University of Rochester's Endowment Fund Review

by

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and

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I. Introduction

This report reviews the performance of the University of Rochester's Endowment Fund during the period 1970-92 and reflects on what financial-economic lessons should be learned from this experience. The University is currently searching for a new President, making this a particularly appropriate time to reconsider the basic policies that should govern the investment strategy followed by the Endowment Fund during the next several decades.

Rochester's Endowment Fund has performed poorly during the last 22 years, returning about 7% annually compared with the benchmark return[1] of 11.1%. These two decades of poor performance follow the successful tenure during 1941-71 of Mr. Hulbert W. Tripp. Under Mr. Tripp's management Rochester's Endowment Fund had grown to $580 million, making it the fourth largest private university endowment in the country. As of 1992, however, Rochester's $620 million endowment ranked twentieth among private university endowments, and its endowment assets per full-time-equivalent student ranked 63rd.[2]

Rochester's return shortfall (7% compared with 11%) over this twenty-two year period cumulates to a total loss of portfolio value of about $860 million. That is, had Rochester simply held a diversified, balanced fund of about 60% stocks and 40% bonds (a very common practice during these years among large institutional funds), Rochester's endowment today would be worth about $1.48 billion. This would place Rochester in the top ten private university endowments in total value, and in the top twenty endowments per full-time-equivalent student.

More important, this lost $860 million in fund value, if present today, would represent about

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[1] The benchmark portfolio has fixed asset-allocation weights of 60% in U.S. common stock (51% large-cap stocks and 9% small-cap stocks), 35% U.S. corporate bonds, and 5% in Treasury Bills. This portfolio is "indexed", meaning that it holds the broadly-diversified market so that the portfolio's return in each of the asset classes exactly matches that of the market-wide index.

[2] Source is 1992 NACUBO Endowment Study, prepared by Cambridge Associates, Inc., hereafter referred to as the 1992 Cambridge Study. Refer to pages 21 and 36 for rankings.

$60 to $90 million per year of additional income. The University has been under extreme budgetary pressure in the last few years, and this large foregone income quite possibly could have saved the university community from much of the recent budget cuts, program eliminations, and other austerity measures.

This financial review of Rochester's endowment performance is intended to answer three questions. First, what exactly went wrong to cause Rochester's remarkable underperformance over this twenty-two year period? Second, have the new policies instituted since the 1987 restructuring corrected these problems and reversed the Fund's underperformance? Third, are the 1988 Investment Guidelines and current policies consistent with reduced volatility of Endowment investment returns?

We conclude that Rochester broke the three cardinal rules of portfolio management by fiduciaries. In our words, these rules are to diversify completely, avoid illiquid investments, and make detailed disclosures of investments and fees. Rochester ignored all three rules before the 1987 restructuring. Although the Trustees instituted pro-diversification guidelines and mandated the use of outside money managers, our review of post-1987 investment practices indicates that Rochester still does not diversify adequately and make sufficiently detailed disclosures.

We fault the Fund's market timing strategies between 1987-92 for reducing its net returns and causing excess volatility and risk. Our view is that, unless it discontinues market timing and all other such costly "beat the market" strategies, the Fund will continue to be excessively volatile and will almost inevitably underperform the (balanced) indexed benchmark net of fees over the long term. We urge the Trustees to mandate indexing of the entire investable Fund to match the returns and risk of a pre-selected balanced benchmark portfolio.

Specifically, we recommend to the Board of Trustees that Rochester's Endowment Fund :

- adopt a specific, long-term asset allocation policy that is approved by the University President and the Board of Trustees, and index all investments to the maximum extent feasible to guarantee that future returns to the fund precisely equal the return to the selected

benchmark portfolio[3];

- discontinue paying all fees to "active" outside managers and all related transaction costs associated with their trading activity, and discontinue paying any fees for professional investment schemes or advice on "beating the market averages";
- approve only the minimal professional management fees required to completely index the Fund's investments in accordance with the approved asset allocation weights. Such fees are expected to generally be no more than one-tenth of one percent of the assets so indexed (compared with current fees of over one-half of one percent);
- revamp and enhance disclosures on endowment fund activity and performance to meet the standards generally required of publicly traded mutual funds, to provide for more complete, continual monitoring of the endowment office by interested outside parties.

The report is organized as follows. Section II discusses what is the proper objective function of a university endowment and the investment implications of this general objective. This discussion develops the rationale supporting the basic rules of portfolio management by agents, based primarily on the legal concept of fiduciary duty governing the behavior of agents who are managing the funds of principals.

Section III reviews several principles of the modern science of portfolio management and the general empirical evidence on portfolio performance to provide the relevant context against which to properly evaluate Rochester's historical performance and current investment policies. Specifically, Section III discusses the theory and application of modern asset allocation methods, and examines the

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[3] We make no specific recommendation regarding the asset-allocation weights. We do not have any objection to the post-restructuring benchmark weights of 60% stocks, 35% bonds, and 5% cash, which apparently represents the Trustees judgement of the appropriate long-term asset-allocation weights for the Fund. We would recommend that the stock portion include a significant small-cap and foreign investment and that the bonds include a significant foreign investment, in order to obtain the full benefits of global diversification. But, our central recommendation is that the Trustees, having embraced a specific policy regarding the appropriate weights, index each asset class investment so that the Fund's return exactly equals the asset-weighted average of the market-wide indexes in each asset class.

critical question of active versus passive investment management. We also present a widely used methodology for evaluating investment manager performance for "market timing" and "security selection" schemes, which are common Wall Street practices designed to attempt to beat the market averages.

Section IV turns to an in-depth examination of Rochester's performance. Here we review the historical investment practices and return performance of the Fund over the twenty-two year period. We then isolate Rochester's performance during the individual tenures of the three Investment Heads that have run the Fund's investments since Mr. Tripp retired and before the restructuring. This review shows how the failure of Rochester's Fund managers to follow the three cardinal rules directly led to the Fund's losses prior to the 1987 restructuring.

