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Yale University Investments Office: June 2003

Burly men lugged boxes full of computer equipment and office furniture. Throughout the office, files were being boxed up and carted off. The Yale University Investments Office was in the process of moving from a converted Victorian-era mansion on the Yale campus, its home for the past dozen years, to an office building a few blocks away.

Yale's chief investment officer, David Swensen, looked over the hectic scene. Whatever the short-run pain of the move, he mused, the benefits of having the Investments Office staff on a single floor were sure to be substantial.

His thoughts turned to the larger challenges associated with the management of the university's Endowment, which totaled $11.0 billion in June 2003. Under Swensen's leadership, and with the guidance and approval of the Investment Committee, Yale had developed a rather different approach to Endowment management, including substantial investments in less efficient equity markets such as private equity (venture capital and buyouts), real assets (real estate, timber, oil and gas), and "absolute return" investing. This approach had generated successful, indeed enviable, returns. Swensen and his staff were proud of the record that they had compiled and believed that Yale should probably focus even more of its efforts and assets in these less efficient markets. At the same time, the very success of their strategy had generated new questions. How far did they think Yale should or could go in this direction? How should they respond to the growing popularity of the approach they had chosen? Given the difficult times that private equity funds were facing, should this asset class continue to play an integral role in Yale's portfolio?

Background[1]

Ten Connecticut clergymen established Yale in 1701. Over its first century, the college relied on the generosity of the Connecticut General Assembly, which provided more than half of its funding. The creation of a formal Endowment for Yale was triggered by the 1818 disestablishment of Congregationalism as Connecticut's state religion. Students and alumni alike demanded that the school respond by establishing a divinity school to offer theological instruction. To fund this effort, numerous alumni made large gifts, the first in a series of successful fund drives. While Yale used many of these donations to buy land and construct buildings, other funds were invested in corporate and railroad bonds, as well as equities. By the century's end, the Endowment had reached $5 million.

[1] This section is based on Brooks Mather Kelley, *Yale: A History* (New Haven: Yale University Press, 1974); David F. Swensen, *Pioneering Portfolio Management: An Unconventional Approach to Investment Management* (New York: Free Press, 2000); and Yale University Investments Office, *The Yale Endowment* (New Haven: Yale University, 2002).

Professor Josh Lerner prepared this case. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

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The growth of the Endowment rapidly accelerated during the first three decades of the 20th century. This was due both to several enormous bequests and to aggressive investments in equities, which comprised well over half the Endowment's portfolio during the "roaring" 1920s. In 1930, equities represented 42% of the Yale Endowment; the average university had only 11%.[2] Yale avoided severe erosion of its Endowment during the Great Depression in the 1930s, however, because many quite recent bequests were kept in cash or Treasuries, rather than being invested in equities.

In the late 1930s, Treasurer Laurence Tighe decided that the share of equities in Yale's portfolio should be dramatically reduced. Tighe argued that higher taxes were likely to expropriate any corporate profits that equity holders would otherwise receive even if a recovery were to occur. He argued that bonds would consequently perform better than stocks. His decision, which stipulated that at least two dollars would be held in fixed income instruments for every dollar of equity, set the template for Yale's asset allocation over the next three decades. The Treasurer and Trustees continued to manage the Endowment themselves during this period, selecting individual bonds and high-yield or income-oriented stocks for the portfolio. These policies seemed very prudent in the late 1930s and 1940s. But unfortunately, they were less well-suited for the bull market of the 1950s and 1960s. In the mid and late 1960s, in response, the Endowment's Trustees decided upon two substantial policy shifts.

First, the Trustees decided to increase substantially the University's exposure to equity investments. In this decision, they were influenced by a task force sponsored by McGeorge Bundy, president of the Ford Foundation. This committee—which included Kingman Brewster, president of Yale—argued that most university endowments had taken too conservative an approach: "It is our conclusion that past thinking by many endowment managers has been overly influenced by fear of another major crash. Although nobody can ever be certain what the future may bring, we do not think that a long-term policy founded on such fear can survive dispassionate analysis."[3]

Second, Yale decided to contract out much of the portfolio management function to an external advisor. The school helped to found a new Boston-based money manager, Endowment Management and Research Corporation (EM&R), whose principals were well-known successful growth stock investors recruited from other Boston money management firms. The plan was that EM&R would function as a quasi-independent external firm, and would be free to recruit additional clients. At the same time, Yale would be its largest client and would have priority over other clients.

The high expectations for EM&R were never realized. Like other universities, Yale saw its Endowment's value plummet in the ensuing years because of a "bear" market, accelerating inflation, and operating deficits. Between 1969 and 1979, the inflation-adjusted value of Yale's Endowment declined by 46%. While the investment performance was not that unusual relative to other endowments, it nonetheless severely strained the financial fabric of the University. Yale terminated its relationship with EM&R in 1979, and embarked upon a program to use a variety of external advisers in its evolving asset management framework.

[2] General university information is from Institutional Department, Scudder, Stevens & Clark, *Survey of University and College Endowment Funds* (New York: Scudder, Stevens & Clark, 1947).

[3] Advisory Committee on Endowment Management, *Managing Educational Endowments: Report to the Ford Foundation* (New York: Ford Foundation, 1969).

David Swensen and the Investments Office in 2003

In 1985, David Swensen was hired to head the Investments Office. William Brainard, Yale's provost at the time, and James Tobin persuaded their former student—Swensen had earned his Ph.D. in Economics at Yale in 1980—to leave his post at Lehman Brothers. The position offered not only the opportunity to help Yale, but the possibility of some teaching in Yale College as well.

In the succeeding 18 years, Swensen built the capabilities of the Yale Investments Office. Most importantly, he recruited and developed a quite small but very high-quality internal staff. Dean Takahashi, whom Swensen had known as a Yale student, was recruited into the Investments Office and had become Swensen's primary lieutenant. The two worked extremely closely together. In fact, in the preface to Swensen's book, *Pioneering Portfolio Management*, he described the contents as his and his colleague's "joint intellectual property." A number of other staff had also been recruited over the years, often recent graduates of Yale College. There were a total of 20 employees (16 professionals) in the office in June 2003. Swensen encouraged his staff to be active members of the larger Yale community, and he had chosen his office's near-campus location to signal that the Investments Office was an integral part of the University and its financial management function.

Swensen defined the role of the Investments Office broadly. Reporting to the President and to an Investment Committee (described below), the Investments Office had overall responsibility for Endowment matters. While most of its day-to-day activities involved evaluating, selecting, monitoring, and overseeing external investment advisers, it also played a critical role in the entire policy-making process. For example, it was responsible for recommendations on both the investment policy and the spending policy for the Endowment—that is, in broad terms, how the money should be invested and how much of it could be spent in any given year.

The Investment Committee, to which the Investments Office reported, was composed of influential and knowledgeable Yale alumni, a number of whom were quite active in different segments of the asset management business. The Committee as a whole functioned as an active, involved board, meeting quarterly and providing advice, counsel, and ultimately approval of the various investment managers. In addition, David Swensen often consulted with individual members of the Investment Committee on issues within their areas of specific expertise. This helped guide the thinking and recommendations of the Investments Office on various key issues; and it fostered an atmosphere of advice and support within which the Investments Office could take quite different and sometimes unconventional stances if it believed in them and could convince the Investment Committee of their merit.

Investment Philosophy

Perhaps the most fundamental difference between Yale and other universities was its investment philosophy. Swensen was fond of quoting John Maynard Keynes' maxim that "worldly wisdom teaches us that it is better for reputation to fail conventionally than to succeed unconventionally."[4] Nonetheless, Swensen was willing to take "the risk of being different" when it seemed appropriate and potentially rewarding. By not following the crowd, Yale could develop its investment philosophy from first principles, which are summarized below.

First, Swensen strongly believed in equities, whether publicly traded or private. He pointed out that equities are a claim on a real stream of income, as opposed to a contractual sequence of nominal cash flows (such as bonds). Since the bulk of a university's outlays are devoted to salaries, inflation

[4] John M. Keynes, *The General Theory of Employment Interest and Money* (New York: Harcourt Brace, 1936), Chapter 12.

can place tremendous pressure on its finances. Not only do bonds have low expected returns relative to more equity-like assets, but they often perform poorly during periods of rising or highly uncertain inflation. To demonstrate convincingly why he believed in the long-run advantages of equity investing, Swensen would often refer to the actual cumulative long-run returns over past decades. An original one-dollar investment in December 1925 in large-company U.S. stocks would be worth $1,775 by the end of 2002 and small company stocks, $6,816; a comparable investment in U.S. Treasury bonds would be worth $60; and Treasury bills, $17.[5]

A second principle was to hold a diversified portfolio. In general, Yale believed that risk could be more effectively reduced by limiting aggregate exposure to any single asset class, rather than by attempting to time markets. While Swensen and his staff usually had their own informed views of the economy and markets, they believed that most of the time those views were already reflected in market prices. They thus tended to avoid trying to time short-run market fluctuations, and would over-weight or under-weight an asset class only if a persuasive case could be made that market prices were measurably misvalued for understandable reasons.[6]

A third principle was to seek opportunities in less efficient markets. Swensen noted that over the past decade, the difference in performance between U.S. fixed income managers in the 25th and 75th percentiles (of their performance universe) was minimal, and the difference in performance between U.S. common stock portfolio managers in the 25th and 75th percentiles was approximately 3% per annum. In private equity, in contrast, this same performance difference exceeded 20% per annum. This suggested that there could be far greater incremental returns to selecting superior managers in nonpublic markets characterized by incomplete information and illiquidity, and that is exactly what Swensen and his staff endeavored to do.

