



Preface

The favorable investment and debt-financing environment over the last few years provided exceptional opportunities for colleges and universities. Now, however, the ground has shifted. Today's credit market turmoil has caused a number of colleges and universities to reassess their overall capital management policies and practices.

Since Harry Markowitz's initial description in 1952 of a system to optimize portfolios of risky assets, the concept of portfolio selection has become a useful and important element in endowment management. This same concept of portfolio diversification—where individual components of assets and liabilities combine into aggregate characteristics with less volatility—is now being applied to develop effective asset and debt management strategies for colleges and universities.

Much of the academic literature on asset–liability management has focused on the concept of managing the “surplus” for the balance sheet of financial institutions such as insurance companies. Although the balance sheet, of course, determines much of the strategy, it is often the operating budget performance that provides the primary application for capital management strategy.

Capital Structure and Risk Management

William Massy's essay in this volume, “Capital Structure and Risk Management,” explores risk in the operating portfolio, including debt service volatility and its relation to investment risk. Moving beyond an initial review of the application of investment management terms and concepts such as “portfolio,” “volatility,” “correlations,” “risk,” and “expected values” to the “operating portfolio,” Massy boldly introduces what he describes as a “paradigm shift” involving a “simultaneous analysis of operational and investment risk.”

He suggests that this analysis of “uncertainty” in the university's operating portfolio can be assessed using the now familiar tools of investment management such as Monte Carlo simulation: “One models the linkages among the revenue and cost items, makes assumptions about their standard deviations and correlations, and then calculates and displays a measure of volatility for,

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say, the university's operating margin."

Asserting that the "analysis of uncertainty in the operating portfolio" is rare, he outlines a series of analytical methods for risk analysis of the operating budget, including assumptions about the volatility of revenues, expenses, and changes in fund balances.

Drawing a distinction between capital structure models for nonprofit and for-profit organizations, Massy suggests that, unlike a for-profit venture, a nonprofit enterprise is much more concerned about the effects of uncertainty and volatility than expected net profit. In short, avoiding downside risks, according to Massy, is central to nonprofit capital management.

He then defines the elements required for this nonprofit planning model. Massy proposes to focus on the volatility of operating margins. Taking a holistic view, his analytical formula includes not only an analysis of the interaction between the volatility of an institution's revenue and cost streams but also the returns on various assets. As he points out, "The effect of risk on operating margin depends on asset allocations, debt service, and the mix of income and expenditure items."

Massy's earlier work, *Planning Models for Colleges and Universities* (1981), outlines in detail the "trade-offs" involved in "uncertainty-absorbing" budget models and smoothing strategies for endowment spending or, to use David Swensen's articulation in *Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment* (2000), the "tension between the competing goals of preservation of the endowment and stability in budgetary support." Shifting provocatively away from this usual articulation of the "spending-saving relationship" between budget needs and endowment spending rates in moving to financial equilibrium, Massy now proposes to use the endowment to hedge the operating budget of the college or university, explicitly suggesting that asset allocation targets be adjusted based on expected changes in the operating budget—including debt service. Using mathematical formulas, he asserts that operational risk should be mitigated by adjusting an institution's endowment asset allocation.

After outlining his proposal to use the endowment to hedge operational risk, Massy provides two examples of the application of this idea. First, he proposes that we analyze and incorporate into the endowment investment policy the possible correlations between expected future gift flows (which he sees as a kind of "virtual endowment") and investment returns. For instance, a college or university's expectation of a large gift from, say, a venture

capitalist should, according to Massy, impact the amount of money invested in venture capital in the endowment.

Second, he suggests that an institution's understanding of a "large and risky research venture" and the related potential gifts, incremental research revenues, costs, and debt service should be studied and, possibly, lead to an adjustment to the permanent endowment's asset allocation.

Ultimately, Massy's paper focuses on possible risk in a college or university operating portfolio and its relation to investment risk. He asserts that the mitigation of this downside risk is central to what he calls "nonprofit capital structure optimization." His discussion of internal policies for debt capacity provides a helpful corrective in line with current capital market and rating agency guidelines, which now focus far more on the importance of operating measures such as annual debt service to budget measures than on the more traditional debt to balance sheet measures.

John Core's "Capital Structure and Risk Management Discussion" provides a helpful overview of Massy's provocative thesis to use the endowment portfolio to manage operating portfolio risk. Placing the discussion in the context of risk management generally, including asset-liability matching, Core endorses Massy's view that nonprofit institutions tend to focus on risk aversion for a number of reasons, including the fact that nonprofit and public institutions are dependent on debt financing and are therefore more likely to respond to the safety needs of bondholders as expressed through the rating agencies.