Section V is a detailed examination of the Fund's investment policies and return performance since the 1987 restructuring. This review shows that the post-restructuring investment policies and guidelines now governing management of the Fund have been inadequate to prevent excessive volatility and underperformance during the 1987-92. Section V develops the theoretical and empirical bases for our specific recommendations that the Board of Trustees ban the harmful market-timing investment schemes now being practiced, and mandate complete indexing of the Fund's investments in accordance with a policy of asset allocation across six (marketable and liquid) asset classes. Policy recommendations and conclusions are in sections VI and VII.

II. The Proper Objective Function for Endowment Investments

A. Principal-Agent Model

University endowments provide income to supplement non-endowment income such as tuition payments, research grants, and government aid. The decision by trustees to spend endowment income is equivalent to choosing to spend dollars today for educational purposes rather than investing the money, at an assumed expected return, and spending the future sum on future educational expenses. Generally, university trustees adopt policies that reflect their desire to spend current endowment income such that the Fund's real (net of inflation) value continues to increase rather than decline.

The actual return performance of the fund's investments can have a significant effect on the portfolio's value and, hence, on the contribution that the fund can make to defray current and future university expenses. Although short-term return volatility can be tolerated, consistently under-performing by even one percentage point (100 basis points, using finance jargon) will eventually decrease significantly the endowment income available for the university budget and/or decrease the real value of the endowment, sacrificing future income available for future budgets.

For example, a decrease in return of 100 basis points on a $600 million endowment will decrease the annual income available for the university budget by $6 million. Underperforming by two percentage points decreases annual income by $12 million. This $12 million shortfall, resulting from under-performance of just two percentage points, represents 25% of the University of Rochester's actual 1992 expenditures directly funded by the endowment ($48.5 million).

If the university budget is to be met in the face of significant underperformance by the endowment fund, then tuition or other income must be raised. If sufficient revenue cannot be raised, then the budget must be cut to make ends meet by reducing student aid, freezing or cutting salaries, freezing hiring or laying off employees, reducing investments in plant and equipment, and by reducing maintenance and increasing depreciation of existing plant and capital. Alternatively, the

university must turn to its alumni and other benefactors for increased gifts to allow the endowment to keep its value. Clearly, the investment performance of the endowment fund directly affects the wealth and financial soundness of the university. Further, a review of these consequences of fund underperformance, reminds us that the direct beneficiaries of the endowment fund's investment return are the university's employees, students, and alumni.

The relationship of a university's endowment to the university's employees, students, and alumni can be compared with the relationship of a private firm's employee pension fund to its employees and retirees. The principals in all pension plans are the plan beneficiaries--the employees and retirees. Their agents are the trustees of the pension plan and the investment managers, who are hired and monitored by the plan trustees. By analogy, the principals of a university endowment fund are the university's employees, students, and alumni. Their agents are the board of trustees of the university, the endowment office administrators, and the investment managers who are hired and monitored by the trustees.

The legal duties governing the conduct of pension plan trustees and their investment managers (the agents) towards the employees and retirees (the principals) is well developed. The agents owe a strict fiduciary duty to the principals, meaning that the agents must manage the pension plan investments solely in the best interests of the principals. Trustees of pension plans must scrupulously avoid conflicts of interests--situations where the best interests of the agents might conflict with the best interests of the principals. Moreover, because they are agents, trustees are legally bound to invest the plan funds so as to "maximize the net present value" of the plan, subject to the "safety first" rule of prudent risk taking.

In managing pension investments, the trustee-manager's fiduciary duty to plan beneficiaries imposes a "safety first" rule of prudent risk taking. Practically speaking, this means that pension assets should be invested largely in liquid publicly-traded securities, and that plan investments should be diversified across numerous firms, industries, asset classes, and country markets. Pension plan

trustees generally are business executives who, despite their unique skills managing their firm's investments in products and markets, generally do not possess unique advantages in financial investing.[4] Therefore, the trustees virtually always hire expert investment managers to do the actual investing, while the trustees focus on overall policy. Setting policy includes setting asset-allocation weights, negotiating fees, determining performance standards (benchmarking), monitoring manager performance, and disciplining managers. The law requires plan trustees to carefully set investment policy and to police investment managers in the sole best interests of plan beneficiaries.

Because university trustees are clearly fiduciaries regarding their oversight of endowment funds, this widely accepted principal-agent model should be the guide for determining the proper objective function of the university endowment fund and the duties of university trustees in overseeing the fund's investment policies. University trustees should obey the "safety first" rule of prudent risk taking, ensuring that the fund is at all times properly diversified across firms, industries, asset classes, and country markets and generally avoiding illiquid investments. Trustees should be expected to rely on outside investment experts to do the actual investing, but the trustees should carefully set investment policy and scrupulously police the investment managers to ensure that their activities are in the best interests of the endowment fund's beneficiaries or principals--university employees, students, and alumni.

B. Prudent Risk Taking

Endowment funds, like pension plans, can improve the long-run returns of fund investments by accepting greater financial risk. This is in the best interests of the principals because such funds can, by their nature, take a long-term investment outlook for the bulk of their investable funds. Accepting greater financial risk, if done prudently, can be very beneficial to the principals. Risk

[4] At least the law governing the duties of pension plan trustees generally would not accord business executives such financial-investment expertise based solely on their experience and success in the business world.

taking by fiduciaries is deemed "prudent" only if the agents have a reasonable (theoretical and empirical) basis to expect that returns over the long-term will provide commensurate compensation for the greater risk (or volatility).

Prudent risk taking for large funds generally means that it is acceptable for the funds to be concentrated in common stocks, so long as these investments are fully diversified and marketable. Financial theory and evidence supports the common practice of endowment funds and pension plans to have large stakes in common stocks and in longer-term bonds relative to risk-free cash. Such practice is prudent because it provides beneficiaries with the relatively greater long-term expected returns from these riskier investments. Table 1 shows how large private university endowments and large private pension plans allocate their investments. Notice the relatively high proportion (greater than 50% generally) of assets allocated to common stocks and to longer-term bonds (about 30%) relative to cash equivalents (about 5 or 10%).

