College and University Endowment Funds: Why Not 100% Equities?

_A modest proposal to increase equity holdings of educational endowments._

Richard H. Thaler and J. Peter Williamson

As of the end of fiscal 1993 (June 30 for almost all colleges and universities), total higher education endowment fund assets were reported at $92 billion by the Council for Aid to Education.¹ This is a substantial sum, whose whole purpose is to provide ongoing financial support to higher education. It seems appropriate to inquire how productive those assets are — and might be.

The question has been asked before. Back in the mid-1960s, McGeorge Bundy, then president of the Ford Foundation, expressed concern at the extraordinary conservatism he saw in the investment of endowment funds. The Foundation formed an Advisory Committee in 1967 to study and report on problems of endowment management. The result was the Barker Report, named after the chairman of that task force, which recommended a number of improvements in management practices, but said rather little about the allocation of endowment assets. There was some encouragement for shifting assets from bonds to stocks and some argument in favor of going beyond strictly blue-chip stocks. Mr. Bundy’s clear message, however, was that it was time for endowment funds to move from bonds to common stocks.

The Bundy advice was good, but its timing was unfortunate. Shortly after some college and university investment committees began to take these recommendations seriously, the stock market began a decade-long period of negligible returns. By 1974, there were bitter reflections on whether the Bundy advice was seriously

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misguided. Of course, those institutions that took the advice and stayed the course have been well-rewarded, but many others reduced their equity holdings at exactly the wrong time.

**ASSET ALLOCATION TODAY — THE “SIXTY-FORTY” RULE**

How are the assets of college and university endowment funds allocated today? The answer is close to 60% in equities and 40% in fixed-income (chiefly bonds). The 1993 NACUBO (National Association of College and University Business Officers) Endowment Study tells us that the allocation for 437 endowment funds as of June 30, 1993, was about 60% equities and virtually all of the remainder in fixed-income. Another study has shown that during the preceding decade the equity ratio had varied from about 53% to about 60% (see Williamson [1993]).

Is this asset allocation sensible? We believe these equity holdings are too low. In light of the historical evidence, we do not think that universities can afford to hold nearly half their portfolios in fixed-income securities. In this article we try to show why we believe that a larger commitment to equities is prudent, and we suggest a long-term investment strategy that offers the promise of higher long-term spending.

As readers of this Journal are well aware, there has been a substantial difference between equity returns and bond returns for a long time. The longest (and much studied) period that for which carefully calculated data are available is 1926–1993. The data are published by Ibbotson Associates in its annual *Yearbook*. Equity data are those for the S&P 500 Index, and the bond data are for long-term corporate bonds. One might examine other indexes of equity and fixed-income investments, but as a start the Ibbotson data will give some idea of the differences in the results of equity investing and of fixed-income investing, and of a mix.

A dollar invested in common stocks at the end of 1925, with income reinvested (colleges and universities do not of course reinvest all income, and this is something we will get to later), would have grown to over $800 as of the end of 1993, while a dollar invested in a sixty–forty mix of stocks and long-term corporate bonds would have grown to not quite $300. There were some rocky years for stocks up to about 1945, but since then it is pretty clear that stocks have outperformed bonds very substantially, and have outperformed a sixty–forty mix by a fair margin.

Sixty-nine years of history have shown the superiority of stocks. But there may be some question about what may happen over shorter periods of time. It turns out that over the sixty–eight years there are ten periods of ten years’ length in which a sixty–forty mix outperformed an all-stock portfolio. There are also two twenty–year periods in which this happened. As the periods lengthen, the likelihood of stocks underperforming bonds decreases. Over the 1926–1993 period there are no thirty–year periods in which the sixty–forty mix outperformed stocks.

While stock returns are more volatile than bond returns, numerous studies have shown that as the investment horizon increases, the chance of stock returns exceeding bond returns approaches 100%. Since endowment fund managers are supposed to have, by law, a more or less infinite horizon, why do endowments hold so many bonds?

Part of the appeal of bonds is historical in nature. Endowment funds have traditionally been managed using a rule that principal would be maintained for posterity and only the “income” spent. Originally the definition of income was simply interest on bonds and dividends from stocks. Under this rule, bonds have a strong appeal simply because they generally pay more income, and thus permit more spending.