Building on Massy's proposition to use the endowment to hedge the operating budget risk of colleges and universities, Core suggests that the relative size of an institution's endowment "will affect the costs and benefits to a given university when using the endowment as a risk management tool." For example, Core concurs with Massy's suggestion that a college or university could issue typically lower-cost variable rate debt to fund a project, "but then offset that floating rate exposure by adding floating rate assets to its endowment." This type of "natural hedge" rationale is usually drawn upon when speaking of the relationship between variable rate debt and short-term working capital management rather than in the context of permanent endowment.

Independently, Core adds that an institution's "risk aversion likely increases as the endowment becomes smaller relative to the university's operating budget." For

instance, he compares the investment and operating risk strategy of Yale to that of the University of Pennsylvania. Cores suggests that Yale University, due to its larger endowment (he cites \$18 billion versus Penn's \$6 billion in 2005) and smaller operating budget (about \$2 billion for Yale and \$4 billion for Penn, according to Core), "likely behaves in a less risk-averse fashion than Penn" since, presumably, Yale could weather a 20 to 30 percent loss in its endowment while such a loss could very well "bankrupt" an institution with an endowment the size of Penn's.

Core explores the potential impact on the operating budget of different investment asset allocations based on various points along the risk-reward spectrum of investments. Pursuing the hypothesis that nonprofits tend to adopt risk-averse investment and operating strategies, Core reviews an example from Massy's paper that traces the analysis involved in adjusting the endowment based on the operating budget. To adjust the inherent risk of a particular project, the "university has used its endowment to reduce its risk by lowering its allocations in more risky equities and real estate and increasing its allocation in less risky bonds."

In an important footnote, in which Core refers to Swensen's work, Core claims that "Yale can afford to undertake the high-risk, high-reward asset choices that Swensen does (because they can afford large short-term losses)" due to the university's larger relative endowment. This articulation of Swensen's core argument misses a fundamental tenet of Swensen's contribution that a portfolio of truly diversified assets with an equity bias and without the opportunity costs of fixed income can, in fact, "generate high expected returns with low levels of risk." Of course, as Swensen points out elsewhere, the size of an endowment can impact the ability of an institution to create such a truly diverse portfolio.

Still, the acceptance of illiquidity and the development of value over time in a permanent endowment portfolio are critical to Swensen's portfolio management framework. He observes: "Often interested parties take a longer view. Donors generally embrace a long-term orientation, having decided to provide permanent support through endowment funds instead of opting to contribute temporary funding for current operations." In fact, it is precisely in this context that Swensen acknowledges the "difficult-to-resolve tension between the desire to

support the institution's current programs and an obligation to preserve assets for future generations."

Like Massy, Swensen recognizes that endowment assets can provide a cushion to the operating budget, whether by paying out an unusually large distribution to address "disruptive fiscal issues" or, due to the financial strength represented by the endowment, to "create borrowing capacity." And he explicitly refers to the endowment as a buffer for budgetary stability: "By placing a substantial emphasis on budgetary stability, the university expresses a strong preference for using the endowment to reduce the impact of financial shocks."

However, unlike Massy, Swensen emphasizes the difference in time horizon between long-term endowment asset allocation decisions and current operating budget management. In response to Henry Hansmann's paper "Why Do Universities Have Endowments?" (1990), he traces Yale's own history since the 1950s of using "endowment assets to shield the operating budget from disruptive fluctuations in income streams."

Swensen sees the issue as a tension between the conflicting "long-term goal" of preserving the purchasing power of endowment assets and the "intermediate-term goal" of providing stable budgetary support. And he shows that spending policies work to resolve this tension between strategic time horizons: "By achieving the long-term goal of purchasing power preservation and the intermediate-term goal of substantial stable budgetary support, colleges and universities meet economist James Tobin's requirement that an endowment 'preserve equity among generations by supporting the set of activities that it is now supporting.'"

While Massy acknowledges that endowment smoothing rules play an important risk mitigation role for the endowment return's impact on budget planning, he also seems to suggest that an institution's asset allocation should be adjusted further based on year-to-year planning and budget expectations.