University endowments, like pension plans, can also improve their returns by taking advantage of their tax-sheltered status. University endowments pay no income taxes on their returns, which provides great incentives for them to invest in securities with high before-tax returns. It makes no sense, for example, for endowments to invest in tax-free municipal bonds, because returns on tax-free bonds are bid down in equilibrium by high-tax-bracket investors. Endowments can do much better for the same risk by investing instead in taxable bonds and getting the higher return on a tax-free basis.[5]

Further, the benefits of an endowment's tax-free status are largely wasted on assets that are

[5] Indeed, some academic experts writing before the 1986 Tax Reform Act argued in favor of an all-bond strategy for tax-free funds, because bonds were generally the most tax disfavored asset in the Tax Code of the early 1980s. Refer to Chen and Reichenstein, "Taxes and Pension Plan Asset Allocation", *Journal of Portfolio Management* (Summer 1992). Since the 1986 tax reform, and before Clinton's recent reforms, stocks were the most tax disfavored assets, implying that funds should lean more towards stocks to best use the fund's tax-free status. But, Clinton's reforms return us at least partially to the pre-1986 days when bonds and high-dividend stocks are relatively tax disfavored, since capital gains rates are generally below the tax rates on income.

Table 1: Percent Allocation of Investment Across Common Stocks, Bonds, and Cash; Averages for University Endowments and Large Private Pension Plans.

	Cash Equivalents	Common Stocks	Bonds	Real Estate
1992 All Endowments[1]	6.4	53.3	31.2	9.1
1992 Private Endowments[2]	5.4	55.4	28.4	10.8
1992 Endowments Over $400 million[3]	5.2	52.5	30.7	11.6
82 Large Pension Plans; 1977-1987[4]	12.0	53.0	24.5	10.5
91 Large Pension Plans; 1977-1983[5]	12.4	57.6	21.4	8.6

Sources:

1. 1992 Endowment Study, page 172; Dollar-weighted average across 415 Endowments.
2. 1992 Endowment Study, page 172; Dollar-weighted average across 373 Private Endowments.
3. 1992 Endowment Study, page 172; Dollar-weighted average across Endowments larger than $400 million.
4. Brinson, Singer, and Beebower, "Determinants of Portfolio Performance II: An Update", *Financial Analysts Journal* (1991).
5. Brinson, Hood, and Beebower, "Determinants of Portfolio Performance", *Financial Analysts Journal* (1986).

expected to accumulate unrealized capital gains over long periods of time, such as real estate, art, metals, or coins. Venture capital investments, which are often not marketable or are traded in very thin markets, and pay little or no dividends, are also ill-suited to the tax structure of university endowments. The prospects of long-term capital gains, which presumably motivates investing in venture capital, means that in equilibrium taxable investors will be bid down the before-tax return, driving out of this market (rational) tax-free investors such as pension plans and endowments.

Non-residential real estate, too, is ill-suited to tax-free investors. The large interest and depreciation expenses that remain for real estate means that taxable investors will bid down the before-tax return, and bid up the market price of the real estate, to the point where it makes no economic sense for tax-free investors to hold. Tax-free funds that cannot realize tax benefits from these non-cash and cash expenses are expected to be bid out of this market, replaced by partnerships of taxable investors who can benefit from the tax write-offs. The empirical evidence supports these theoretical tax-based implications. Pension plans and endowments hold very little real estate, venture capital, art, metal, or precious coins compared with the proportions of assets they invest in taxable stocks and bonds.[6]

C. Full Disclosure

Further, university trustees should ensure full disclosure to the beneficiaries of the investment policies and practices of the fund. Such disclosures should include detailed disclosures on all of the fund's investments, performance measures with relevant guideposts, and all fees and related transaction costs incurred on behalf of the fund's beneficiaries. Such detailed disclosures should be a matter of long-term policy, and should not generally be altered in response to transitory fund performance, potential conflicts of interest, or other circumstances.

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[6] The median endowment in 1992 reports 0% of real estate and venture capital investments. The average endowment over $400 million in size reports an average of 3% of real estate and 3.9% of venture capital. Source is the 1992 Cambridge Study, page 172-73.

Proper disclosure policy is critical to ensuring that the trustees' oversight of the fund's investment practices and policies fully meets the strict fiduciary standards of care and prudence by keeping the beneficiaries fully informed of all relevant actions taken by the fund on their behalf. By establishing strict and detailed full-disclosure policies, trustees reduce the temptation for fund officials to reduce disclosure temporarily during bad times. A long-term policy of full disclosure makes it clear to the fund officials and trustees that all actions and policies will be fully revealed to beneficiaries, thereby establishing the proper incentives for the fiduciaries to conduct themselves in the sole best interests of the beneficiaries.

In sum, University endowments are run by agents--trustees, administrators, and their hired outside managers and advisors. The principals are the employees, students, and alumni of the university. Standard principal-agent law and practice implies that the trustees have a strong fiduciary responsibility to manage the endowment's investments solely in the best interests of the principals. Trustees of pension plans, the courts, and regulators have generally interpreted this fiduciary duty in this context to mean that trustees should follow what we refer to as the three cardinal rules of portfolio management by fiduciaries.

- Invest the overwhelming proportion of funds in marketable securities, to help satisfy the "safety first" and "prudent risk" duties.
- Diversify completely, across securities, industries, asset classes, and markets, to help satisfy the "prudent risk" duty.
- Make full disclosure on a regular basis to the principals of all material policies, actions, relationships, returns, costs, etc. regarding the agents' management of the principals' endowment fund.