Unfortunately, the rule makes little sense on two counts. First, if the desire is to maintain the endowment for posterity, then presumably it should be maintained in real, not nominal, terms. That is, the purchasing power of the endowment should be maintained. If there is inflation, then a policy of spending the interest and leaving the nominal principal intact will actually draw down the real value of the endowment at the rate of inflation.

Second, the distinction between income and capital gains (which were taken to be changes in wealth, not income), while appropriate in cases where the beneficiaries of principal and income are not the same, could not be justified for a college endowment where the college is entitled to both income and principal.

The latter confusion was largely corrected by studies commissioned by the Ford Foundation and ultimately by the Uniform Management of Institutional Funds Act, now adopted in over thirty states (see Cary and Bright [1969, 1974]). The language of the statute varies a little from state to state, but essentially it provides that in the case of true endowment funds, where
principal is to be maintained, the institution may spend
the income plus a "prudent" portion of both realized
and unrealized capital gains.

Institutions that are subject to the Uniform Act,
and whose trustees have decided to use the freedom it
permits, generally establish a spending rate in the form
of a percentage of market value. Since the spending
consists now of income plus some appreciation (which
together constitute the "total return" on the endow-
ment), such a spending rule is generally known as a
total return spending rule.

Ways of determining an appropriate spending
percentage, and implementing a total return spending
rule, are discussed in Williamson [1993]. It turns out
that most institutions following this rule spend between
4% and 5% of the market value of their endowments.

While modern spending rules eliminate the
need to hold bonds to provide income, these rules can
provide a new reason to hold bonds: the desire to
smooth spending. A common device to provide for
smooth year-to-year spending under the total return
procedure is to spend a percentage of a three-year mov-
ing average of endowment value. If this leaves too
much volatility in the spending amount, the averaging
can be extended to a longer period. (Ennis and
Williamson [1976] describe spending rules to achieve
smooth spending patterns.)

In general, an institution can achieve almost any
degree of smoothing of year-to-year spending with an
averaging approach, but some trustees may still be
encouraged to hold fixed-income securities to achieve
the same result.

So the existence of a spending rule may act to
shorten the planning horizon of the investment com-
mitee. Instead of focusing on investment returns over
an infinite horizon, or even a finite but long horizon
such as twenty or thirty years, investment committees
may be concerned with the volatility of year-to-year
endowment values and their impact on spending. These
concerns are strengthened by psychological factors.

Psychologists Kahneman and Tversky [1979]
have shown that decision-makers display a trait they call
"loss aversion." Loss aversion refers to the fact that the
pain of losing a sum of money is greater than the plea-
sure of gaining the same amount of money.
Experimental evidence suggests that people are roughly
twice as sensitive to losses as to gains. This is relevant
to the issue at hand if investment committees get fre-
quent (e.g., quarterly) reports on the value of the
endowment portfolio and are inclined to act on short-
term results.

Benartzi and Thaler [1995] show that when
investors are loss-averse, and evaluate their portfolios
often, they become intolerant of risk. They call this
problem "myopic loss aversion." In their framework,
investors with true twenty-year investment horizons
would choose portfolios of virtually all equities, while
those with a horizon of only one year would choose
something close to a fifty-fifty mix. In the context of
endowment fund management, the Benartzi and
Thaler analysis suggests that the concern over one-year
investment results pushes portfolio managers and
investment committees toward bonds, just as the spend-
ing rule may.

But as we have seen, while holding a substantial
portion of the portfolio in bonds may be understand-
able, it is costly. Consider a hypothetical university with
a $250 million endowment invested $150 million in
stocks and $100 million in bonds. Suppose that the
equity premium is 5%, less than the historic 7%. Then,
the expected cost of putting the $100 million in bonds
rather than stocks is $5 million in the first year alone.
Considering that the spending from the endowment
would be $7.5 million annually (with a 5% spending
rule), $5 million is a rather large price to pay for
smoother spending and a penchant for focusing on the
short term.

Furthermore, a 5% spending rule is not consist-
tent with maintaining endowment purchasing power if
the endowment is invested in bonds. If bonds pay their
historical 3% real return, then a 5% spending rule
implies that the bond portfolio is depreciating by 2% a
year. This problem is exacerbated by the fact that the
portfolio is frequently rebalanced.

In the hypothetical case above, it would be bad
even to allow the $100 invested in bonds to be gradu-
ally eaten away by inflation, but investment commit-
tees compound the cost by continually buying more
bonds to restore the desired sixty-forty asset allocation.
(Since stocks typically outperform bonds, on average
portfolio managers who maintain a constant mix are
selling off stocks to buy bonds.)