In a helpful contribution to this discussion about the interplay between the endowment asset allocation and operating budget management, Core recognizes that Massy's shift to adjusting permanent asset allocations based on current operating budget expectations beyond spending policy adjustments may allow too much of the

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endowment to be used for current operations and “possibly overly constrain the portfolio managers.”

To consider possible correlations between operating budget items and asset returns in the permanent endowment, which could lead to many changes in investment asset allocation policies, as Massy suggests, first requires development of a strategic framework for thinking about an institution’s capital structure and management.

Developing a Capital Management Framework

The overall objective of capital management is to optimize the use of capital. An integrated capital plan would take account of debt capital and equity capital in the form of the endowment. In this case, equity capital refers to gifts and contributions as well as the surplus of revenues over expenditures an institution is able to add to its balance sheet, all of which is contained in the permanent endowment. Measures of risk tolerance would be determined within the overall strategic framework of the institution. As such, construction of a capital management

framework should begin with a review of the institution’s asset and liability mix as well as its operating cash flows and business strategies, as follows:

1. *External constraints.*

Certain legal and regulatory restrictions are among the external constraints likely to have the biggest impact on capital management decisions. For instance, tax-

exempt debt management for colleges and universities involves understanding the implications of indirect cost recovery; regulations pertaining to the use of facilities funded with tax-exempt bonds; limitations on arbitrage with proceeds from tax-exempt bonds; possible restrictive covenants, as in loan agreements; and unique opportunities and limitations involved in issuing tax-exempt bonds.

Likewise, an institution’s fund-raising and development arms must be coordinated with the debt strategy plans, especially in situations where gifts are tagged or identified for specific purposes and thus become ineligible for tax-exempt financing. In addition, accounting and legislative factors form important parameters for institutional decision making.

2. *Philosophical constraints.* An institution’s charter and bylaw mandates as well as its enterprise business objectives and mission may place certain parameters on an institution’s capital management framework. An institution’s fundamental assumptions and limits regarding operating margins, cost of investment, capital spending, debt structure, debt capacity, leverage, credit rating, and target returns on the capital employed must all be reflected in its capital management strategy. A review of these basic assumptions is required on a regular basis to ensure that the financial operations of the enterprise reflect the aims of the college or university.

3. *Financial constraints.* A college’s or university’s financial condition and the costs and benefits associated with its fundamental debt management decisions present certain challenges in developing a capital management strategy. For the most part, capital management concentrates its time and effort on *capital structure management*, since this has the most direct impact on the endowment’s returns and the cost of borrowing. However, *liquidity management*, *operational management*, and *credit management* may also play a significant role in shaping an institution’s capital management strategy. Each of these key elements is discussed below:

a. *Liquidity management.* Liquidity management can be defined and measured in terms of an institution’s ability to access the markets required to make investments in the endowment portfolio as well as to finance operational and debt service requirements in an expedient and cost-effective manner. Liquidity management implies the maintenance of cash positions to meet short-term liability requirements even when the cost of “carry” on the cash invested is negative. In fact, the current capital markets’ dislocation has caused a number of institutions to reassess their liquidity position for both debt and investment reasons.

b. *Operational management.* Operational management, or risk of the so-called back office or settlements operations, is best incorporated with the audit and accounting functions, since these risks are an integral part of the systems and legal documentation integrity.

c. *Credit management.* Credit management issues appear most frequently for finance and business officers in connection with ongoing rating agency and investor relations management across a broad array of college and university credit factors. At times, certain credit rating guidelines are articulated. For instance, in the corporate sector major industrial companies commonly articulate a specific rating guideline of staying in the investment grade category, as did General Mills in a recent annual

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report. These rating guidelines are a shorthand for a great deal of strategic and competitive analysis.

At other times, a specific rating agency guideline is not articulated; a broader strategic intent is outlined instead. For instance, the University of North Carolina at Chapel Hill articulates the university's credit rating guidelines as part of its debt policy in its 2007 comprehensive annual financial report. It states a goal to "manage the university's credit to maintain the highest acceptable credit, which will permit the university to continue to issue debt and finance capital projects at favorable interest rates while meeting its strategic objectives. The university will limit its overall debt to a level that will maintain an acceptable credit with the bond rating agencies."

d. *Capital structure management.* Equity and debt capital structure management involves establishing a rigorous methodology based on cost and risk objectives, strategic and performance horizons, and cost and risk measures. Because the potential advantages of capital structure management are so great, it deserves a closer look.

A Closer Look at Capital Structure Management

In general, capital structure management based on endowment and debt management is composed of six essential categories: cost objective and risk objective, strategic horizon and performance horizon, and cost measure and risk measure.