III. Asset Allocation, Security Selection, and Market Timing

A. Asset Allocation Methodology

Fiduciaries responsible for managing large funds for principals, such as pension plans and endowment funds, generally focus on setting fund investment policy. This includes setting the asset allocation weights, selecting the investment managers, and monitoring managers (setting benchmark, reviewing performance, and disciplining under-performers). Asset allocation refers to the proportion of fund assets that are allocated across different kinds of securities, such as common stocks, bonds, and cash equivalents. The eight most commonly considered asset categories for large institutional funds are U.S. large-cap stocks[7], U.S. small-cap stocks, foreign stocks, U.S. bonds, foreign bonds, cash equivalents, venture capital, and real estate.[8] Setting asset allocation policy, therefore, involves determining which asset classes to invest in and how much to invest in each.

The central economic principle guiding the modern techniques for choosing asset allocations is that of the "efficient frontier" of portfolios. This concept was first introduced by Harry Markowitz, for which he won the Nobel Prize, to describe the construction of portfolios which offer an array of risk-return possibilities.[9] The efficient frontier is the boundary of portfolios offering the highest expected return for each level of risk (or variance), and the lowest risk for each level of expected return. Efficient portfolios are said to be "mean-variance" efficient. Markowitz's insight was that these efficient portfolios dominate all others, meaning that no rational investor would knowingly select a portfolio that was not on the efficient frontier.

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[7] Large-cap refers to "large capitalization" stocks, typically the S&P 500 stocks. Small-cap refers to "small capitalization" stocks, which includes the smaller stocks traded on the NYSE, American Stock Exchange and the NASDAQ system.

[8] As of 1985, the $13.7 trillion investable capital market of the world was allocated across these eight categories in the following percentages: 11.1% in large-cap domestic stocks, 7% in small-cap domestic stocks, 14.9% in foreign stocks, 20.8% in domestic bonds, 26.5% in foreign bonds, 8% in cash, .1% in venture capital, and 11.6% in real estate.

[9] Refer to H.M. Markowitz, "Portfolio Selection", *Journal of Finance* (March 1952), pg. 77-91.

Markowitz further demonstrated that efficient portfolios are always very broadly diversified, across asset classes and across securities within each asset class. Diversification dramatically reduces portfolio risk, while generally preserving expected portfolio return, because different asset classes and securities tend to have expected returns that are not perfectly correlated with other classes and securities. Indeed, Markowitz's law of diversification is so powerful that it has become finance theory's central lesson of portfolio management.

Modern investment managers and finance professionals commonly employ linear-programming algorithms to estimate asset allocations for efficient portfolios. These techniques have been taught as standard material in graduate business schools for many years, and they are universally used by practitioners to guide asset allocation decisions. These algorithms use as inputs assumptions about the expected future returns of different asset classes, the riskiness (or standard deviation of the expected returns) of each class, and the pair-wise correlations between the expected returns of all of the asset classes. These assumptions are generally based on historical data. Given these inputs, the algorithms solve for asset weights that provide the highest level of expected return given a pre-specified level of risk tolerance or, in a similar vein, they solve for the portfolio yielding the lowest level of risk given the pre-specified target expected return.

For illustration, we have applied this asset-allocation algorithm to Rochester's Fund, based on data we have available to us on expected returns, standard deviations, and correlations for the eight asset classes. The current balanced benchmark used by Rochester is comprised of 60% domestic stocks, 35% domestic bonds, and 5% cash. We further assume that the 60% in domestic stocks is comprised of 51% large-cap and 9% small-cap domestic stocks.[10] We also constrain the efficient

[10] The 60-35-5 benchmark is consistently referred to in the University Investment Reports since 1987 as the benchmark against which the Fund's performance is compared. Specifically, it is 60% of the S&P 500 stock index, 35% for the Lehman Brothers Corporate/Government Bond Index, and 5% for short-term Treasury Bills. For our performance comparisons, we adopt a similar benchmark that is more diversified. Specifically, we divide the 60% stock component into 51% for large-cap common stock and 9% for small-cap common stock.

fund to have no investments in venture capital or real estate, based on the prudent risk rule.

Based on our data, the weights for Rochester's balanced benchmark yield an expected portfolio return of 10.55% and a portfolio risk of 11.8%. Although it is well diversified across domestic asset classes, our analysis indicates that this benchmark is not strictly mean-variance efficient. The asset-allocation algorithm indicates that the efficient portfolio, given an expected return of 10.55%, would have a lower risk of 11.2%. This efficient portfolio would have 36% in domestic large-cap stocks, 7.7% in small-cap domestic stocks, 12.6% in foreign stocks, 19% in domestic bonds, 24.6% in foreign bonds, and less than 1% in cash.

Alternatively, the algorithm solves for the efficient weights that maximize expected return given that the portfolio has the risk level of 11.8%, which is set equal to the actual risk of Rochester's balanced benchmark. The efficient portfolio has a higher expected return of 10.81%, and this portfolio has 36% of large-cap domestic stock, 9.4% small-cap domestic stock, 16% foreign stock, 22.3% domestic bonds, 16% foreign bonds, and less than 1% cash. Notice that even though Rochester's balanced benchmark is well diversified, additional efficiencies in the form of higher expected return for given risk level, or lower risk for given expected return level, are available from further diversifying the fund across additional foreign asset classes.[11]

Once the asset allocation policy is determined, the fiduciary duty of fund trustees requires them to select investment managers who will do the actual investing. There are two fundamental kinds of investment managers--passive and active. Passive managers establish a portfolio that mimics

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[11] A word of caution is appropriate here. Although these asset-allocation calculations are done with mathematical precision, the exact "optimal weight" solutions are sensitive to one's specific assumptions regarding asset class expected returns, variances, and correlations. Much has been written about the best way to estimate future expected returns and risks, and it is easy to obtain differences in correlation estimates from equally authoritative sources. Nonetheless, this approach is widely used because of the important insights it provides to those setting asset allocation policy. Under wide ranging assumptions, such an approach shows that diversifying across all or most asset classes is essential to obtaining wealth-maximizing, mean-variance efficient portfolios. For example, Rochester's actual policy in the early 1980s of emphasizing venture capital and small-cap growth stocks, culminating in having over 75% of the fund in this category by 1984-85, created a very inefficient portfolio. Asset allocation analysis would have shown this inefficiency clearly before the fact, and this conclusion of ex ante inefficiency would not have been very sensitive to specific data assumptions.

the return-risk combination of a particular asset class (or asset sub-class), such as the S&P 500. Although passive managers do not trade much (hence the term passive), they do not simply "buy and hold" either. Some trading is required to continuously re-balance the portfolio in order to track the pre-selected index perfectly. The goal of passive managers is to accurately track the chosen index (or weighted average of several indexes) at minimum cost.