EXPERIENCE WITH ACTUAL ENDOWMENT
FUNDS — THE COMMON FUND

So far we have been dealing with indexes, and
while both stock index and bond index funds are avail-
EXHIBIT 1
VALUE OF A FUND INVESTED 60% IN COMMON FUND EQUITY FUND AND 40% IN COMMON FUND BOND FUND AT JUNE 30, 1976, AND OF ONE INVESTED 100% IN EQUITY FUND

Notes: Fund allocations in first case rebalanced quarterly to sixty-fourty. Spending for both portfolios is the same and equals what the income would be on the sixty-fourty portfolio (values plotted are logarithms).

able today, there is not a long history of their use in the management of endowments. Even index funds require some expenditure on management fees and transaction costs, and their performance cannot be expected to come up to the performance of the pure index itself.

We turn now to consider the use of two funds actually available for college and university endowment investing since August 1, 1976. The Common Fund, an organization formed to manage the investments of educational institutions, inaugurated its Equity Fund on July 1, 1971, and this Fund has been available since then.5

The Common Fund first offered a Bond Fund on August 1, 1976. Suppose, then, we examine the results of investing in the Common Fund Equity and Bond Funds. We investigate two investment strategies. One is to divide the endowment between the Common Fund Equity Fund and the Common Fund Bond Fund, investing 60% in the former and 40% in the latter. The sixty-fourty mix is maintained by transferring funds at the end of each quarter. The second strategy is to invest 100% in the Common Fund Equity Fund. Since the "norm" appears to be a sixty-fourty mix, it seems reasonable to assume that the income generated by such a mix meets the spending objectives of most endowments fairly well.

So we will assume that whether the endowment follows the first investment strategy or the second, the spending will be the same. It will be the income that would be generated following the sixty-fourty mix.

Exhibit 1 compares the value, quarter by quarter, from the end of September 1976 through the end of March 1994 of the sixty-fourty mix with the value of the all-equity fund, assuming exactly the same spending on a quarterly basis from each fund.6 It is pretty clear that the all-equity fund produced significantly greater value as of the end of the first quarter of 1994, and delivered exactly the same spending over the years. In fact, with a starting investment of $1,000 at the end of September 1976, the sixty-fourty mix would have grown to $3,430, while the all-equity portfolio would have grown to $5,511.

Would the spending have impaired at any point the principal of the Equity Fund investment? This is a question of importance to some (but not all) endowment funds. So-called true endowment is endowment for which the principal must be maintained. This means that the institution may not spend more than the income (we are still following the traditional spending rule).

In the case of the sixty-fourty mix, the spending is precisely the income. But in the case of the all-equity portfolio, we are spending what would be the income on a sixty-fourty mix. Over the seventy quarters, we spent more than the income on our all-equity fund in most quarters. We were clearly making up the difference by spending appreciation. Yet there is enough appreciation left to produce a substantially higher value at the end of the period.

Nevertheless, we somehow have to deal with the problem of spending more than income. The most obvious answer is to have some so-called quasi-endowment, or funds functioning as endowment. These are funds the trustees of the institution have decided to treat as endowment funds, and indeed to invest along with the true endowment funds.

Sometimes these funds come from surpluses of revenue over expenditures; sometimes they consist of the reinvestment of income that the trustees are legally free to spend but decide not to. Sometimes they come from gifts made by donors who do not insist that the principal of their contributions remain intact.

Most institutions with large endowment funds have significant amounts of quasi-endowment, which may legally be spent at any time. For those that do not, the overspending of income that we have discovered may present a problem. The problem may be solved,
EXHIBIT 2
INCOME AND SPENDING FOR A FUND INVESTED $600 IN COMMON FUND EQUITY FUND AND $400 IN COMMON FUND BOND FUND AT JUNE 30, 1976

Notes: Fund allocations rebalanced quarterly to sixty-forty. Spending equals income through end of fiscal 1978-1979, thereafter spending each fiscal year equals either income or 4.5% of the average of the three preceding December 31 fund values, with spending spread equally over the four quarters of the fiscal year (values plotted are logarithms).

However, at least substantially, by the total return spending rule we discussed above.