Fourth, Swensen believed strongly in utilizing outside managers for all but the most routine or indexed of investments. He thought these external investment advisors should be given considerable autonomy to implement their strategies as they saw fit, with relatively little interference from Yale. These managers were chosen very carefully, however, after a lengthy and probing analysis of their abilities, their comparative advantages, their performance records, and their reputations. The Investments Office staff was responsible for developing close and mutually beneficial relationships with each of these external managers. The staff prided themselves on knowing their managers very well, on listening carefully to their ongoing advice, and on helping to guide them, if and when appropriate, on various policy matters. From time to time, the Investments Office effectively "put a team in business" by becoming a new manager's first client. And it was not uncommon for managers to consider Yale as one of the most important of their clients.

Finally, the Yale philosophy focused critically on the explicit and implicit incentives facing outside managers. In Swensen's view, most of the asset management business had poorly aligned incentives built into typical client-manager relationships. For instance, managers typically prospered if their assets under management grew very large, not necessarily if they just performed well for their clients. The Investments Office tried to structure innovative relationships and fee structures with various external managers so as to better align the managers' interests with those of Yale, insofar as that was possible.

[5] R.G. Ibbotson Associates, *Stocks, Bonds, Bills and Inflation* (Chicago: R.G. Ibbotson Associates, 2003).

[6] Yale actively rebalanced its portfolio to maintain its target asset allocations, however, and this led to frequent short-term adjustments in its holdings. For instance, as equity values rose in the summer of 1987, Yale sold stocks in order to return to its target allocation level. After the stock market crash later that year, the Endowment repurchased many of the same securities as it sought to raise its asset allocation back to the target level.

Recent Asset Allocation and Performance Results

Yale's Investment Committee annually reviewed its Endowment portfolio to decide on target allocations to the various asset classes. The actual allocations in recent years are shown in **Exhibit 1**, which illustrates the recent upward trend in the allocation to the private equity, real assets, and absolute return classes, as well as the current (2003) target allocations. The comparable asset allocations for several groups of university endowments are shown in **Exhibits 2** and **3**. Private equity allocations for large institutions (including both pension funds and endowments) are shown in **Exhibit 4**.

As a part of the planning process, the Investments Office had completed a "mean-variance analysis" of the expected returns and risks from its current allocation, and compared them to those of past Yale allocations and the current mean allocation of other universities. These computations, which relied on specific assumptions about the expected returns, volatilities, and correlations among asset classes, posed several issues. First, because these relationships can change dramatically over time, the Investments Office did not just rely mechanically on historical data, but instead modified the historical numbers based on its own experience. Second, the Investment Office imposed limits on the amount that could be invested in each asset class. If it did not, the optimization program would instruct Yale to hold no domestic equities (or even to short-sell this asset class), and to instead invest in the more illiquid alternatives. This result followed naturally from the assumptions of the model: for instance, private equity was projected to have nearly twice the real return of U.S. equities (11.4% vs. 6.0%), albeit with a higher standard deviation (29.1% vs. 20.0%). (Over the past decade, actual returns had been considerably higher for both asset classes, and standard deviations—measured quarterly—lower.) The imposition of these constraints reflected the need of the university to diversify its holdings as well as the substantially greater imprecision with which Yale could assess the risk and return of its alternative assets. The results of this comparative mean variance analysis are shown in **Exhibit 5**.

In addition, the Investments Office examined the long-run implications of its allocation for the "downside risk" to the Endowment. In keeping with a quantitative format for analyzing long-run downside risk that had been used on prior occasions, the Office examined the probability that the available Endowment spending would fall by more than 10% (adjusted for inflation) over a five-year period; the Office also examined the probability that the inflation-adjusted value of the Endowment would fall by more than one-half over the next 50 years. To undertake this analysis, the Investments Office employed a probabilistic Monte Carlo analysis, which simulated and compiled thousands of possible random outcomes drawn from an assumed distribution of returns and correlations used in the simpler "mean-variance analysis." This "downside risk analysis" suggested that the probability of a 10% spending fall within any five-year period was 23%, and that of a 50% fall in purchasing power over a 50-year horizon was 11%.

Yale's allocation philosophy and distinctive approach to investing had paid off handsomely. In fiscal year 2002, the fund had returned 0.7%. The positive return, while small, compared favorably to the 18.0% decline in the S&P 500 and the 9.2% decline in EAFE. Moreover, the Endowment managed to overcome substantial private equity writedowns. This performance was above Yale's large peers (Columbia, Harvard, MIT, Princeton, and Stanford) who averaged –2.6%, as well as all universities as measured by National Association of College and University Business Officers (a mean of –6.0%). Even more impressive had been the fund's long-run performance since Swensen and Takahashi arrived at Yale. Over the 15 years ending in June 2002, Yale's annualized return was 14.2%, exceeding the return of all colleges and universities. This result was more than 2.7% per annum better than Yale's "peers" (other nontaxable endowments with over $1 billion in assets) and about 4.3% per

annum better than the average of all such endowments.[7] (The Endowment's performance during recent years is compared to that of other universities in **Exhibit 6**; a more detailed breakdown of Yale's returns by asset class is reported in **Exhibit 7**.) Yale's record placed it in the top 1% in SEI's rankings of large institutional investors.[8] Not only had the average return been high, but the Endowment had avoided losing funds: the University had not had a negative return since 1988.

The primary reason for Yale's superior long-term performance record had been the excess returns generated by the portfolio's active managers. Manager selection accounted for more than half of the superior performance by Yale relative to the average endowment over the last five years. As expected, the Endowment's excess returns had been greatest in the least efficient markets. Over the 10 years ending in June 2002, the annualized differences between Yale's asset class returns and related benchmarks were 0.9% in the most efficiently priced asset class, bonds, and 23.1% in what is probably the least efficient market, private equity.

The Investments Office and the Investment Committee had been pleased with these results. As their experience with the distinctive approach grew, and they had become more confident of their ability to produce sustained above-average results, they had adjusted their spending policy upward. In 1992, in response to an Investments Office recommendation, the Yale Corporation adjusted the University's long-term target spending rate upward from 4½% to 4¾% of Endowment assets; and in 1995, it adjusted the rate upward again to 5%.[9] The University was thus benefiting from the strength of its investment program in two ways, both from a larger Endowment and from the justified increase in the target spending rate. The substantial Endowment also played a role in Yale receiving the highest rating to finance capital projects (AAA/Aaa) from the two leading bond rating agencies, and in the university's ability to borrow money at extremely favorable interest rates.

The Management of Marketable Securities

The investment philosophy outlined above guided Yale's management decisions in all of its asset classes. For example, Swensen and Takahashi approached bonds with skepticism. They viewed the Endowment's current target allocation of 7.5% in bonds primarily as a disaster reserve, guarding against a severe drop in asset values and/or deflation (such as in the Great Depression). Yale held U.S. government issues (almost exclusively): Swensen was skeptical about whether returns from U.S. corporate bonds adequately compensated investors for the added default risk and the callability of corporate issues. He was quite skeptical of foreign fixed income securities as well.

Unlike most of the rest of its portfolio, the Investments Office managed its bond portfolio internally. Swensen believed that the government bond market was so efficient, and the spread between the performance of government bond fund managers so small, that it did not make sense to hire an outside manager. The portfolio was managed with no attempt to add value through trading on interest rate movements. The Endowment staff attempted to generate incremental returns only through modest security selection bets—for example, by using private placements issued by the Private Export Funding Corporation (PEFCO), which were backed by the full faith and credit of the United States.

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[7] Had the Yale Endowment generated investment performance over the previous 15 years at the equal-weighted average of all university endowments, the Endowment in June 2002 would have been $5.1 billion smaller.

[8] Corporate defined benefit plans with in excess of $100 million in assets.

[9] The amount of the Endowment spent each year was based on a simple formula, namely, the spending rate (currently 5%) times the current value of the Endowment, with a 30% weight, and the value of last year's spending increased by inflation, with a 70% weight.

Yale also owned a substantial number of U.S. common stocks, though the current target allocation, 15% of assets, was surprisingly small relative to almost all other large institutional investors. Although Yale had been an early adopter of indexing, as the Investments Office staff had become increasingly confident in their ability to find superior managers it eliminated the passive portfolio in favor of a small number of active equity managers. These managers shared several characteristics. First, the majority of Yale's active equity managers tended to emphasize disciplined approaches to investing that could be clearly articulated and differentiated from others. Swensen and Takahashi were convinced that disciplined fundamental-based approaches, when intelligently applied, could generate reliable and superior long-run performance. There were, in addition, several small stock-picking firms among Yale's managers, firms that specialized in a very particular industry or type of investing—for example, a technology specialist fund, one specializing in North American oil-and-gas firms, and another that held only biotechnology stocks. Not surprisingly, none of Yale's managers tended to emphasize market timing, nor did they emphasize fuzzy or intuitive investment approaches that were difficult to articulate. The University's managers tended to be smaller independent organizations that were owned by their investment professionals. Other things being equal, Yale preferred managers willing to "co-invest" and to be compensated commensurate with their investment performance. Swensen and Takahashi worried that money managers working at many organizations tended to emphasize growth in assets at the expense of performance and that ownership by a large institution reduced organizational stability and dampened incentive to perform.