Modern quantitative advances allow professional managers to perfectly track any number of available stock and bond indexes at very low transaction costs. Because passive managers incur no costs for researching under-valued securities or market segments, and because they trade much less frequently than do active managers, the costs to a fund of passive management is only a fraction of the cost of active management. Recent inquiries by us of the three largest commercial passive managers (Wells Fargo, Bankers Trust, and Mellon Bank) indicate that they would index a $600 million fund for less than ten basis points annually (one-tenth of a percent).[12] This fee would be one-sixth of Rochester's current active manager fees of about 60 basis points-- an annual savings of about $3 million in fees.

B. Active Investment Managers--Stock Pickers

Active managers come in all shapes and sizes, because schemes that attempt to "beat the market averages" are limited only by the human imagination. Nonetheless, we can divide them into two basic kinds--stock pickers and market timers. Stock pickers generally select particular stocks (and/or industries) that they think are fundamentally under-valued (or, less frequently, they sell short what they think are over-valued securities), with the goal being to achieve superior returns over the near to moderate term as the market corrects the perceived mis-pricing. The term active truly applies to these managers, because they trade frequently as their perceptions of mis-pricing are subject to

[12] In fact, we understand that the business is so competitive that they would generally passively manage a fund of Rochester's size for no costs, so long as they could use the fund's assets for securities lending. Otherwise, the costs would be at most ten basis points annually.

relatively rapid change.

Domestic managers use a number of different styles, although strict categories are difficult to define with much precision. The two most common mentioned are growth and value. Growth managers concentrate on what they perceive to be high-growth companies whose stocks usually have high ratios of price to recent accounting earnings-per-share. These selection criteria generally result in heavy concentrations in higher risk, smaller companies, often in industries that are currently in favor with the investing public. Value managers try to select securities that are selling for low price-to-earnings ratios, on the theory that this is an indication that the market is not valuing these securities fully. Value managers will also use any number of other statistical methods in their attempt to select under-valued securities that they think will soon experience a price correction.

The research that goes into these selection schemes is usually very expensive, and of course the client-funds must as a group bear all of these research costs in the long-run. In fact, the bulk of this research is currently financed through so-called "soft dollar arrangements". These are legally informal, but complex, relationships among investment managers, brokerage firms, and research providers. Generally, the investment manager promises a specific brokerage firm that it will generate a certain minimum amount of commission income from trading the account of a client-fund over some future period. The brokerage firm then sets up a "soft dollar" account in the name of the investment manager, which the manager can use to "pay" for research, computers, conference travel, and any number of other legal services.

For example, the manager might order research reports from an outside research firm and the brokerage firm would be billed for the costs. The brokerage firm would then pay for the report with cash and deduct this expense from the manager's soft dollar account. To build up his soft dollar account, the manager must generate more trading volume for the brokerage firm. In this way, billions of dollars of commission income that is paid to brokerage firms by client-funds is "kicked back" to investment managers, and to the firms that provide the managers with goods and services in

return for soft dollar payments.

C. Active Investment Managers--Market Timers

Market timing is a more recent kind of active managing that has developed as an outgrowth of indexing. Market timers generally hold indexed investments, such as a stock index and a bond index. They are active managers, however, because they change the asset allocation weights away from long-term policy weights to take advantage of what they perceive to be over- or under-pricing of these market segments. A market timer, for example, might switch from holding 80% in the S&P 500 index and 20% in a bond index to holding 40% stocks and 60% bonds because they predict that stocks will under-perform bonds over the near to moderate term. After a while, they might re-allocate the portfolio to holding 90% stocks and 10% bonds to reflect their prediction that stocks will outperform bonds over the near to moderate term.

Market timers are active managers, therefore, because they incur transaction costs and non-diversification risks in the belief that they can predict broad market movements well enough to enable them to beat the market averages. If the market timer's predictions are only 50-50 accurate (or worse), then market timing must sacrifice performance over time because it results in the overall portfolio deviating from its mean-variance efficient asset weights, which are determined by the fund's basic asset allocation policy. To add value above the additional transaction costs, market timers must be able to predict to some appreciable degree the future direction of broad-based market variables, such as domestic stock prices, long-term bond yields, short-term interest rates, currency-price movements, etc. Market timing is more expensive for a client-fund than passive indexing because it usually requires significant research expenditures, incurs considerably higher trading costs, and causes the fund to deviate significantly from its policy asset weights.

D. Measuring Return Effects of Active Investment Strategies

Modern portfolio management provides a widely used framework for monitoring the

performance of funds.[13] These quantitative techniques separate precisely the effects of market timing and security selection on a fund's actual return. The data required to perform this analysis are i) the actual returns of the fund's investments for each asset class, ii) the actual weights for each asset class, iii) the policy weights for each asset class, and iv) the passive (benchmark) returns to each asset class. The following four returns are calculated for the fund over the performance period.

Actual Return = the actual asset-class weights multiplied by the actual asset-class returns, summed together, which indicates the actual return of the fund.

Passive Return = the policy asset-class weights multiplied by the passive (benchmark) returns, summed, which indicates what the fund would have earned if there had been no active security selection nor any market timing. This is the pure indexed benchmark return.

Selection Return = the policy asset-class weights multiplied by the actual asset-class returns, summed, which indicates the effect of active security selection on the fund's return.

Timing Return = the actual asset-class weights multiplied by the passive (benchmark) returns, summed, which indicates the effect of active market timing on the fund's return.