Exhibit 2 shows the difference between spending the income, and spending 4.5% per year of market value for a sixty-forty mix of the Common Fund Equity Fund and the Common Fund Bond Fund. The rule is implemented in this way: For each fiscal year, beginning July 1, we take the average of the three market values of the endowment at the three preceding December 31s. And we spend 4.5% of this average in four equal amounts at quarterly intervals.

For the first spending calculation illustrated in Exhibit 2, for the fiscal year July 1, 1979-June 30, 1980, we take the values of the endowment at December 31, 1976, 1977, and 1978. This happens (for $1,000 invested in the sixty-forty mix on September 30, 1976, and rebalanced quarterly) to be $1,023.88. (Until July 1, 1979, we simply spend the income because we don’t have three years of history for averaging.)

Using an annual spending rate of 4.5%, or 1.125% per quarter, we spend 1.125% of the $1,023.88 on each of September 30 and December 31, 1979, and March 31 and June 30, 1980. Then for the fiscal year July 1, 1980, through June 30, 1981, we average the fund values on December 31, 1977, 1978, and 1979, to arrive at $1,065.08, and spend 1.125% of this amount on September 30, 1980, and so on. This procedure produces a reasonably stable level of spending and also provides a reasonable lead-time for budgeting.

Exhibit 2 shows that the total return spending starts out somewhat lower than spending of income alone, but catches up and passes income spending by the end of 1990. An experienced trustee will also notice that the sharp decline from spending income to total return spending shown in 1979 is almost certainly unacceptable. As a practical matter, the spending will probably have to be kept to at least the 1978 level until the total return formula catches up.

Once again we consider the choice between actually investing in a sixty-forty mix, or exclusively in the Equity Fund, while spending (this time on the basis of the total return formula) as though we had invested in the sixty-forty mix.

Exhibit 3 compares the value of the sixty-forty portfolio with the value of the all-equity portfolio, with this identical spending. Not surprisingly, the all-equity

EXHIBIT 3
VALUE OF A FUND INVESTED 60% IN COMMON FUND EQUITY FUND AND 40% IN COMMON FUND BOND FUND AT JUNE 30, 1976, AND OF ONE INVESTED 100% IN EQUITY FUND

Notes: Fund allocations first rebalanced quarterly to sixty-forty. Spending for both funds is the same and equals income through end of fiscal 1979 on the sixty-forty portfolio; thereafter spending in each fiscal year equals 4.5% of the average of the three preceding December 31 fund values of the sixty-forty portfolio. Spending is spread equally over the four quarters of the fiscal year. Values plotted are logarithms of fund value.

FALL 1994

THE JOURNAL OF PORTFOLIO MANAGEMENT 31

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portfolio delivers the greater value by March 31, 1994.

Once again, the spending from the all-equity fund is generally greater than the income on that fund. But now that we are using the total return spending formula, it is legally permissible to spend a "prudent" portion of appreciation. What is still forbidden is spending that brings the value of the endowment below the initial investment. Such spending would clearly be in excess of appreciation.

It turns out that in our example this never happens. Once the total return spending was established, on July 1, 1979, the market value of the equity portfolio never dropped below the original $1,000.

The history of the Common Fund Equity and Bond Funds, over the seventeen and one-half years since both funds have become available, would suggest that the Equity Fund has proved superior to a mix of the two, regardless of institutional spending preferences. This is subject to one reservation, in the case of the institution that has no quasi-endowment.

Some thought must be given to the possibility that a spending target cannot be achieved within the limits even of the total return spending rule. Although this rule is not infringed in our example, it is always possible, particularly in the early years of an all-equity investment policy, that it might be.

It may still be worth one further check on the seventeen-and-one-half-year Common Fund history. Suppose instead of starting our series at the end of September 1976, we had started at the end of September 1987, just before the market break in October 1987, and surely the worst time in many years for investing in common stocks.

Had we invested $1,000 at that time in the sixty-forty mix, and spent the income on that combination, at the end of March 31, 1994, our portfolio would have been worth $1,450. Had we, on the other hand, invested the entire $1,000 in the Equity Fund and again spent what the income would have been on a sixty-forty mix, our value at March 31, 1994, only six and one-half years later, would have been $1,523, or 5% more.

It is easy to imagine the dismay only a month later of the trustees of an institution that sold its bonds and bought stocks in September of 1987. But had they held on just to 1994, their judgment would have been vindicated. Sometimes, of course, it takes a little longer.