Foreign equities, another 15% of Endowment assets, were a valuable source of diversification, since their returns tended to be only partially correlated with those of the U.S. equity market. But Yale had encountered some real frustrations in transferring its model for successful domestic equity investing to foreign markets. First, the selection of appropriate active money managers had proven particularly challenging. The relatively slower development of institutional investing in many foreign countries meant that there were fewer sophisticated "U.S. style" money managers abroad, managers with credible audited investment performance records and specialized disciplined investment processes. Perhaps more critically, many leading foreign fund managers appeared to work for larger organizations that were in turn owned by large financial institutions, which raised concerns among Swensen and Takahashi about misaligned incentives. Unlike in the United States, there were very few independent investment advisers owned solely by their professionals. In spite of these problems, Yale had recently been successful in identifying and hiring investment managers based in London, Singapore, and Hong Kong and saw this as one of the near-term "bright spots" in its portfolio.

Senior Director Takahashi found the emerging equity markets of Asia, Latin America, and Eastern Europe particularly intriguing because of the widespread opportunities to find undervalued securities in these less efficient markets. By June 2003, roughly 6,500 companies were listed on emerging stock market exchanges, amounting to 21% of all listed companies in the world. While the market capitalization of these stocks represented 10% of the non-U.S. market capitalization, the economies of emerging markets amounted to more than 28% of non-U.S. GDP in dollar terms and roughly twice that amount when adjusted for purchasing power. In addition to attractive investment opportunities, emerging markets also provided portfolio diversification since their returns generally had low correlation with those of the United States. Furthermore, emerging markets were growing rapidly, at nearly twice the rate of developed countries. There were concerns, of course, including whether these growth prospects would translate into strong investment returns. Although the link between growth and profitability for the corporations of these countries was widely assumed, Takahashi was concerned that the link was weak at best. Nonetheless, he believed that the rapid rate of change in emerging markets provided opportunities for active managers to earn superior returns.

Takahashi believed that Yale's foreign equity portfolio should be heavily weighted toward emerging markets, but he was concerned with the limited universe of acceptable managers conducting research-intensive, fundamentally based analysis. Many of the top, successful global emerging markets funds had grown to have many billions of dollars of assets under management, making it difficult to deploy assets in smaller, less well-followed corporations. On the other hand, small funds often lacked the resources to research and cover the tremendous breadth of global emerging markets. Yale had seven emerging markets managers in its portfolio. One was a large U.S.-based value manager who used a blend of judgmental and quantitative analysis to allocate between countries and choose stocks. Another was a large, London-based global emerging markets manager who used bottom-up fundamental research to invest in a concentrated portfolio. Five were small regionally focused managers—one investing in Africa, one in Eastern Europe, one in Russia, and two in Southeast Asia—concentrating on intensively researched value plays.

Yale's emerging market portfolio had generated an annualized 7.4% return over the previous decade, 5.8% annually in excess of its benchmark.[10] Although Takahashi believed that such excess returns were not sustainable in the long run, he thought that emerging markets generally would continue to be less efficient and provide more opportunities for excess returns than developed markets. While the Investment Committee did not set a distinct target for emerging market equity holdings, it did so indirectly through the definition of a foreign equity benchmark. Currently, foreign equity returns were compared to a benchmark index that was comprised one-half of the Morgan Stanley Capital International (MSCI) Europe, Australasia, and Far East (EAFE) Index and one-half of the MSCI Emerging Markets Free Index. One issue for Yale was that positions in emerging market securities were held by managers other than those in the publicly traded foreign equity portfolio. For instance, some of Yale's absolute return managers held substantial positions in companies based in developing nations.

A final more diffuse category of publicly traded investments was called "absolute return" strategies, to which Yale currently allocated 25% of its assets. These included a variety of funds specializing in eclectic mixtures of strategies designed to exploit market inefficiencies. Yale divided these into two broad categories: event-driven and value-driven investments. Event-driven strategies generally involved creating hedged positions in mispriced securities and were dependent on a specific corporate event, such as a merger or bankruptcy settlement, to achieve targeted returns. Value-driven strategies also entailed hedged investments in mispriced securities, but relied on changing company fundamentals or increasing market awareness to drive prices toward fair value. The common denominator of these strategies was that their returns were expected to be equity-like, yet not highly correlated with any particular financial market. It consequently made sense to evaluate their investment performance in terms of the absolute returns achieved, rather than relative to any indices of market performance.

Yale's commitment to this asset class was tested in 1998, when many hedge funds suffered in the "flight to liquidity" that followed Russia's August 1998 default on its debt obligations. During this period, many expensive (but liquid) assets rose in price, and many cheap (illiquid) assets became cheaper. Even though some of these pricing anomalies were likely to be short-lived—e.g., Treasury bonds maturing in 29 years traded at a substantial discount to those maturing in 30 years—a number of investors panicked after the collapse of the Long-Term Capital Management fund and demanded the return of their capital. As a result, some funds were forced to liquidate positions at exceedingly unfavorable prices. While in most cases the University was insulated from the effects of other investors' sales because the fund managers had established separate accounts for Yale's investment,

[10] The benchmark used until 1999 was the International Finance Corporation (IFC) Global Emerging Index, and MSCI Emerging Markets Free Index thereafter.

in other cases, Yale's funds were commingled with other investors. In these instances, Yale's returns had suffered: the ill-timed selling decisions depressed the returns of all investors. As a result of this experience, Yale redoubled its efforts to utilize separate accounts that insulated Yale's investments from poorly timed acts of other investors. The University's use of its market power recalled steps that had been taken in the difficult fundraising environment that real estate funds faced after the early 1990s savings and loan crisis, when Yale obtained more attractive terms on its funds—for instance, insisting that its fund managers share in the capital gains only above a given rate-of-return (a "hurdle rate").

While the influx of money into hedge funds in the previous few years had certainly posed challenges, Yale was convinced that it would still succeed in this area. While the returns of certain sectors of the industry might suffer from such changes, these problems were far from universal. In particular, the fund influx might pose special challenges for funds concentrating on merger arbitrage and distress, since the pool of opportunities is relatively finite. For funds specializing in relative value plays, though, the influx of capital should not matter nearly as much, since the opportunities for investment were quite broad.

The Management of Private Equity

Domestic venture capital and buyout funds While Yale had been among the first universities to invest in private equity, entering into its first buyout partnership in 1973 and its first venture capital partnership in 1976, the pace of investing had dramatically increased over time. **Exhibit 8** summarizes the size of and returns from Yale's private equity portfolio.

Yale's private equity investment strategy was consistent with its overall investment philosophy. First, the Investments Office placed a premium on building long-term relationships with a limited number of premier organizations. More than 90% of Yale's portfolio was invested in multiple funds sponsored by the University's group of general partners. Yale's prestige, name, and long experience in private equity investing made it a very desirable client and allowed it to invest in some well-regarded funds that might otherwise have been closed.

Second, Yale emphasized private equity organizations that took a "value-added" approach to investing (the hallmark of the venture capital industry). Yale shied away from any funds that sought to generate the bulk of their returns from simply buying assets at attractive prices, refinancing them, and "flipping" them. Their philosophy was explicated in a discussion of buyout organizations: "While financial skill is a vital component of LBO investing, we seek firms that build fundamentally better businesses. Financial engineering skill is a commodity, readily available and cheaply priced. Value-added operational experience, however, is rare."[11]

Yale believed that value-added investors could generate incremental returns independent of how the broader markets were performing. In addition, such investors might also find better deals at cheaper prices, deals away from the auction process that others did not see. For instance, Clayton & Dubilier (where Yale served as limited partner) had purchased Lexmark International from IBM and Allison Engine from General Motors after establishing close relationships with those corporations. As a general rule, though, Yale was willing to give considerable latitude to its firms to define sensibly the types of private equity deals that they wanted to do.

[11] David F. Swensen, Dean J. Takahashi, and Timothy R. Sullivan, "Private Equity—Portfolio Review," memorandum to Investment Committee, September 29, 1994, p. 5.

Another key principle was to select organizations in which the incentives were properly aligned. For instance, Yale was reluctant to invest in private equity organizations affiliated with larger financial institutions. Such situations, the Investments Office believed, were fertile breeding grounds for conflicts-of-interest, or lack of incentives for the people actually doing the deals, or both. In addition, Yale preferred an overall structure for each of its funds such that the private equity firm could just cover its ongoing costs from the annual fees, earning essentially all of its economic returns from the "carry" tied directly to investment performance. This policy could at times be problematic: for instance, several of the most successful venture funds had dramatically increased their annual management fee income during the 1990s. While Yale would have liked to insist that the bulk of the compensation be linked to investment performance, in many cases it had been unable to persuade the venture partners to change the proposed compensation scheme. Some of these venture organizations were sufficiently attractive that the Investments Office decided to participate in their funds anyway. In other cases, because of fundamental changes in the private equity firm's investment strategy or organizational structure, Yale declined to participate.

