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## *Liabilities and Endowment Management*

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### *Overview*

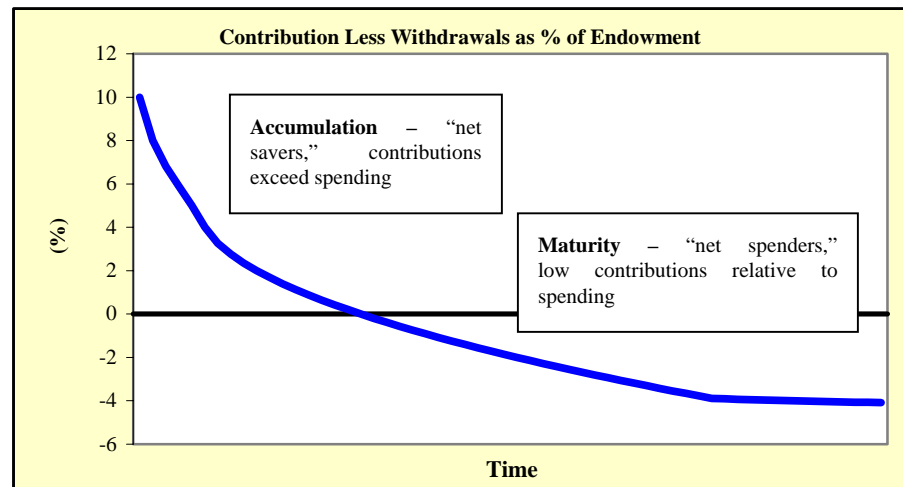
The damage done to pension plans' funding levels due to the bear market incurred for equities and lower interest rates has raised plan sponsors' awareness of liability management over the past few years. There has been far less attention given to this issue by endowment and other not-for-profit fund managers. Indeed, liability management is usually less important for such plans because future liabilities are amorphous. Pension plans are obligated to pay promised benefits and those benefits are measurable. Conversely, endowment funds can alter spending based on future circumstances. This flexibility of future spending makes it difficult to evaluate liabilities. Nevertheless, considering liabilities is a constructive exercise. It can help fund officers gain insight into risk tolerance for an institution, which ultimately could affect the asset allocation decision.

### *Investment Horizon for Endowments*

Most endowments are expected to exist in perpetuity, and, therefore, can be thought to have an infinite time horizon. However, they should not necessarily invest that way because of spending. The fact that an endowment is a net withdrawer of capital (or will be at some point in the future) means that the investment horizon for an endowment is *not* infinite. For example, barring new gifts, an institution with a \$100 million endowment that spends \$5 million per year that *must* increase with inflation, will spend the average dollar of current market value within 15 years in present value terms. Considering the investment horizon may help to understand an institution's risk tolerance. The investment horizon for an endowment will vary based on a number of underlying factors.

One factor in the investment horizon for an endowment is its lifecycle position. As with individual investors, endowments have a lifecycle and where they are in the lifecycle should affect the risk tolerance. Like a young worker, an institution with a small endowment that is aggressively raising money is a "net saver." The money currently in the endowment is less important because future expected contributions are high. For such funds, the investment horizon is very long. It may be several years before the expected contributions fall below the spending level. Therefore, risk tolerance could be higher. A significant decline in the market is a lesser risk because on a net basis, money is not withdrawn at distressed prices. In fact, a market decline could be viewed as a positive because future contributions will be invested at more attractive prices.

Exhibit 1: Endowment Lifecycle



As a fund's balance grows, it becomes more difficult to continue to raise contributions at the same percentage rate, so eventually the spending rate will exceed the endowment contribution rate. When contributions become a fraction of annual spending, the endowment enters its mature phase. In the mature phase, year-to-year market volatility is more important than before since the endowment is a "net spender." If the market falls, securities must be sold to meet spending needs. Since market risk has a greater affect on mature endowments, they have a shorter investment horizon and should have lower risk tolerance.