**FURTHER EXPERIENCE — WITH MUTUAL FUNDS**

The Common Fund experience, of course, gives us only seventeen and one-half years of data. And there are those who will argue that more history is needed before one can be confident of the superiority of an all-equity strategy.

We can provide further confirmation, over a longer period of time, of the conclusions drawn from the Common Fund experience. Exhibit 4 is based on investment experience of the Wellington Fund and the Windsor Fund. The Wellington Fund is a member of the Vanguard Group of Investment Companies, and
was founded in 1928. It is regarded as a “balanced” fund; as the lower panel of Exhibit 4 indicates, its proportion of stocks is generally between 60% and 70%.

The Windsor Fund is also a member of the Vanguard Group. It was organized in 1958. It is generally characterized as a “common stock” fund; the lower panel of Exhibit 4 indicates that it is generally between 85% and 100% invested in stocks. The two funds therefore provide an approximation of the choice between a sixty-forty mix of the Common Fund Equity and Bond Fund and 100% investment in the Common Fund Equity Fund.

The upper panel of Exhibit 4 shows the growth of an investment in the Wellington Fund, where only dividends are spent, and an investment in the Windsor Fund, where the spending is equal to the dividends on the Wellington Fund. This comparison is essentially the same as the comparison between investing in a sixty-forty mix of the Common Fund portfolios and 100% in the Common Fund Equity Fund.

It is clear that over thirty-five years’ growth has been much greater for the Windsor Fund investment. It also appears that over the first fifteen years or so, when both funds were available, it was not so clear which would achieve the higher growth. An investment in common stocks may require a fairly long time to prove its superiority.

RELEVANCE OF MARKET TIMING STRATEGIES

It may be worthwhile considering a strategy followed by a number of institutions, at least to some extent, that may appear to challenge the analysis already described. This strategy is market timing, or tactical asset allocation, which consists in moving back and forth between stocks and bonds according to forecasts as to which will be the more profitable investment over the relatively short-term future.

Without going into the merits of a timing strategy, it may be enough to observe that the most successful timing strategies involve deviations from a long-run allocation strategy. That is, if the long-run “normal” asset allocation is 60% in equities and 40% in bonds, the market timing strategy will call for deviations from this standard mix, on the basis of short-term expectations.

All of our discussion above, comparing a sixty-forty mix with 100% invested in equities, suggests that if a market timing strategy is to be used, the “normal” asset allocation from which deviations may be called for should be 100% investment in equities. In answer to the question how can one shift from bonds to stocks if the starting point is 100% in equities, one might propose the use of options on a stock index.7

SHIFTING FROM A SIXTY-FORTY MIX TO A HIGHER PROPORTION OF EQUITIES

We have presented rather strong evidence of the superiority of equities over bonds for long-term investors, and we conclude that endowments should be holding more in equities than they do now. Of course, it may not be easy to increase equity holdings suddenly. Trustees are by nature a cautious breed, and a tradition decades old is not easily discarded. Moreover, short-term results may be discouraging, as in the case of buying stocks in September 1987.

In fact, many experienced trustees and investment counsel argue against increasing the proportion in equities precisely because of the fear that if stocks crash trustees will lose their courage and sell off stocks at the worst possible time. There is indeed a real possibility of this happening, and it has happened before at some institutions.

Have we then found a good reason for the sixty-forty policy? Only if we accept the frailty of trustees as a good reason. And how much could this frailty cost colleges and universities? One percent of the $92 billion of endowment value is probably a conservative estimate, or close to a billion dollars a year! Is that a fair price to pay, a reasonable alternative to either educating trustees or assuring that the investment committee is made of sterner stuff?

One method of adjusting gradually to a greater commitment to stocks, without a dramatic change from a traditional sixty-forty policy, is to stop rebalancing, and let the growth of stocks carry the proportion of stocks upward. (We appreciate that few boards of trustees regularly rebalance their endowment portfolios to maintain a constant sixty-forty mix. But we assume that they are likely occasionally to rebalance, if only by directing new contributions in a manner that restores the desired proportions.8 For purposes of illustration we assume annual rebalancing.)

We can see the effect of such a transition in Exhibit 5. It is based upon the historic record for stocks and for long corporate bonds, taken from the Ibbotson
EXHIBIT 5
ANNUAL SPENDING AND VALUES 1926-1961 OF THREE PORTFOLIOS STARTING AT $100 AT THE END OF 1925

Notes: Portfolios are: 1) all-stock; 2) a mix of 60% stocks and 40% bonds not rebalanced; 3) starting at sixty-forty and rebalancing annually. Spending is 4.5% of three-year average market value. Values plotted are logarithms.