When Yale's private equity portfolio was compared to those of other universities, three patterns stood out. First, Yale had traditionally had a considerably greater exposure to this area: in the latter half of the 1990s, Yale had a target allocation to private equity in excess of 20%, considerably more than other schools (see **Exhibits 2** and **3**). Second, Yale had a larger fraction of its holdings concentrated in the funds of top-flight firms. A third difference related to the composition of the private equity investments. In general, many funds could be categorized as either buyout or venture capital funds, though in the late 1990s the distinction between the two had become increasingly blurred as buyout funds increasingly purchased technology firms and even invested in start-up firms. The mixture of most major universities' endowments was heavily weighted towards venture capital funds, with the average large endowment (dollar-weighted) holding nearly three-fifths of its private equity investments in this asset class. In contrast, Yale had shifted over time: the proportion of the private equity portfolio in traditional venture capital had declined from 46% in June 1990 to 27% in June 1997 and then risen again (to 35% in June 2002). These shifts reflected not a changing policy objective, but rather were the result of both factors within Yale's control—e.g., "bottom up" assessments of which individual funds offered the highest returns—and factors outside Yale's control—e.g., drawdown schedules of private equity managers.

Yale had recently lowered its target allocation to private equity to 17.5%. This decision reflected several considerations. First, beginning in 2000, its actual holdings in private equity had fallen rapidly. The shrinkage initially reflected many funds distributing shares in successful IPOs in 2000, and then firms rapidly writing down unsuccessful investments. Moreover, fundraising by the premier groups that Yale typically invested in fell rapidly after 2000: many groups reduced the size of existing funds and sharply slowed their investment rates as they grappled with the troubled firms in their portfolio. (**Exhibit 9** summarizes the inflow into private equity over the past two decades.) Many of the groups that had returned to the market raised far smaller funds than those they had raised in 1999 and 2000. While some members of the Investment Committee felt that the 25% target should be retained, by mid-2002 the Investment Committee reached a consensus that a lower target better reflected the current environment.

At the same time, Swensen and Takahashi believed that Yale should stay committed to private equity for two reasons. First, from its inception in 1973 to June 2002, Yale's private equity portfolio had delivered an annual rate of return of over 31% (with a standard deviation of returns over the past 25 years of 55%). Second, over its nearly 30 years of investing, Yale had developed a deep understanding of the process and strong relationships with key managers, which served as an important competitive advantage. An important aspect of this advantage was the continuity of the

team managing the private equity program. Swensen, Takahashi, and Director Timothy Sullivan had worked together on the portfolio for more than a decade and a half.

Another substantial question was whether the same groups would succeed in future years. Private equity had been subject to a boom-and-bust cycle since at least the 1960s, with high returns attracting new investors, who flooded money into the sector until returns deteriorated, whereupon they withdrew. But the unprecedented growth of the private equity industry appeared to have changed the industry in some permanent ways. First was the scale at which private equity groups operated. These concerns were particularly acute on the buyout side, where multibillion dollar funds had become the norm. The Investments Office was concerned that these groups would pursue low-risk, low-return transactions, in order to ensure their ability to raise a follow-on fund (with the substantial associated fees), rather than following innovative strategies that had the potential of generating higher returns. As Tim Sullivan noted, "many LBO firms appear to have explicitly lowered their return hurdles in order to compete for transactions, particularly at the larger end of the market, pricing deals to yield returns in the mid-to-high teens."[12] As a consequence, some of these large funds had experienced defections of key personnel who sought to begin new funds of their own. When investing in middle-market buyout groups, Yale often found itself becoming progressively more uncomfortable as the groups raised larger and larger sums. More generally, Yale noted with concern that a number of leading buyout groups were positioning themselves as "asset managers"—for instance, raising absolute return, venture capital, mezzanine, and real estate funds in addition to their core buyout funds. Sullivan worried that such moves would profoundly affect the incentives of the private equity organizations, as they lowered their return expectations and made excessively safe investments. In the most extreme manifestation of this phenomenon, private equity groups such as Thomas H. Lee Co. and Warburg, Pincus had sold stakes in themselves to other asset managers. Yale feared that such transactions, while financially attractive to the private equity groups' founders, would lead to conflicts of interest between the private equity investment activity and the other asset management businesses.[13] The second major change involved the new classes of investors active in the industry. Despite the downturn in the returns, numerous overseas institutions and state pension funds seemed to have a voracious appetite for private equity. Many of these investments seemed to be made in a very undisciplined manner, as inexperienced investors backed virtually every group that would accept a substantial check. The presence of these newcomers suggested that intense price competition would continue to affect the private equity industry in the years to come.

Nonetheless, Yale hoped that it could continue to realize attractive returns from this asset class, just as it had during the 1980s and 1990s. First, the Investments Office noted, the deterioration of performance in the 1990s had been far from uniform across firms. While very poor returns characterized some new "spin-off" organizations as well as some established organizations that had grown in an undisciplined manner, many of the funds managed by top-tier private equity organizations had continued to generate superior returns. Because Yale had concentrated its portfolio in several of these funds, such as those organized by Bain Capital, Berkshire Partners, Greylock, and Kleiner Perkins, the University believed its private equity managers would produce superior performance, even in a difficult environment for private equity.

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[12] David F. Swensen, Dean J. Takahashi, Timothy R. Sullvan, Alan S. Forman, and Seth D. Alexander, "Private Equity—Portfolio Review," October 7, 1999, p. 15.

[13] On the venture capital side, the Investments Office was concerned about the plethora of venture organizations that were planning to raise very large funds, even if smaller than the billion dollars funds of few years back. While the Investments Office was aware that many venture investors were convinced that the "minimum efficient scale" of a venture capital organization had increased, they were again concerned about the incentive effects of the increase in fee income.

Second, Yale had a considerable understanding of the private equity process, which allowed it to manage investments in sophisticated ways. One example of Yale's innovative management was the hedging of its positions. Yale carefully tracked the holdings of the private equity firms in which it invested.[14] When it believed that it had too large an exposure to any particular publicly traded firm, it sought to hedge that exposure through short sales and derivatives. Short sales and put options would generate offsetting profits if the share price declined. This effectively helped to reduce the danger of a severe drop in the public market wiping out the gains of a private equity investment. This hedging strategy had allowed Yale to receive a higher return from its early 1990s investment in Snapple, which declined substantially between its peak 14 months after it was taken public and the liquidation of Thomas H. Lee Equity Partners' position. Moreover, this hedging allowed Yale to continue to invest in promising private equity funds during the boom period of the late 1990s: had the University not reduced its overall exposure through hedging, the exposure would have been so far above target that the Investments Office could not in good conscience have continued to make new commitments.

Finally, there were important benefits to being in the private equity market at all times. If Yale were to decide not to invest with a top-tier firm merely because the market was "overheated," it might not be able to persuade the organization to accept its money when later market conditions were more favorable. As Tim Sullivan concluded, if Yale were to alter its steady commitment to private equity and seek to time the market, top-tier firms "would not want Yale's unreliable money."[15]

This confidence was borne out by an analysis of Yale's venture capital returns. The Investments Office found that it had enjoyed its highest returns from the groups where it was strictly rationed in terms of how much it could invest; put another way, the clubs where it was hardest to get in truly were the best! This pattern held whether the Endowment looked at large funds or small funds. While Yale had made numerous investments into less well-known funds in hopes of backing the "leaders of tomorrow," these had generated more mixed results. While a few funds had generated superior returns, the overall level of performance trailed the established funds in Yale's portfolio and "few of these firms have become consistent members of Yale's roster of active managers."[16]

International private equity funds An area of continuing interest was international private equity. While Yale's initial strategy had been concentrated on the United Kingdom and France (at the end of 1995 nearly half its foreign investments had been based there), it had also explored developing markets. One noteworthy characteristic was Yale's avoidance of the developing countries of Asia, which represented the largest single share[17] of many large institutions' international private equity portfolios during much of the 1990s.

[14] Private equity organizations typically do not sell the shares of firms in their portfolios at the time they go public. They generally promise the underwriter to continue to hold them for a period of months (often termed the "lock-up" period). Many will continue to hold shares after the lock-up period expires, if they believe the shares will appreciate further.

[15] David F. Swensen, Dean J. Takahashi, and Timothy R. Sullivan, "Private Equity—Venture Capital Strategy," memorandum to the Investment Committee, March 4, 1992, p. 7.

[16] David F. Swensen, Dean J. Takahashi, Timothy R. Sullivan, Seth D. Alexander, and Robert F. Wallace, "Private Equity—Venture Capital Decision Making Assessment," memorandum to the Investment Committee, May 22, 2003, p. 17.