Subtracting the Passive Return from the Actual Return shows the effect on fund return performance of both security-selection and market-timing activities combined. The separate effect on fund return of just security-selection activities is the difference between the Selection Return and the Passive Return. The separate effect on fund return of just market-timing activities is the difference between the Timing Return and the Passive Return.

There is an extensive empirical literature in finance on portfolio performance concluding that market timing activities are, on average, wealth reducing. Brinson et al perform the performance tests outlined above for 91 large pension funds during 1974-83 and for 82 pension funds during

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[13] Refer to Brinson, Hood, and Beebower, "Determinants of Portfolio Performance", *Financial Analysts Journal* (July-August 1986); Brinson, Singer, and Beebower, "Determinants of Portfolio Performance II: An Update", *Financial Analysts Journal* (May-June 1991); and Brinson, Diermeier, and Schlarbaum, "A Composite Portfolio Benchmark for Pension Plans", *Financial Analysts Journal* (March-April 1986).

1977-87. He reports that market-timing investment strategies reduced gross returns by .66% annually during 1974-83 and by .26% annually during 1977-87, before deducting the additional fees that market timing costs above passive indexing. Security selection generally reduced gross returns further.

This finding is echoed by several studies of market-timing activities by professional managers and market-timing recommendations in newsletters.[14] In fact, we are aware of no authoritative empirical study claiming to support the notion that market timing strategies have added value above their costs, on average. The general finding is that market timing activities reduce portfolio value over time because managers cannot predict trends in financial markets, and re-weighting asset allocations in an attempt to exploit perceived trends involves sizable departures from what Nobel Laureate Paul Samuelson calls "across-time diversification".[15]

Security selection also receives a universal vote of "no confidence" from the vast empirical finance literature of the subject. Dozens of studies have shown that, on average, actively managed funds fail to generate returns above those available from comparable index funds, and that factoring in the additional fees attributable to active management reduces net returns below those obtainable from equal-risk indexes.[16] (Refer to the *Forbes* article "Monkey Business" attached as an Appendix to this report for a recent journalistic account supporting the same conclusion.) This research has recently been extended to evaluating the performance of U.S. based international mutual funds, with

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[14] For some of this literature, refer to Chang and Lewellen, "Market Timing and Mutual Fund Performance", *Journal of Business*, Vol. 57 (1984), pp. 57-72; Henriksson, "Market Timing and Mutual Fund Performance: An Empirical Investigation", *Journal of Business*, Vol. 57 (1884), pp. 73-96; Jagannathan and Korajczyk, "Assessing the Market Timing Performance of Managed Portfolios", *Journal of Business*, Vol. 67 (1986). pp. 217-35; Chandy and Reichenstein, *AAII Journal* (1992); Hulbert, *AAII Journal* (1992).

[15] Paul Samuelson, "Asset Allocation Could Be Dangerous to Your Health", *Journal of Portfolio Management* (Spring 1990).

[16] For examples of this literature, refer to Michael Jensen, "The Performance of Mutual Funds in the Period 1945-64", *Journal of Finance*, Vol. 23 (1968), pp.389-416: Ippolito, *Financial Analysts Journal* (1987); Ippolito, *The Quarterly Journal of Economics* (1989), Grinblatt and Titman, *Review of Financial Studies* (1989).

the same general finding that there is no evidence across funds (either individually or as a whole) that they provide investors with returns superior to those of a broad international equity index.[17]

Indeed, a recent article by Nobel Laureate William Sharpe shows that it is almost an arithmetic law that "If active and passive management styles are defined in sensible ways, it must be the case that (1) before costs, the return on the average actively managed dollar will equal the return on the average passively managed dollar and (2) after costs, the return on the average actively managed dollar will be less than the return on the average passively managed dollar."[18]

Sharpe's arithmetic propositions are confirmed by the empirical evidence cited above and by common experience. The usual practice of fund trustees is to hire several active managers, in a tacit concession that it is impossible to predict whether any particular manager will outperform the benchmark index. Sharpe's point is that, since neither trustees nor anyone else can have reliable grounds to believe they have the ability to select superior managers, then they can only rationally expect average results from any group of active managers over time. Given this, Sharpe notes, they can then only rationally expect inferior results over time, net of costs, because active management entails significantly higher costs than does passive indexing.

This common practice by fund trustees of "diversifying" across several active managers also creates, ironically, an additional source of under-diversification and financial risk. Active managers often have similar styles, and their investing practices can reflect their profession's current fads and trends, creating what is called "style over-weighting".[19] This style over-weighting can be reflected in asset weights that concentrate fund investments too heavily in certain industries or among specific

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[17] Refer to Cumbry and Glen, "Evaluating the Performance of International Mutual Funds", *Journal of Finance* (1990).

[18] W.F. Sharpe, "The Arithmetic of Active Management" *Financial Analysts Journal*, (Jan-Feb 1991).

[19] Gould and Garcia, "Some Observations on Active Manager Performance and Passive Indexing", *Financial Analysts Journal*, (July-August 1991).

market sectors, creating additional return volatility (risk) and compromising the trustees' goal of reducing risk by using several managers.

IV. Rochester's Historical Return Performance Since 1970

A. Performance Overview During 1970-1992

Rochester's Endowment Fund has performed very poorly by any reasonable standards applicable to fiduciary fund management. The annualized return to the Fund for the twenty-two year period since 1970 is 6.95%. (Refer to Table 2 at the bottom for average annualized returns for the Fund and various other indexes.) Although during most of this period the Fund was exposed to extremely high financial risks[20], the Fund actually has returned less than the annualized return to risk-free Treasury Bills over the same period, which was 7.43%. An index of large domestic stocks (virtually identical to the S&P 500) averaged 11.33%, small-cap stocks averaged 12.82%, and corporate bonds averaged 9.8% over this same period. The inescapable conclusion from Table 2 is that the Fund was under-diversified. Any portfolio reasonably well diversified over any combination of these indexed portfolios could not possibly have performed so much worse over such a long period.