Yearbook and already referred to. The plots show the consequences of three different investment strategies. One is to have invested 100% in common stocks at the end of 1925, and to remain 100% in common stocks through 1961. The next is to start out with a sixty-forty mix at the end of 1925, but to do no rebalancing, so that the appreciation in the stocks carries the fraction of the portfolio in stocks to 94% by 1961 (and to 97% by the end of 1993). The third strategy involves rebalancing at each year-end to bring the mix back to sixty-forty. Spending is set at 4.5% of the average market value at the preceding three year-ends.

The upper panel of Exhibit 5 shows that between 1926 and 1961 sometimes the rebalanced portfolio performed best, and sometimes it performed at least second best. From about 1950 on, however, the all-stock portfolio produces the greatest spending, while the regularly rebalanced portfolio produces the least (and this ranking continues through 1993, with the differences growing, although the graph does not show this).

Similarly, Exhibit 5 shows that starting in the 1950s the value of the all-common stock portfolio rises above that of the portfolio with no rebalancing, which in turn rises above that of the regularly rebalanced portfolio. So eventually the non-rebalancing strategy pays off, but it can take a long time.

Exhibit 6 covers the time period 1965 through 1993 (1965 was a particularly unfortunate year to enter the stock market), and shows once again the long time it can take for the non-rebalancing strategy to succeed. Over this period of almost thirty years, regular rebalancing actually outperforms abandonment of rebalancing. The reason is that 1966 was a poor year for stocks, and the proportion of stocks, beginning at 60% at the end of 1965, dropped to about 57% at the end of 1966.

In the case of the rebalanced portfolio, the 60% proportion is restored at the end of 1966 with a beneficial impact on subsequent performance. But for the portfolio that is not rebalanced, there were fewer stocks to take advantage of the market’s rise in 1967 and 1968. Similarly, 1974 was a poor year for stocks, and rebalancing at the end of that year had a significantly beneficial effect on the subsequent rise in value of the portfolio.

A MODEST PROPOSAL FOR IMPROVED PERFORMANCE

In view of the very long time it may take for the benefits of simply abandoning rebalancing to arise, we propose a gradual approach we will call an asymmetric rebalancing strategy. The strategy is simple. Suppose a university is using a traditional sixty-forty mix between equities and bonds. If at the end of the next year the return on stocks has been less than the return on bonds, the portfolio is rebalanced to sixty-forty just as it would be normally.

If stocks outperform bonds, however, so that the value of the equity holdings rises above 60% of the portfolio, no rebalancing takes place. If stocks continue to earn higher returns than bonds, the proportion of
EXHIBIT 6
ANNUAL SPENDING AND VALUES 1965-1993 OF THREE PORTFOLIOS STARTING AT $100 AT THE END OF 1965

![Graph showing annual spending and values for three portfolios from 1965 to 1993.]

Notes: Portfolios are: 1) all-stock; 2) a mix of 60% stocks and 40% bonds not rebalanced; 3) starting at sixty-forty and rebalancing annually. Spending is 4.5% of three-year average market value. Values plotted are logarithms.

the portfolio held in stocks will grow. If at any time the proportion of stocks falls below 60%, the portfolio is rebalanced; otherwise there is no rebalancing.

Notice that the portfolio composition changes quite slowly. For example, suppose that in the first year of this new policy, stocks earn 25% and bonds 6%. Stocks would now be 63.9% of the portfolio instead of 60%. Nevertheless, over a long period of time, the policy can have a dramatic effect.

EXHIBIT 7
ANNUAL SPENDING AND VALUES 1926-1961 OF THREE PORTFOLIOS STARTING AT $100 AT THE END OF 1925

![Graph showing annual spending and values for three portfolios from 1926 to 1961.]

Notes: Portfolios are: 1) all-stock; 2) a mix of 60% stocks and 40% bonds with asymmetric rebalancing; 3) starting at sixty-forty and rebalancing annually. Spending is 4.5% of three-year average market value. Values plotted are logarithms.

equities, a sixty-forty mix with annual rebalancing (AR), and the same mix with asymmetric rebalancing (AS-R). In 1961 the spending amounts are $29, $17, and $25, respectively. In 1993 the annual spending amounts for the three plans are: $186, $78, and $155. Although both the AR and AS-R strategies begin at a sixty-forty mix, by 1993 the AS-R plan is well ahead of the rebalancing strategy (and well ahead of the non-rebalancing strategy, which would have produced spending of $115 in 1993).