[17] For instance, Asia represented 35% of all non-U.S. private equity commitments by major institutional investors in 1995. In light of disappointing returns, this share had fallen to 16% by 2001. Goldman, Sachs & Co. and Frank Russell Capital, Inc. *2001 Report on Alternative Investing by Tax-Exempt Organizations*, November 2001.

The Investments Office's move into international private equity had been the consequence of a cautious planning process. As the U.S. market became increasingly competitive, Yale paid more attention to overseas markets where far fewer funds were competing for deals, suggesting the possibility of more attractive valuations. While many other institutional investors saw international private equity as particularly promising, Yale eschewed the typical strategy of investing in large funds devoted to buyouts in Europe and Asia. This reflected several considerations. First, many of the leading foreign private equity investors were subsidiaries or affiliates of large financial institutions. As discussed above, Tim Sullivan was concerned that such situations were rife with compensation and conflict-of-interest problems. Second, the Investments Office often found it quite difficult to evaluate foreign private equity organizations. In most countries, Yale lacked the strong network of relationships that it could rely upon in the United States to assess the quality of potential new partners. A possible alternative was to invest in a number of the new very large "global private equity" funds that were being sponsored by established and well-regarded U.S. firms. Sullivan liked some of these firms and approved of their incentive structures, but he was a little troubled by the U.S. firms' obvious lack of experience and track records in these very different foreign markets. The managers of these global funds suggested that they could and should become the solution for Yale's problems, but Sullivan was unconvinced.

At the same time, international private equity investing carried real risks, as Yale's experience in Eastern Europe illustrated. Yale had made a small initial investment in a Russian "quasi-private equity" fund, which took stakes in both thinly traded public corporations and smaller private firms. As the fund family enjoyed spectacular successes in the mid-1990s, Yale took a significant amount of money off the table, but reinvested a considerable share of its gains. This fund family experienced sharply negative returns after the Russian debt crisis of 1998. Overall, the Eastern Bloc investment yielded Yale an annualized return in the mid 20% range—but in a strikingly uneven manner that was not for the faint of heart!

There were also private equity funds being raised to invest in Latin America and in Southeast and Southern Asia. Yale had been able to identify a number of these emerging market funds that were managed by general partners that seemed attractive by normal standards: small entrepreneurial firms, with operational experience on the ground in these emerging markets, some co-investment and/or incentive fees, and an apparently keen sense of where upside opportunities might lie. And it was tempting to participate in some of these funds, as a very long-term contrarian bet if nothing else. But the problems of evaluating and selecting managers were challenging here, perhaps more severe than in almost any other asset class.

The Management of Real Assets

Another important class was real assets, which included real estate, oil-and-gas, and timberland investments. The Investments Office believed that properly managed real estate provided an interesting set of investment opportunities. The returns from real property tended to be uncorrelated with those from marketable common stock and, in the long run, real property might produce returns protected from inflation. Most importantly, though, real estate was a quite inefficient, cyclical market where Yale might well be able to generate very attractive returns if it could find the right managers with the right strategies and the right incentive structures. As in other asset classes, Yale concentrated on pure equity investments, avoiding mortgages and other debt. The Investments Office shunned managers who were just financial advisors who might buy existing buildings with stable rent rolls and apply a little financial engineering. Instead, the Office sought to establish relationships with real estate operators who had a competitive advantage, either by property type or market, and preferably with a focus on an out-of-favor sector.

Historically, Yale's real estate portfolio had consisted primarily of a single Manhattan office building at 717 Fifth Avenue, a direct investment that had been singled out and recommended by a group of alumni in the 1970s. The property, which was located at the corner of 56th Street and for many years had featured the Steuben Glass showroom, performed very well. Yale paid $14 million for a 50% interest in 1978 and $47 million for the remaining 50% in 1994.

In spite of the strong performance, the challenges in managing 717 Fifth Avenue came to reinforce Yale's strong preference for external management of Endowment assets. When Steuben Glass announced its intention to vacate its Fifth Avenue retail space to move to a Madison Avenue location, Yale Real Estate Director Alan Forman quickly discovered first-hand the near impossibility of engaging an agent with an owner's mentality. He subsequently devoted a significant amount of his time to finding suitable replacement tenants—Hugo Boss and Escada—and supervising a major construction project to accommodate their needs.

Ultimately, Yale's October 2002 sale of 717 Fifth Avenue generated spectacular results. The sales price of $611 per square foot represented one of the highest prices ever paid for an arm's-length sale of a Manhattan office property. Over the 24-year holding period, Yale realized a 19.3% per annum return on its investment.

During the late 1980s, Yale had been substantially underweighted in real estate because it could not identify enough attractive investment opportunities in the market during that period. But beginning around 1990, Yale came to believe that the decline in asset values associated with the savings and loan crisis had created a compelling opportunity. Accordingly, the Investments Office began increasing its real estate investments.

Many institutional investors, having been severely burned, were still wary if not totally dismissive of this asset class. Yale's strategy was to focus on deliberately contrarian segments of the real estate market where most other investors feared to tread. They sought out partners who targeted distressed sellers and who possessed the operating expertise to implement value-added strategies that could realize substantial returns over the medium term. For example, Yale engaged managers to buy (1) downtown and suburban office buildings from insurance companies facing financial pressures or banks that had foreclosed; (2) close-in developable land, a highly illiquid property type, especially in a capital-constrained environment; or (3) strip shopping centers that needed a reconfiguration or a redirected marketing effort.

Perhaps predictably, though, Yale had encountered some interesting challenges in implementing this real estate strategy. First, Yale felt that the institutional real estate industry was dominated by firms that were compensated through transaction fees or fees based upon assets under management, rather than by sharing in the profits generated for their investors. These firms thus had every incentive to keep their investors' capital tied up over long periods of time, leading to asset accumulation and retention, rather than generation of superior investment returns. (During the early 1980s, the Endowment had invested a small amount of money in a number of pools managed by well-known real estate advisors, many of which had performed rather poorly.) Because of these factors, Yale had decided not to deal with the established group of institutional real estate advisors. Luckily, the collapse of the real estate market had provided the Investments Office with an opportunity to find some new firms that might be hungry for funds, and might consequently be willing to accept new kinds of incentive structures. From Yale's perspective, the Investments Office wanted to borrow ideas from, and improve upon, the incentive structures typical in private equity funds. In particular, they wanted all the real estate principals' activities to be focused on one pool at a time, they wanted the principals to make a significant cash investment in the pool (sometimes called co-investment), they preferred an intermediate term strategy for the pool (after which they might or

might not invest in a later pool), and they wanted most of the principals' compensation to come at the end of the fund and to be linked to investors' returns.

Over time, working their networks, the Investments Office staff had been able to find a number of independent firms with excellent real estate operating skills, which were eager to forge this kind of relationship. But most of these firms were not well known, even by knowledgeable real estate investors. Unlike in private equity, where Yale participated in funds considered to be the premier institutional funds, few people knew or even recognized the names of most of their real estate funds. Yale was often the lead investor in these funds, with a sizable percentage of the limited partnership interest. Although it had proven difficult to expand the size of the total real estate portfolio very quickly this way, Yale had gradually built a portfolio. While it would have been much easier, of course, to use some of the larger better-known institutional real estate advisors to expand the real estate portfolio quickly, this would surely have meant compromising on Yale's desired strategy and incentive structures—compromises with which the Investments Office was not comfortable.

The other side of the real assets portfolio was the oil-and-gas and timberland partnerships. In some ways, this market remained an attractive one. A substantial supply of energy properties had come to market in recent years, as major oil companies downsized and smaller firms consolidated. While some independent firms had been able to raise capital from the public marketplace, the supply of institutional money for such properties remained relatively limited. Timberland was in an even earlier stage of development, having been added to the portfolios of relatively few institutional investors. Large forest products companies were under considerable pressure to sell forestland to enhance shareholder value.

It was difficult, however, to find well-designed oil-and-gas partnerships led by attractive managers. Much of the partnership-raising business appeared to be in the hands of agents, who were compensated primarily on the basis of arranging deals. In addition, there were quite a few operators who seemed to get rich, even if their clients did not. Furthermore, assessing the skills of the general partners in these funds was often difficult. In many cases, individuals raised funds on the basis of their participation in earlier successful partnerships. But it was generally very difficult for the Investments Office to determine which partner had been responsible for a key discovery or production success.[18] Yale's general impression was that investment opportunities and partnerships with sterling track records, unblemished reputations, and proper deal structures were quite uncommon in the oil-and-gas industry.

As a result, Yale's investments in oil-and-gas tended to emphasize two different investment models. The first focused on partnerships in the business of acquiring existing oil fields and enhancing their operations. In contrast to the high-risk world of exploration, it was somewhat easier to assess performance and responsibility here. Furthermore, the long-term assets provided relatively predictable income and protection from energy-related inflation. The other approach applied a private equity investment model whereby Yale invested in partnerships pursuing equity investments in oil-and-gas and energy service companies.