A second factor that should be considered when establishing risk tolerance is spending flexibility. If there is a significant decline in the endowment's value because of market losses, to what extent can dollar spending be cut? The ideal spending flexibility would be an endowment that could choose not to spend during periods of poor market performance so securities never have to be sold at distressed prices. Of course, this goes against the purpose of endowments—to provide predictable stream of income to the supported institution.

Spending flexibility will depend on each institution's specific situation. One way to assess spending flexibility is the annual contribution of the endowment to the operating budget. An endowment that contributes a small percentage to the operating budget is probably better able to reduce dollar spending (to keep the spending rate level) during severe market environments. Therefore, they could have higher risk tolerance. An endowment that contributes 20% or more to the operating budget (such as for several large, independent universities) would probably find it difficult to materially lower dollar spending during adverse market environments, which means that spending rates must increase at the worst time. Such institutions should have lower risk tolerance.

The spending rate should also affect risk tolerance, especially for institutions that have low spending flexibility. For instance, given a 25% decline in an endowment's value due to market losses, an institution with an initial 3% spending rate would have to increase the spending rate to 4% to keep dollar spending constant. A 4% spending rate is still very reasonable. An institution with a 5% initial spending rate, however, would have to increase the spending rate to 6.7% to keep dollar spending constant. At a 6.7% spending rate, purchasing power becomes difficult to maintain.

Exhibit 2 integrates these ideas in a grid. An institution with high spending flexibility (low contribution to operating budget) and a low spending rate relative to gifts should be more willing to take investment risk than an institution with low

spending flexibility (high contribution to operating budget) and a high spending rate relative to gifts.

Exhibit 2: Risk Tolerance Matrix

	Higher	← Spending Flexibility →	Lower	
		<i>Low % of operating budget</i>	<i>High % of operating budget</i>	Longer, Net Savers
Low Spending Relative to Gifts		<i>higher risk tolerance</i>		↑ Investment Horizon
High Spending Relative to Gifts			<i>lower risk tolerance</i>	↓ Shorter, Net Spenders

Considering liabilities poses a “Catch-22” for institutions. **As the spending rate increases, the need to take risk increases, while the ability to take risk declines.** Institutions with a low spending rate relative to gifts are in the position to take greater risk, but may not have a compelling reason to do so. Institutions with a high spending rate and low contribution rate may feel the pressure to take on additional risk to maintain purchasing power. However, they are often in the worst position to take risk, especially if they have low spending flexibility. If market returns meet expectations, everything works out, but a brutal bear market can raise the spending rate to an unmanageable level.

*Liability Risk:  
Inflation Versus Deflation*

Liabilities, and the ease by which they are met, are largely affected by future price levels. For pension plans, inflation can be positive (provided there is no cost of living adjustment). Future fixed obligations will be easier to meet because money is worth less. (Of course, inflation is bad for the plan beneficiaries.) Deflation can be debilitating for pension plans, because it becomes harder to meet nominal obligations (future money is worth more).

For endowments, the situation is opposite. Inflation is a significant risk for endowments because costs for the institution will increase, requiring ever larger distributions from the endowment to keep services the same. Deflation is positive in some ways, because it reduces cost pressures on the budget, and distributions from the endowment go further. Admittedly, this view is too simplistic in many respects. However, we believe it is reasonable to assume that inflation is a larger risk for most endowments than deflation when liabilities are considered. For this reason, endowment investments should be tilted towards assets that protect against inflation.

Comparing real spending in the 1930s to the 1970s illustrates the impact of deflation versus inflation. As shown Exhibit 3, an institution with a 70% equity and 30% fixed income portfolio with a 5% spending rate (on a trailing 3 year market value) would have seen the real value of its endowment spending drop by 65% from 1967 through 1983. The institution had to wait until 1999 to reach the real value of 1967 spending again. The Great Depression was comparatively mild because of deflation. The real value of spending declined by only 21% from 1931 through 1933 and completely recovered by 1936, as shown in Exhibit 4.