Exhibit 7 shows that the AS-R strategy does surprisingly well. Although the extra exposure to stocks made the effect of the crash more pronounced, annual
EXHIBIT 8
ANNUAL SPENDING AND VALUES 1965-1993 OF THREE PORTFOLIOS STARTING AT $100 AT THE END OF 1965

What effect does the asymmetric rebalancing strategy have on asset allocations? Obviously, the answer to this question depends on the performance of the two assets in question. To show how asset allocations would have evolved for the two time periods discussed above, we have plotted the proportion of the portfolio in stock in Exhibit 9, for the period 1926–1961 (top panel) and 1965–1993 (lower panel). With the earlier starting date, the portfolio is over 96% in equities by 1961. If the policy had been implemented in 1965, the proportion in stocks is (in 1993) approaching only 80%.

We have seen that implementing the asymmetric rebalancing strategy would have worked quite well, even if it had been adopted at unfortunate times, such as 1926 or 1965. Yet this is all predicated on the histor-

spending is only slightly more volatile than a straight sixty-forty division, and the AS-R strategy yields spending that is close to that of the AR strategy during the decades of the '30s and '40s. By 1951 all three strategies are producing the same spending level, but as the postwar bull market takes over, spending for the equities and AS-R strategies takes off.

Exhibit 8 shows the effect of the asymmetric rebalancing over the period beginning in 1965. Spending in 1993 is only slightly ahead of spending for an annual rebalancing strategy, but farther ahead of the non-rebalancing strategy. Thirty years have not been long enough to make a great deal of difference.

NOTES: Portfolios are: 1) all-stock; 2) a mix of 60% stocks and 40% bonds with asymmetric rebalancing; 3) starting at sixty-forty and rebalancing annually. Spending is 4.5% of three-year average market value. Values plotted are logarithms.

EXHIBIT 9
RATIO OF STOCKS TO TOTAL VALUE WITH PORTFOLIO BEGINNING AT 60% STOCKS AND 40% BONDS AND NOT REBALANCED, AND ONE WITH ASYMMETRIC REBALANCING

36 COLLEGE AND UNIVERSITY ENDOWMENT FUNDS: WHY NOT 100% EQUITIES?
The technical fact that stocks have in fact earned higher returns than bonds. What happens if the equity premium falls, or disappears altogether? How would the AS-R strategy perform in these circumstances?

The answer is that, in most circumstances, the AS-R strategy will do no worse than the traditional sixty-forty rebalancing plan. If over the next twenty years there should be no equity premium, the initial sixty-forty mix will be retained. If the equity premium is smaller than it has been historically, the proportion of the portfolio in stocks will simply grow more slowly than it would in the case of a large equity premium.

Indeed, the worst case scenario is roughly what was observed with the 1926 starting date. That is, the proportion in stocks grew to 72% in 1929, so the crash had a very pronounced effect. We know this worst case scenario was not a disaster, and because the rewards can be substantial, we feel the strategy has merit.

ENDNOTES

1The Council, at 342 Madison Avenue, Suite 1532, New York, N.Y. 10017, publishes annual statistics on voluntary support of education and financial data for colleges and universities, including endowment fund values.

2For example, using the 1926-1988 data, and assuming the future will be drawn at random from past experience, Butler and Domian [1991] estimate that the chance of stocks underperforming bonds over a twenty-year period is about 5%. If the result is adjusted for the fact that stock returns are mean-reverting over long time periods (bear markets are more likely to be followed by bull markets), then this risk is lower.

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5The Common Fund was established in 1971 with the sponsorship of the Ford Foundation. Its offices are in Westport, Connecticut, and it has under management approximately $15 billion for 1,300 member schools.

6Logarithms of value, rather than the values themselves, are plotted in the graph. A steady upward trend in the logarithm of value indicates a constant percentage increase.

7There is a considerable literature on the subject of tactical asset allocation, much of it originated by Robert D. Arnott, President and Chief Financial Officer of First Quadrant Corporation, in Pasadena, California.

8Robert Arnott has published some useful advice on rebalancing.

REFERENCES