Forestland was another attractive area for future exploration. Yale had invested in two partnerships focused on sustainable harvesting of softwood and hardwood forestland in the United States. Yale Investments Director Seth Alexander believed that the conventional assessment of natural resource funds did not fully capture the fact that they offered a steady stream of inflation-sensitive payments in addition to the potential to add value through active management, making such investments far more attractive than commodity indexes. Recent timberland investments were

[18] This was in contrast to venture or buyout investing, where individual partners' successes and failures could be more or less assessed by examining who represented the partnership as a director on various firms' boards.

acquired at substantial discounts to the standing value of the timber that offered projected low double-digit returns assuming that prices remained stable. This seeming anomaly was due to two factors. First, overlevered timber companies were being forced by fiscal pressures to sell assets at attractive prices. Second, forestland had not traditionally been managed to maximize the rate of return, which created good opportunities for sophisticated operators. This appeared to be a ripe area for further expansion in the years to come; however, the opportunity to acquire attractively priced timberland might be fleeting.

By mid-2003, the Endowment had more than 20% of its assets invested in real assets, just above the target allocation of 20%. On the one hand, Investment Office staff were pleased because real estate performance had been strong, outpacing substantially the NCREIF Property Index (NPI). The incentive structures put in place with their real estate managers a few years earlier were providing a powerful motivation to maximize returns through property sales. Moreover, 10-year performance of 15.3% indicated that Yale's allocation to real estate had served the Endowment well over a long period of time. The 26.2% 10-year return of Yale's oil-and-gas portfolio validated the University's strategy of partnering with operations-focused, value-added firms. While the early returns on Yale's timber portfolio were promising, the true success of the program would become apparent only with the passage of time.

Even with an actual allocation for real assets near the target level, the Investments Office worried about the future allocation to the asset class. Because the University's managers found only occasional attractive investment opportunities, large commitments to real estate, oil and gas, and timber funds remained undrawn. The staff worried that the real assets portfolio might not be large enough to serve the needs of the Endowment as a whole. Swensen had gained comfort in the past from Yale's substantial real assets allocation, which might provide protection in the event of a significant further downturn in the U.S. stock market, and worried about the adequacy of the portfolio's projected size.

Future Directions

In July 2003, Swensen and Takahashi believed that they probably wanted to continue with a heavy weighting in what they viewed as less efficient markets. On the other hand, were private investments, which had been so important in contributing to Yale's superior returns over the years, still attractive in a market flooded with capital? How should Yale allocate its new commitments in this overheated environment? In particular, how should the new investments be allocated across venture, buyout, international, real estate, and natural resource funds? What should be the mix between new groups and established organizations? Should Yale expand its international program to include a greater emphasis on Asia and continental Europe?

Looking beyond the short run, Swensen and Takahashi wondered about the risks and challenges that the coming years would pose to the Yale Endowment. Over the past few years, the fraction of traditional publicly traded securities in Yale's Endowment fell below 40% for the first time. This seemed like an important transition. Just how far could such securities—and fixed income in particular—be reduced? At some point, should they begin to worry seriously about issues of decreasing portfolio liquidity, and the increasing difficulty in determining precise valuations for the Endowment?[19] Similarly, should they worry about the implications of this evolution for staffing? Should they worry about the fact that an increasing fraction of the portfolio did not really have meaningful benchmarks against which they could reliably measure their managers, themselves, and

[19] For example, valuation issues arise in terms of the estimates used in the spending rule, which had originally assumed tha market prices would be available to value the assets.

the success of their strategies? The feedback in these asset classes came only in the very long term, perhaps too long for most individuals' decision horizons. In the long run, how should they think about the issues of risk? Would it really be true that private markets offered greater returns? In the long run, would it be viable for Yale to adopt an asset allocation that was considerably different from that of its closest peers, such as Harvard, Princeton, and Stanford? More generally, could these few Endowments as a group persist with asset allocations that were very different from those of almost every other institutional investor?

Exhibit 1 Asset Allocations of Yale Endowment, 1985–2002

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Current (2003) Target Allocation
Domestic equity	61.6%	63.5%	61.7%	56.8%	53.2%	48.0%	30.7%	27.5%	23.9%	21.2%	21.8%	22.6%	21.5%	19.2%	15.1%	14.2%	15.5%	15.4%	15.0%
Foreign equity	6.3	8.6	10.8	14.0	15.4	15.2	14.8	15.3	16.5	14.6	12.5	12.4	12.8	12.1	11.1	9.0	10.6	12.8	15.0
Bonds	10.3	12.7	14.6	15.0	16.3	21.2	21.2	22.7	22.5	16.5	12.2	12.3	12.5	10.1	9.6	9.4	9.8	10.0	7.5
Cash	10.1	5.0	2.1	2.1	0.3	0.9	0.9	0.5	0.1	0.6	1.8	0.9	-0.2	-2.5	1.5	8.1	6.2	0.3	0.0
Real assets	8.5	7.5	7.2	7.7	8.7	8.0	7.9	7.1	6.0	8.6	13.5	11.2	11.5	13.0	17.9	14.9	16.8	20.5	20.0
Private equity	3.2	2.7	3.6	4.4	6.1	6.7	8.3	10.4	14.4	18.1	17.2	20.2	18.6	21.0	23.0	25.0	18.2	14.4	17.5
Absolute return	0.0	0.0	0.0	0.0	0.0	0.0	15.9	16.5	16.6	20.1	21.0	20.7	23.3	27.1	21.8	19.5	22.9	26.5	25.0

Source: Yale University documents.

Notes: Asset allocations are on June 30 of each year.

Private equity includes venture capital, and buyouts (and oil and gas and forestland through 1998).

Absolute return includes hedge funds, high-yield bonds, distressed securities, and event arbitrage.

Real assets includes real estate and (since 1999) oil and gas and forestland.

Exhibit 2 Asset Allocations of Large University Endowments, 1985–2002

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Domestic equity	51.5%	52.1%	53.8%	50.2%	46.1%	45.3%	43.5%	44.4%	43.0%	41.6%	42.8%	41.1%	42.3%	39.9%	36.3%	36.5%	30.1%	29.3%
Foreign equity	2.0	2.6	3.0	5.2	6.6	6.6	7.8	8.1	10.2	14.3	15.2	14.0	15.9	14.7	14.5	15.0	13.9	14.3
Bonds	26.4	28.3	26.0	26.2	27.5	29.2	30.2	30.7	26.9	22.4	17.5	20.1	18.0	15.9	15.0	17.4	17.8	23.1
Cash	10.8	8.8	8.9	7.7	6.9	6.9	6.1	5.2	4.6	3.2	4.1	3.2	3.1	2.5	3.0	2.8	2.5	-0.2
Real estate	4.8	4.9	5.2	4.3	5.1	4.4	4.2	3.7	3.7	4.2	5.1	5.2	5.2	6.9	6.6	4.7	6.3	5.9
Private equity	2.7	1.9	2.0	5.8	6.6	6.2	6.2	5.9	6.6	7.7	8.0	8.1	7.2	8.2	11.1	13.9	12.1	9.9
Absolute return	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.8	3.3	5.2	6.2	6.7	6.9	10.1	11.3	8.3	13.2	14.7
Other	1.8	1.4	1.1	0.6	1.2	1.3	1.4	1.2	1.7	1.5	1.1	1.6	1.5	2.0	2.1	1.2	4.1	3.1

Source: Compiled from National Association of College and University Business Officers, *2002 NACUBO Endowment Study*, Washington, National Association of College and University Business Officers, 2003 (and earlier years).

Notes: Asset allocations are on June 30 of each year.

Large funds are defined as those with more than $1 billion in assets in 1998 through 2002, as those with more than $400 million in assets in 1988 through 1997, and as those with more than $200 million in assets in 1985 through 1987.

Private equity includes venture capital, buyouts, and oil and gas.

Funds are weighted equally in calculating average allocations in 1985 through 1987.

Absolute return includes hedge funds, high-yield bonds, distressed securities, and event arbitrage.

Funds are weighted by size in calculating average allocations in 1988 through 1994.

1985–1987 classifications may not be completely analogous to those in other years.

Exhibit 3 Asset Allocations of All University Endowments, 1985–2002

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Domestic equity	46.1%	48.7%	51.4%	46.4%	48.5%	48.1%	47.1%	47.1%	48.5%	47.2%	49.2%	51.6%	52.6%	52.4%	53.7%	41.4%	49.5%	47.3%
Foreign equity	0.8	1.1	1.6	1.5	1.8	2.4	2.4	3.2	4.2	7.5	9.5	9.5	11.2	11.0	10.6	14.1	9.9	10.1
Bonds	30.6	30.6	30.8	33.8	32.2	33.9	35.3	35.3	34.4	32.2	28.3	27.3	25.2	24.9	23.1	21.1	24.9	26.9
Cash	14.5	13.1	12.6	14.2	13.0	10.9	10.1	9.9	7.6	7.1	6.5	5.4	4.8	4.1	4.0	3.5	4.1	3.9
Real estate	4.2	3.9	2.2	2.5	2.7	2.9	2.9	2.3	2.1	2.1	2.3	2.0	2.0	2.2	2.1	3.0	2.4	2.7
Private equity	0.7	0.6	0.7	0.9	1.1	1.0	1.1	0.9	1.1	1.2	1.3	1.4	1.4	1.4	2.2	8.7	2.6	2.4
Absolute return	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	1.1	1.8	2.0	2.2	2.4	3.6	3.8	7.0	4.2	5.1
Other	3.1	2.0	0.7	0.6	0.7	0.7	0.9	1.0	0.9	0.9	0.9	0.5	0.4	0.4	0.5	1.1	2.3	1.6

Source: Compiled from National Association of College and University Business Officers, *2002 NACUBO Endowment Study*, Washington, National Association of College and University Business Officers, 2003 (and earlier years).