Chart 1 shows the enormous power of compounding the Fund's significant under-performance over twenty-two years. Rochester's Fund was reportedly valued at $620 million as of 1992, reflecting its annualized return of 6.95% during the period. 1970-92. If the Fund had been indexed in a balanced portfolio comprised of 60% (mostly large domestic) stocks, 35% bonds, and 5% cash during this entire period, the Fund would instead be worth about $1.48 billion. Alternatively, if it had been indexed in large-cap stocks, it would be worth about $1.91 billion. Finally, if it had been indexed in small-cap (tradeable) stocks, it would be worth about $2.06 billion, which is over three

[20] The volatility measure reported at the bottom of Table 2 reveals the large year-to-year swings in return to the Fund relative to the other indexes. This is the real-world manifestation of financial risk from under-diversification. Notice that the diversified, indexed, 60-35-5 benchmark portfolio, which returned 11.17% annually, had significantly lower volatility than did Rochester's Fund.

TABLE 2 - COMPARISON OF UofR ENDOWMENT PERFORMANCE WITH BALANCED INDEX BY YEAR FROM 1970-1992

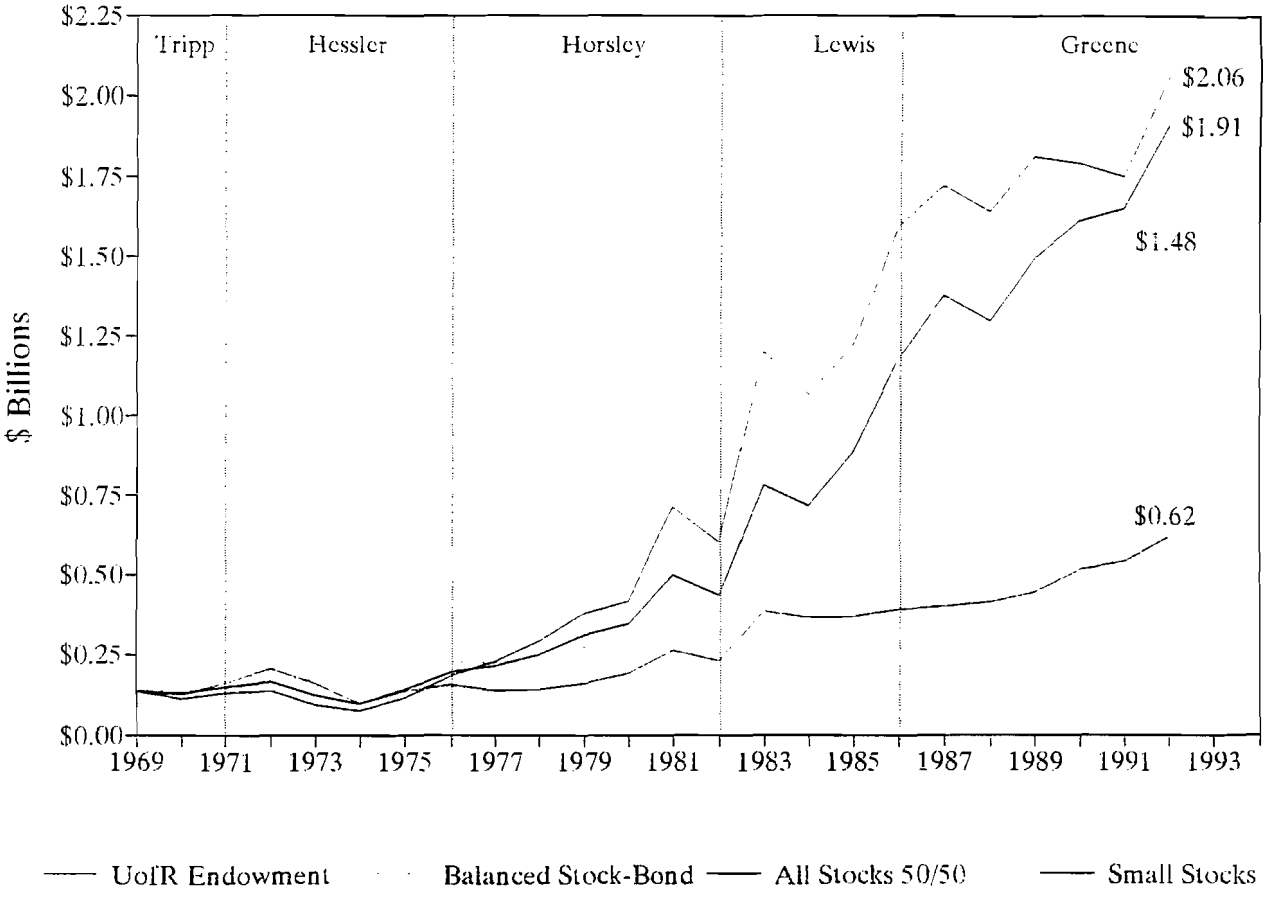
	ACTUAL U of R ENDOWMENT PERFORMANCE			PERFORMANCE FOR A HYPOTHETICAL PORTFOLIO INVESTED IN PASSIVE FUNDS GIVEN A HYPOTHETICAL ASSET ALLOCATION POLICY							
					Total Rates of Returns (2)						
Year	Actual Total Return (1)	Wealth Relative of $1 Investment at 1/1/70	Portfolio Value of 136,613,562 Investment at 1/1/70		Common Stocks	Small Company Stocks	Long-term Corp. Bonds	Treasury Bills	Total Portfolio Return	Wealth Relative of $1 Investment at 1/1/70	Portfolio Value of 136,613,562 Investment at 1/1/70
1969		1.0000	136,613,562							1.0000	136,613,562
1970	-0.0930	0.9070	123,908,500	1970	0.0401	-0.1743	0.1837	0.0653	0.0723	1.0723	146,494,001
1971	0.2900	1.1700	159,841,966	1971	0.1431	0.1650	0.1101	0.0439	0.1286	1.2102	165,327,416
1972	0.3020	1.5234	208,114,239	1972	0.1898	0.0443	0.0726	0.0384	0.1281	1.3652	186,508,338
1973	-0.2170	1.1928	162,953,449	1973	-0.1466	-0.3090	0.0114	0.0693	-0.0951	1.2354	168,767,478
1974	-0.4050	0.7097	96,957,302	1974	-0.2647	-0.1995	-0.0306	0.0800	-0.1597	1.0381	141,821,725
1975	0.4470	1.0270	140,297,216	1975	0.3720	0.5282	0.1464	0.0580	0.2914	1.3406	183,148,292
1976	0.1300	1.1605	158,535,855	1976	0.2384	0.5738	0.1865	0.0508	0.2410	1.6638	227,294,540
1977	-0.1270	1.0131	138,401,801	1977	-0.0718	0.2538	0.0171	0.0512	-0.0052	1.6551	226,105,562
1978 *	0.0294	1.0429	142,470,814	1978	0.0316	0.2825	-0.0105	0.0311	0.0395	1.7204	235,027,143
1979	0.1300	1.1784	160,992,020	1979	0.2025	0.2855	0.0722	0.0897	0.1587	1.9934	272,324,316
1980	0.2100	1.4259	194,800,344	1980	0.1064	0.1174	-0.0237	0.1130	0.0622	2.1174	289,260,216
1981	0.3600	1.9393	264,928,468	1981	0.2052	0.6968	-0.1296	0.1270	0.1284	2.3892	326,392,647
1982	-0.1110	1.7240	235,521,408	1982	-0.1142	-0.1517	0.0873	0.1352	-0.0346	2.3065	315,099,878
1983	0.6500	2.8446	388,610,323	1983	0.6101	0.9766	0.4237	0.0854	0.5516	3.5788	488,908,152
1984	-0.0640	2.6625	363,739,262	1984	-0.0460	-0.1139	-0.0624	0.0937	-0.0509	3.3967	464,037,446
1985	0.0200	2.7158	371,014,048	1985	0.3120	0.1500	0.4194	0.0902	0.3239	4.4969	614,335,142
1986	0.0530	2.8597	390,677,792	1986	0.3586	0.3045	0.2717	0.0712	0.3089	5.8861	804,123,624
1987	0.0250	2.9312	400,444,737	1987	0.2509	0.0792	0.0505	0.0553	0.1555	6.8014	929,163,446
1988	0.0320	3.0250	413,258,969	1988	-0.0690	-0.0485	0.0853	0.0550	-0.0070	6.7540	922,690,736
1989	0.0850	3.2821	448,385,981	1989	0.2052	0.1078	0.1624	0.0779	0.1751	7.9366	1,084,243,295
1990	0.1550	3.7909	517,885,808	1990	0.1640	-0.0117	0.0600	0.0813	0.1076	8.7909	1,200,960,354
1991	0.0460	3.9653	541,708,555	1991	0.0739	-0.0211	0.1060	0.0683	0.0763	9.4619	1,292,624,720
1992	0.1440	4.5363	619,714,587	1992	0.1347	0.1740	0.1675	0.0457	0.1453	10.8364	1,480,402,414
Annualized Return**	0.0695				0.1133	0.1282	0.0980	0.0743	0.1117		
Volatility Measure	0.2214				0.1919	0.3011	0.1328	0.0265	0.1529		