Exhibit 3: Real Spending From 1967 to 1999

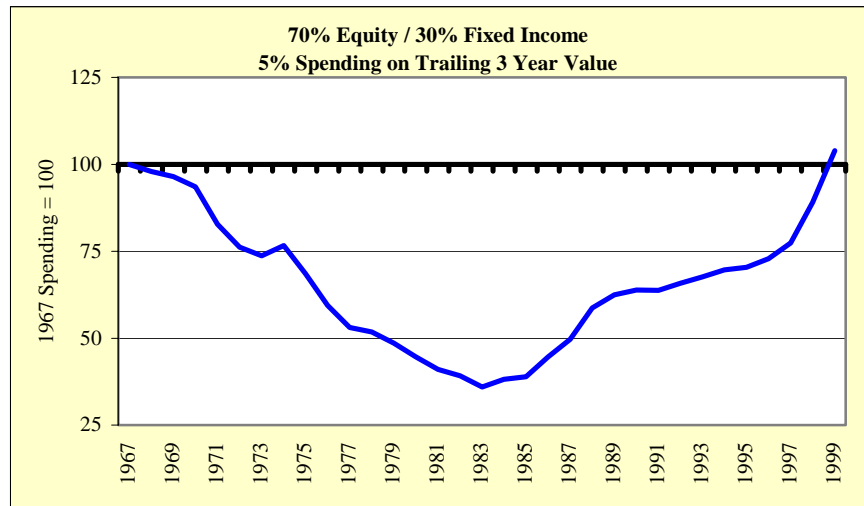
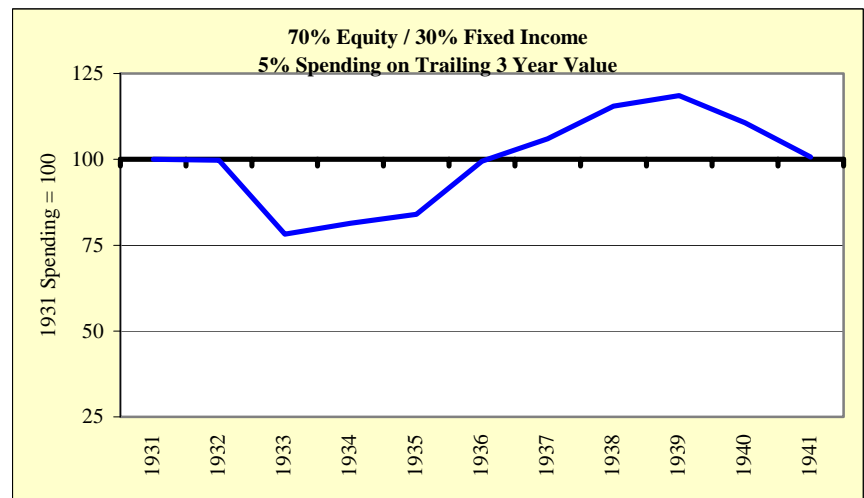


Exhibit 4: Real Spending During the Great Depression



*Investment Implications*

Considering liabilities when constructing the asset allocation could lead to a more appropriate portfolio for an institution. We outlined two themes to bear in mind when constructing an asset allocation—(1) investment horizon and (2) inflation protection.

For the investment horizon, institutions with a short investment horizon (high spending rate relative to gifts and low flexibility) should have lower exposure to equities because they exhibit greater risk and favor assets that dampen volatility of the portfolio. Of course illiquid alternative investments pose even more risk. Because the investments are locked in, a decline in traditional assets would put added pressure on spending maintenance, since a portion of the portfolio is off limits (beyond what is received in distributions). Institutions with a longer investment horizon (low spending relative to gifts and high flexibility) are better able to withstand the volatility inherent in equity investing.