Notes: Asset allocations are on June 30 of each year.

Private equity includes venture capital, buyouts, and oil and gas.

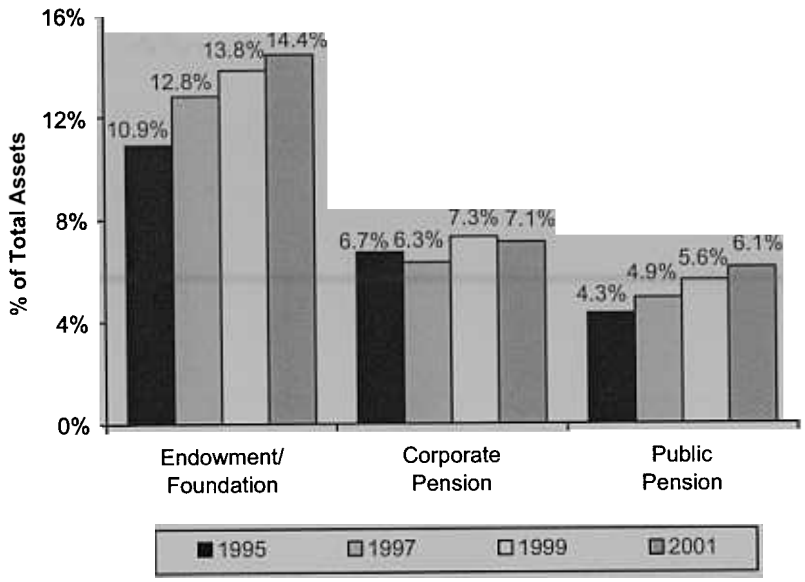
Absolute return includes hedge funds, high-yield bonds, distressed securities, and event arbitrage.

All funds are weighted equally in calculating average allocations.

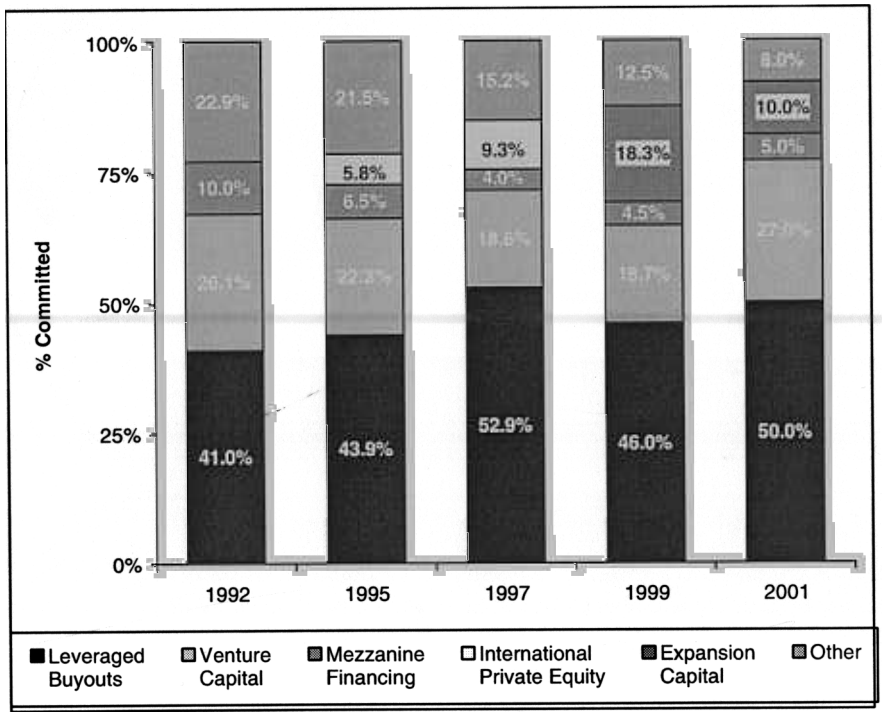
1985 and 1986 classifications may not be completely analogous to those in other years.

Exhibit 4 Asset Allocations of Major Pension Funds and Endowments, 1992–2001

TOTAL ALLOCATION TO PRIVATE EQUITY



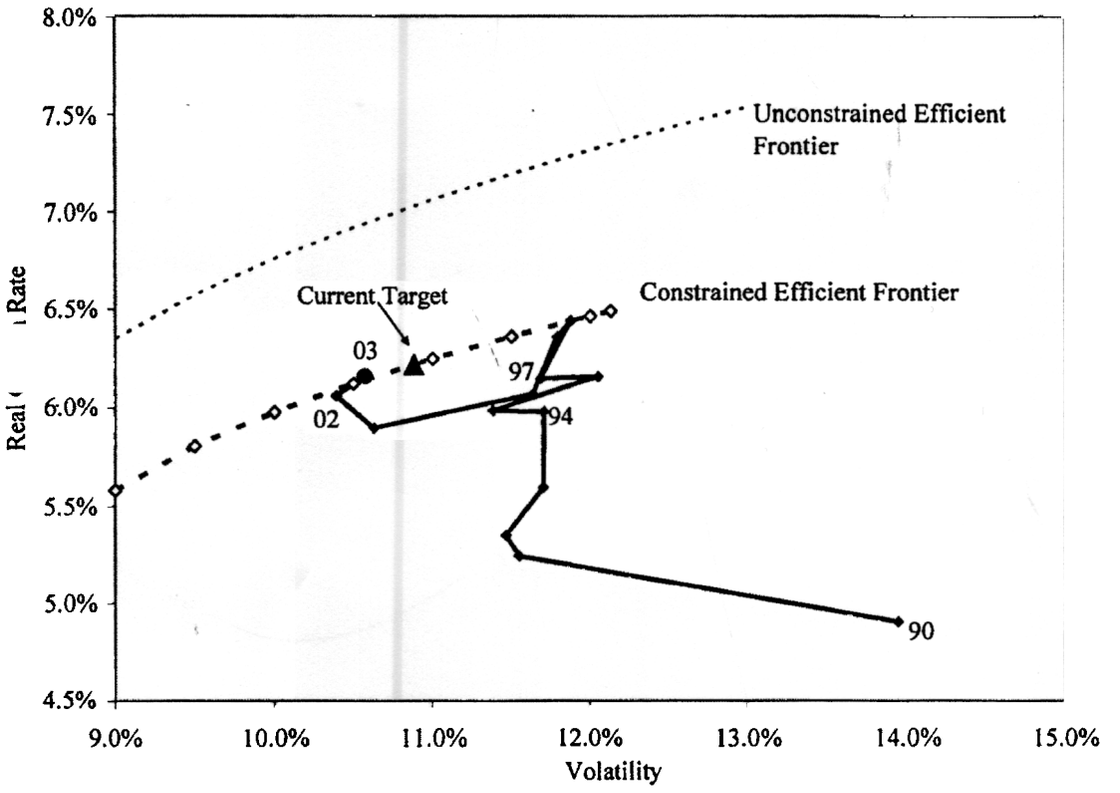
PRIVATE EQUITY ALLOCATION, BY SUB-CLASS



Source: Goldman, Sachs & Co. and Frank Russell Capital Inc., *2001 Report on Alternative Investments by Tax-Exempt Organizations*, November 2001.

Note: 2001 computation is only for North American-based institutions. In the allocation by subclass, international private equity is reported as a distinct class only between 1992 and 1997.

Exhibit 5 Yale's Historical Risk and Return Profile



Source: University documents.

Exhibit 6 Returns of All University Endowments, Yale Endowment, and Benchmark Indexes, Fiscal Years 1980–2002 (%)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Annualized 1980–2002 Return
Equal-weighted mean	12.6	14.7	-0.2	40.9	-2.5	25.4	26.3	13.9	1.4	13.9	10.0	7.3	13.3	13.4	2.9	15.7	17.3	20.5	18.0	11.0	13.0	-3.6	-6.0	12.0
Dollar-weighted mean	NA	NA	NA	46.0	-2.9	26.1	30.3	16.6	1.1	14.9	10.9	6.2	14.1	14.5	4.4	16.9	20.6	21.7	18.6	11.9	23.8	-2.7	-4.2	NA
Yale	18.7	22.7	-4.5	50.1	-0.2	25.8	36.0	22.8	-0.2	17.3	13.1	2.1	13.2	17.3	12.0	15.7	25.7	21.8	18.0	12.2	41.0	9.2	0.7	16.2
S&P 500	17.0	20.4	-11.5	60.9	-4.8	30.7	35.6	25.1	7.0	20.5	16.5	7.4	13.5	13.6	1.4	26.0	26.0	34.7	30.2	22.8	7.2	14.8	18.0	13.9
Wilshire 5000	19.2	25.2	-15.0	66.5	-8.7	31.2	35.3	20.1	5.9	19.5	12.8	7.0	13.9	16.6	1.2	24.7	26.2	29.3	28.9	19.6	9.5	15.3	-16.6	13.4
Long-term bond index	7.3	1.6	14.0	24.9	2.9	26.8	20.4	4.1	7.2	12.1	7.1	10.1	15.5	15.8	1.3	12.1	4.5	7.4	11.3	3.0	5.0	10.3	8.8	9.7
Consumer price index	14.4	9.6	7.	2.6	4.2	3.8	1.8	3.7	4.0	5.2	4.7	4.7	3.1	3.0	2.5	3.0	2.8	2.3	1.7	2.0	3.7	3.2	1.1	4.0

Source: Compiled from National Association of College and University Business Officers, *2002 NACUBO Endowment Study*, Washington, National Association of College and University Business Officers, 2003 (and earlier years).