1. *Cost objective:* the objective of the institution regarding management of the cost of investing and borrowing. The nearly universal objective is to minimize the cost of incremental new financings and to optimize the return of the investment while decreasing the embedded cost of the existing debt capital portfolio.

2. *Risk objective:* the objective of the enterprise regarding the uncertainty of risk-adjusted endowment returns and spending policies as well as the cost of borrowing. The aim here is to minimize the variability or uncertainty of the cost of incremental new investments and financings as well as to minimize the embedded risk and cost of the existing capital debt portfolio. The idea is not to view the variability of borrowing costs in isolation but within the context of the institution's operating budget and cash flow as well as its balance sheet.

3. *Strategic horizon:* the time horizon under which the institution defines, analyzes, and evaluates its long-term financial policy objectives. This horizon typically corresponds to the planning cycle used by the institution and will range from one to 30 years, though most institutions

focus on a period between five and 10 years.

An effective capital structure requires a recognition of the appropriate strategic time horizon for evaluating the interplay between long-term, permanent endowment asset allocation choices and short- and intermediate-term budget planning decisions.

4. *Performance horizon:* the time horizon under which the institution evaluates its incremental progress toward its objectives under the strategic horizon. This horizon can range from a month to one year or longer depending on the nature of the investment and liability management process and the pace of investments, transactions, and capital markets.

5. *Cost measure:* the units in which the cost of the endowment and debt portfolio are measured. Typically, the debt portfolio is measured in either a mark-to-market internal rate of return or yield, a book or original cost internal rate of return or yield, or a present value; the endowment is measured by a series of comparable benchmarks and risk-adjusted return parameters as well.

6. *Risk measure:* the units in which the uncertainty or variance of the cost measure is denominated. Typically, the risk measure is determined by the selection of the investment return and cost measure and is reported as absolute variance for the purpose of performance evaluation. It is also cast in statistical terms (most often standard deviation) for strategic and analytical purposes.

Discussion

Cost and risk objectives are among the most difficult to ascertain, since these require making assumptions about the fundamental operating and business goals of any given enterprise. They often involve input from nonfinancial colleagues within the institution. While the objective categories appear relatively straightforward at first glance, they are typically the most difficult to define for two reasons: First, the objectives themselves are diametrically opposed, at least in efficient debt capital markets, where cost and risk are negatively correlated. For instance, in the current market, lower-cost variable rate debt entails greater risk in the form of cost uncertainty. Second, to make meaningful asset and liability management decisions, the financial officer requires a great deal of information about the precise nature of the risk/return and cost/risk trade-off. The discipline required both to define these objectives and to establish risk/return and cost/risk decision-making frameworks is one of the most important elements of any capital structure management process.

Strategic and performance horizons inherent in capital structure management are also somewhat paradoxical in nature, since they include both a short-term and a long-term perspective. Again, these two relatively simple but crucial categories may become problematic because of the inherent conflicts that short-term and long-term perspectives necessarily entail. For example, employing a short-term perspective alone would not allow the finance team to anticipate large movements in the return of various, distinct asset classes and interest rates, which could ultimately undermine a capital structure strategy over the long term. And, as previously discussed, it could seriously distort the interplay and balance between the competing objectives of long-term endowment management and intermediate-term budget planning. Alternatively, a long-term perspective does not accurately account for short-term capital structure decisions, including possible opportunities offered by various changes in the markets such as the current credit market dislocation. In addition, actively incorporating two horizons in any analytical methodology substantially increases the technological requirements of the system used to produce information and make measurements.

Unlike the objective and horizon categories, cost and risk measures in this financial model are more

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complementary. Measurement of the cost and risk of an institution's endowment and debt portfolio must be consistent with the measurements used in the operational budget planning process. This must be flexible enough to report on the results of contemplated investment strategies and transactions and prospective scenario analyses. It is also important, of course, that the institution communicate these various measures—especially the risk measure—to other, nonfinancial professionals within the institution.

While these conceptual categories form the essential foundation of a capital structure management strategy, they cannot become viable unless incorporated into a framework that can be used by policy makers and endowment and debt portfolio managers alike. Capital management involves a rigorous and continuous assessment of the conceptual framework that underpins an institution's objectives, horizons, and measurements. It is our hope that the robust ideas and discussion that follow contribute to the successful execution of the complex and challenging task of capital structure management.

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