecundity of a balanced stock and bond portfolio.

Spending Based on Market Values Is Inherently Unstable

Most endowments and trusts seek stable spending, but market values are anything *but* stable. Why, then, do investors use market values to determine spending? A few institutions base spending on market values and then compensate for changing prices by varying the percentage spending rate. But the far more common practice is to set a fixed percentage of market values (e.g., the ubiquitous 5%) and then stick with it through thick and thin. Fixed percentage-of-market-value spending rates will produce “unfixed” spending, in spite of attempts to smooth price volatility via averaging.

For investors who desire stable spending, a rule based primarily on dividends would seem best, because (as shown in Figure C) dividends are more stable than earnings or market values. A second option would be to base spending on earnings, although Figure C shows that 5-year or perhaps even 10-year averaging may be necessary to smooth earnings' hills and valleys. Dividends and 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 standard for evaluating evenhandedness has changed. Originally trustees compared beginning and ending nominal market values — e.g., the value of our endowment was $2 million in 1982; it is $2 million today; therefore we have been evenhanded. Today trustees

perform this exercise using real rather than nominal market values — e.g., the value of our endowment was $2 million in 1982; it is $4 million today; the cost of living doubled during this period; therefore we have succeeded. Yet this newer test is still faulty.

This preserving-real-market-value test is only appropriate in the unusual case where 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 where capital is used in endowment mode more or less in perpetuity, the logical way to measure evenhandedness is in endowment terms, i.e., by comparing the fecundity of the capital at the start of the period with its fecundity at the end. For endowments and long-duration trusts, the true test of intergenerational evenhandedness is preservation of fecundity, not preservation of market values.

Here's an example. The cost of living has doubled since 1981. By traditional evaluation standards, a $1 million endowment in 1981 would be the same as a $2 million endowment today. But does today's $2 million endowment have the same fecundity as the $1 million endowment had in 1981? Not by a long shot! In 1981 the fecundity of a $1 million endowment would have been between $54,000 (based on its dividend yield) and $125,000 (based on its earnings yield). Yet in 2003 the fecundity of a $2 million endowment — measured in 1981 dollars — would have been only between $16,000 (based on the dividend yield) and $44,000 (based on the earnings yield).[2]

The current near-universal method of demonstrating 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 twenty-plus years, market values have ballooned, but fecundity has not. In other words, due to sharply rising stock prices, it takes much more money to buy an endowment-like spending stream today than it would have taken in 1981. That's the downside of a bull market.

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. Instead, the primary risk facing endowments is fecundity risk — i.e., the risk of a decline in the earnings of and dividends from the corporations in which they're invested. The futures of endowments and long-duration trusts are inescapably bound to the futures of the American and world economies. Rather than worrying about market values, endowment and long-duration trust investors should worry about the following.

(1) *The quantity and quality of reported earnings*. Are current earnings overstated because some expenses aren't accounted for properly, or because poor acquisitions have yet to be marked down?

(2) *The true value of stock buybacks to shareholders*. Are stock buybacks really equivalent to dividend payments on a dollar-for-dollar basis?

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[2]Each year's fecundity equals market value times trailing S&P 500 earnings and dividend yields. The 2003 result has to be divided by 2 because the cost of living doubled between 1981 and 2003.

(3) *Dividend payout ratios*. In theory, lower payout ratios signal higher future earnings growth, because more profits are retained by corporations for new investments. In fact, however, just the opposite seems to be true.

(4) *Corporations' use of retained earnings*. The fact that fecundity equals dividends plus only a fraction of retained earnings suggest that a dollar of retained earnings is *less* valuable to investors than a dollar of dividends. A significant fraction of retained earnings is lost to long-term investors.

Why do 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 Is Before Expenses

If a particular endowment has a fecundity of, say, $F per year, that doesn't mean that the endowed institution can spend $F per year on its programs. Instead, that means that $F per year is available for a variety of purposes, of which programmatic spending is only one. There's an unfortunate hierarchy in the way the portfolio's "fecundity pie" gets divided. The first claim on the pie — for taxable trusts and a few foundations — goes to the IRS. Second claim goes to those who hold and manage the portfolio. The owner only gets what's left.

For the record, some institutions' spending is greater than their fecundity. This is perfectly proper at institutions for which new capital is coming in the back door (e.g., through development efforts) and at institutions with finite lives. This paper has addressed endowed institutions and trusts for which no new capital is forthcoming.

Unresolved Issues

Several issues deserve further attention.

The first unresolved issue is a more precise estimate of fecundity, one to replace the broad ranges offered here. The ranges are useful — for example, they throw cold water on the presumption that 5% spending today is evenhanded. But a precise estimate, or at least a narrower range, would be even more useful.

The second and most interesting issue may be why investors can't spend what their corporations earn, i.e., why fecundity is less than 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 stocks today lies approximately midway between their earnings and dividends. The midpoint between $450 billion and $160 billion is $305 billion. If this rough estimate is correct, then *$145 billion* ($450 billion less $305 billion) *is slipping through investors' fingers every year and disappearing down a sinkhole*. Yet only a few individuals seem to have noticed this phenomenon, and only the same few seem to care!

Finally, all sides seem to have given a bye to the value of stock buybacks. All sides sadly (and unbelievably) seem to accept the notion that spending $X on stock buybacks is 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 is very likely a good use of shareholders' money, and in this case $X of buybacks may do the remaining shareholders more good than $X of dividends. On the other hand, using cash to buy back stock that is selling at much more than fair value 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, buybacks increase fecundity. But done poorly, buybacks just toss money down a sinkhole. And buybacks to cover option grants have zero fecundity. An assumption that every dollar of buybacks is well spent is naive.

Conclusion

The utility of capital depends upon the time horizon during 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 period of time — let us say a lifetime — utility is a function of future total returns. For capital that will never be consumed (or not consumed for a long time), utility is 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, two hundred 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 ubiquitous 5% spending rate is too much 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 most important point that investors should focus on is 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 this paper's 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.

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