Notes: Fiscal years end on June 30 of each year.

The first two averages include Endowments that report returns net and gross of fees.

No data on dollar-weighted mean or net-of-fee equal-weighted mean returns are available for 1980 through 1982 and 2000 through 2002 (for net-of-fee returns only). Annualized returns are computed for shorter periods.

Yale's returns are reported net of fees.

Exhibit 7 Returns of Yale Endowment, by Asset Class

Asset Class	Yale 2002 Return	Target Benchmark	Benchmark 2002 Return	Yale vs. Benchmark	Yale 3-Year Annualized	vs. Benchmark	Yale 10-Year Annualized	vs. Benchmark
Domestic equity	-6.4	Wilshire 5000	-16.6	10.2	11.5	19.7	16.9	5.9
Foreign equity	11.9	Foreign composite	-3.8	15.7	5.1	10.9	9.4	4.7
Fixed income	8.5	LB	8.8	-0.3	8.5	0.5	8.2	0.9
Real assets[a]	9.5	HEPI + 6%	10.1	-0.5	14.1	3.8	15.3	6.7
Private equity	-23.3	HEPI + 10%	14.1	-37.5	49.3	35.1	36.9	23.1
Absolute return	7.3	HEPI +8%	12.1	-4.8	14.7	2.2	12.1	0.3
Total Endowment	0.7	Composite benchmark	6.4	-5.7	15.7	8.2	16.9	5.7

Source: University documents.

[a]This includes only Real Estate prior to June 30, 1999.

Notes: All returns are net of management fees.

Returns are for periods ending June 30, 2002.

LB = Lehman Brothers U.S. Treasury Index.

HEPI = Higher Education Price Index.

The total benchmark return is calculated using Yale's target allocations. In June 2003, Yale's Investment Committee agreed to alter its benchmarks. For instance, private equity would be compared to a composite of Cambridge Associates private equity indices and a 10% real return.

Exhibit 8 Returns and Size of Private Equity Investments of the Yale Endowment, 1978–2002

Fiscal Year	Venture	LBO	Int'l	Total	Portfolio Value	Endowment Value
1978	27.2%	35.3%	NA	33.9%	3.2	545
1979	-2.2	-3.0	NA	-2.8	3.4	578
1980	208.1	231.9	NA	225.5	8.4	669
1981	33.3	-16.6	NA	-0.5	15.6	793
1982	25.6	-47.5	NA	-2.2	19.3	741
1983	123.4	-10.1	NA	91.4	38.6	1,089
1984	3.7	41.6	NA	9.2	37.3	1,061
1985	-10.1	5.6	NA	-5.0	42.0	1,083
1986	2.6	34.0	NA	15.8	46.9	1,739
1987	25.4	23.9	NA	24.3	75.7	2,098
1988	-0.7	7.3	-1.9%	3.3	91.0	2,044
1989	-0.3	38.7	13.4	23.4	120.7	2,336
1990	15.6	7.8	-4.4	11.8	173.7	2,571
1991	11.6	14.7	-10.0	6.1	226.8	2,567
1992	28.3	7.2	4.1	14.6	294.2	2,833
1993	13.6	57.3	-0.2	32.3	464.9	3,219
1994	20.2	18.7	24.0	24.6	640.6	3,529
1995	37.8	26.3	13.1	27.0	682.4	3,390
1996	124.8	30.9	33.7	60.2	896.6	4,860
1997	37.6	22.3	90.2	36.2	1,125.6	5,790
1998	38.5	46.4	1.9	29.0	1,382.8	6,624
1999	133.9	24.8	-15.4	37.8	1,993.6	7,199
2000	701.0	35.1	38.3	168.5	2,513.7	10,085
2001	9.0	-14.7	-3.9	-5.4	1,943.0	10,725
2002	-39.9	-11.2	-0.7	-23.3	1,492.0	10,524
Three-year	256.0	0.5	12.6	49.3		
Five-year	107.4	8.4	2.9	39.4		
Ten-year	53.5	18.9	18.0	36.9		
Since Inception	35.3	21.6	15.7	31.4		
Venture Economics Benchmark Return	17.6	13.9	11.9			
2002 Share in Yale Portfolio	35.1	54.9	9.9			

Source: Compiled from Venture Economics, *VentureXpert Database*, <http://www.ventureeconomics.com>, and university documents.

Notes: Returns are for year ending June 30 of each year. Value of private equity portfolio and Endowment are as of June 30, and are expressed in millions of dollars.

NA indicates that Yale had no investments in the asset class during that year, or that the investments were not classified as private equity.

The Yale fiscal year returns are internal rates of return calculated on a daily basis. Multi-year returns are based on internal rates of return using quarterly data.

"Venture Economics Benchmark Return" is the pooled internal rate of return from inception until June 30, 2002 for all funds of each type in the Venture Economics database. The international compilation only includes European funds.

"2002 Share in Yale Portfolio" refers to the share of Yale private equity portfolio devoted to this subclass on June 30, 2002.

Exhibit 9 Private Equity Fundraising, by Fund Type, 1980–2002

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Venture capital	0.6	0.9	1.3	2.6	3.4	2.1	2.1	3.7	3.1	3.3	1.9	.4	2.6	2.9	4.2	4.7	6.6	6.1	19.0	35.6	73.9	37.3	7.7
Buyouts/ Corporate Finance	0.1	0.1	0.4	0.6	1.5	1.1	4.3	9.6	7.9	8.8	4.6	4.3	6.7	8.2	13.2	19.0	22.8	19.1	57.2	39.0	74.5	56.7	36.2
Mezzanine	0.0	0.1	0.0	0.8	0.2	0.8	2.4	4.1	1.7	2.6	1.2	1.7	0.8	0.5	1.2	2.4	1.4	2.7	2.8	4.3	5.4	4.7	2.1
Other	0.0	0.0	0.1	0.2	0.0	0.3	0.2	0.1	0.4	0.2	0.2	0.3	0.6	1.2	0.8	2.2	1.3	3.3	13.1	16.6	2.3	16.1	8.9
Total	0.7	1.1	1.8	2.4	5.1	4.3	9.0	17.5	13.1	14.9	6.9	7.7	10.7	12.8	19.4	28.4	32.1	31.3	92.2	95.5	174.1	114.7	54.9

Source: Compiled from *The Private Equity Analyst* and the records of Asset Alternatives. I thank Steven Galante for his help.

Notes: All figures are in billions of dollars.

Other investments include funds-of-funds, secondary purchase funds, and venture leasing funds.

Exhibit 10 Private Equity Fundraising, by Investor Type, 1980–2002 (%)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Pension funds	29.8	23.1	33.3	31.4	34.1	33.0	50.1	39.0	45.9	36.4	52.5	42.2	47.8	46.8	49.1	49.7	45.4	NA	NA	48.6	40.1	41.7	45.4
Banking/insurance	13.3	15.2	14.0	12.0	13.2	10.9	10.4	15.0	9.4	12.6	9.2	5.4	16.4	15.9	17.0	17.8	19.5	NA	NA	13.5	23.3	24.5	16.1
Endowments/foundations	13.9	11.8	6.8	7.8	5.7	7.7	6.3	10.0	11.6	12.3	12.6	24.1	11.4	13.0	11.7	12.4	12.6	NA	NA	13.0	21.1	21.8	10.7
Individuals/families	15.4	23.1	20.3	20.9	14.7	13.0	11.8	12.0	8.4	6.1	11.4	12.3	10.4	7.1	10.3	8.4	7.5	NA	NA	4.9	11.8	9.4	12.0
Others	27.6	26.8	25.6	27.9	33.4	35.4	21.4	24.0	24.7	32.6	14.3	16.0	14.0	17.3	11.8	11.7	15.1	NA	NA	20.0	3.7	2.6	15.9

Source: Compiled from *The Private Equity Analyst* and the records of Venture Economics. I thank Jesse Reyes and Anthony Romanello for their help.

Notes: Prior to 1992, the tabulations include only investments in venture capital funds; thereafter, all private equity funds.

Others include corporations, foreign investors (except for 2000 and 2001), and government bodies (excluding pension funds). Commitments by funds-of-funds are not included in the tabulations.

NA = not available.