With respect to inflation protection, unexpected inflation is likely to be more damaging to endowments than unexpected deflation. For this reason, portfolios should be constructed to provide inflation protection, regardless of the investment horizon. Inflation-protected bonds are more attractive than nominal bonds for this reason. Exposure to other real assets, such as real estate and natural resources (oil & gas and timber), is beneficial for inflation protection. Equity investments also offer good protection against inflation over the long-term because earnings power

increases with inflation, but they are a poor short-term hedge against inflation (witness the 1970s).

In Exhibit 5, we show three sample portfolios for institutions with different investment horizons, plus the average NACUBO portfolio. Asset classes are divided into three broad categories—(1) growth assets, (2) risk reduction assets, and (3) inflation protection assets. Growth assets include public and private global equities, which we expect to provide high total returns over the long-term. These assets should also provide inflation protection over the long-term. The risk reduction assets include absolute return strategies and nominal bonds. Their purpose is to reduce the standard deviation of the portfolio, thereby reducing the year-to-year spending volatility. The inflation-protection assets include inflation-protected bonds and real assets (real estate, natural resources, etc.). They are meant to provide protection against secular inflationary environments, such as experienced in the 1970s.

As expected, of the three portfolios shown, the lower risk tolerance portfolio has the lowest standard deviation, the lowest probability of a substantial loss year (greater than a 10%), and a better lowest likely return than the higher risk tolerance portfolio. Of course, the lower risk tolerance portfolio gives up nearly 1% in expected return over the long-term versus the higher risk tolerance portfolio.

Exhibit 5: Asset Allocation Expectations

	Lower Risk Tolerance	Medium Risk Tolerance	Higher Risk Tolerance	NACUBO Average
	A	B	C	D
<b>Growth Assets</b>				
Public Equity	25%	33%	40%	58%
Private Equity	10%	12%	15%	2%
<b>Total Growth Assets</b>	<b>35%</b>	<b>45%</b>	<b>55%</b>	<b>60%</b>
<b>Risk Reduction Assets</b>				
Cash				6%
US Fixed Income	15%	10%	5%	26%
Absolute Return	15%	15%	15%	6%
<b>Total Risk Reduction Assets</b>	<b>30%</b>	<b>25%</b>	<b>20%</b>	<b>38%</b>
<b>Inflation Protection Assets</b>				
US Inflation Protected Fixed	15%	10%	5%	2%
Real Assets	20%	20%	20%	
<b>Total Inflation Protection Assets</b>	<b>35%</b>	<b>30%</b>	<b>25%</b>	<b>2%</b>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Return</b>				
Real Long-Term Expected Return	6.2%	6.6%	7.1%	5.2%
Real 10 Yr. Horizon Return (Mean Reversion)	5.1%	5.4%	5.8%	3.0%
<b>Risk (L/T Expectations)</b>				
Standard Deviation (1 Yr.)	±9.1%	±10.5%	±12.2%	±11.0%
Probability of Loss Year	23.5%	24.9%	26.1%	30.0%
Probability of 10% or Worse Loss	3.4%	5.2%	7.2%	7.5%
Lowest Likely Return (1 Yr.)	-14.5%	-17.3%	-20.5%	-19.8%
Sharpe Ratio	0.46	0.44	0.42	0.29
<b>Downside Probability at 5.0% Goal Return</b>				
Based on L/T Compound Return (10 Yr.)	34.0%	31.2%	28.9%	47.7%
Based on 10 Yr. Horizon Return (10 Yr.)	49.0%	45.6%	42.1%	71.3%

*Conclusion*

We have outlined a framework for endowments and other not-for-profit institutions to consider liabilities when constructing their asset allocation. When considering liabilities, investments in inflation-sensitive assets become more important. Furthermore, institutions with high spending rates relative to gifts and low spending flexibility should be more cautious about taking risk in their asset allocation. This leads to a conundrum for such institutions—unless they take risk, they will be unable to meet their goal returns. For those institutions, the problems are better addressed on the spending side, rather than gambling on the investment side.

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