1. Source: U of R Endowment reports. Returns are stated on fiscal year ending on June 30 as of 1978. 6/92 Endowment market value: $619,714,587
2. Source: Ibbotson Associates
3. Allocation is based on the Endowment's current investment guidelines of 60% stocks (51% common, 9% small company), 35% bonds, and 5% cash.

* 6 months estimated return based on the change in market value from 12/31/77 to 6/30/78.

** Total annualized return for 22.5 years.

Chart 1
UofR Endowment vs. Indexed Portfolios



Source:

- UofR Endowment Returns taken from annual Investment Reports.
- Large-Cap Stocks, Small-Cap Stocks, Corporate Bonds, and Treasury Bill Returns are from Ibbotson Associates 1993 Yearbook.
- Balanced-Fund Benchmark is the weighted-average return, with 51% large-cap stocks, 9% small-cap stocks, 35% corporate bonds, and 5% Treasury bills.
- All Stocks 50/50 is comprised 50% of large-cap stocks and 50% of small-cap stocks.

times its actual 1992 value.[21]

Table 3 and Chart 2 show the Fund's actual asset allocations across four asset classes for each year during 1970-92.[22] Through most of the 1970s the Fund was concentrated in large-cap stocks. In the late 1970s the Fund, under Horsley, began shifting aggressively out of large-cap stocks and into smaller stocks and venture capital. This shift culminated in 1985, when over 80% of the Fund was concentrated in highly speculative equity investments. Since the 1987 restructuring, the Fund has adopted a more balanced asset allocation mix, although the bond proportion has grown from 14% in 1987 to 50% of the Fund in 1992.

Our detailed performance review begins with the 1970 Investment Report, which is at the end of Mr. Tripp's thirty-year tenure. First, we note that Tripp's sixteen-page Investment Report of 1970 is very complete, disclosing in detail the fund's individual holdings (market values, book values, market prices, number of units held, etc.), detailed historical charts and graphs which allow meaningful performance comparisons of the Fund with relevant benchmark over many time frames[23], and clear discussions of long-term strategies and recent actions.

It is also useful to examine the Fund's composition at the end of Tripp's tenure. In 1970 the Fund was heavily invested in the common stocks of Kodak ($ 75 million), Xerox ($78 million), and IBM ($38 million). These "Big Three" publicly-traded stocks accounted for 72% of the Fund's stock holdings, and 52% of its total holdings. Although disproportionately invested towards the Big Three, the Fund was otherwise fairly well diversified. It held twenty-four other stocks, $52 million in

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[21] Although it might be said that all-stock asset allocations are risky investments, in fact Rochester's actual investments over this 22 year period exhibited significantly greater financial risk than either the all-large-stock or all-small-stock strategies.

[22] Chart 2 and Table 3 are based on information obtained from the annual Investment Reports and reflects our best judgement given the less-than-perfect disclosures on these facts .

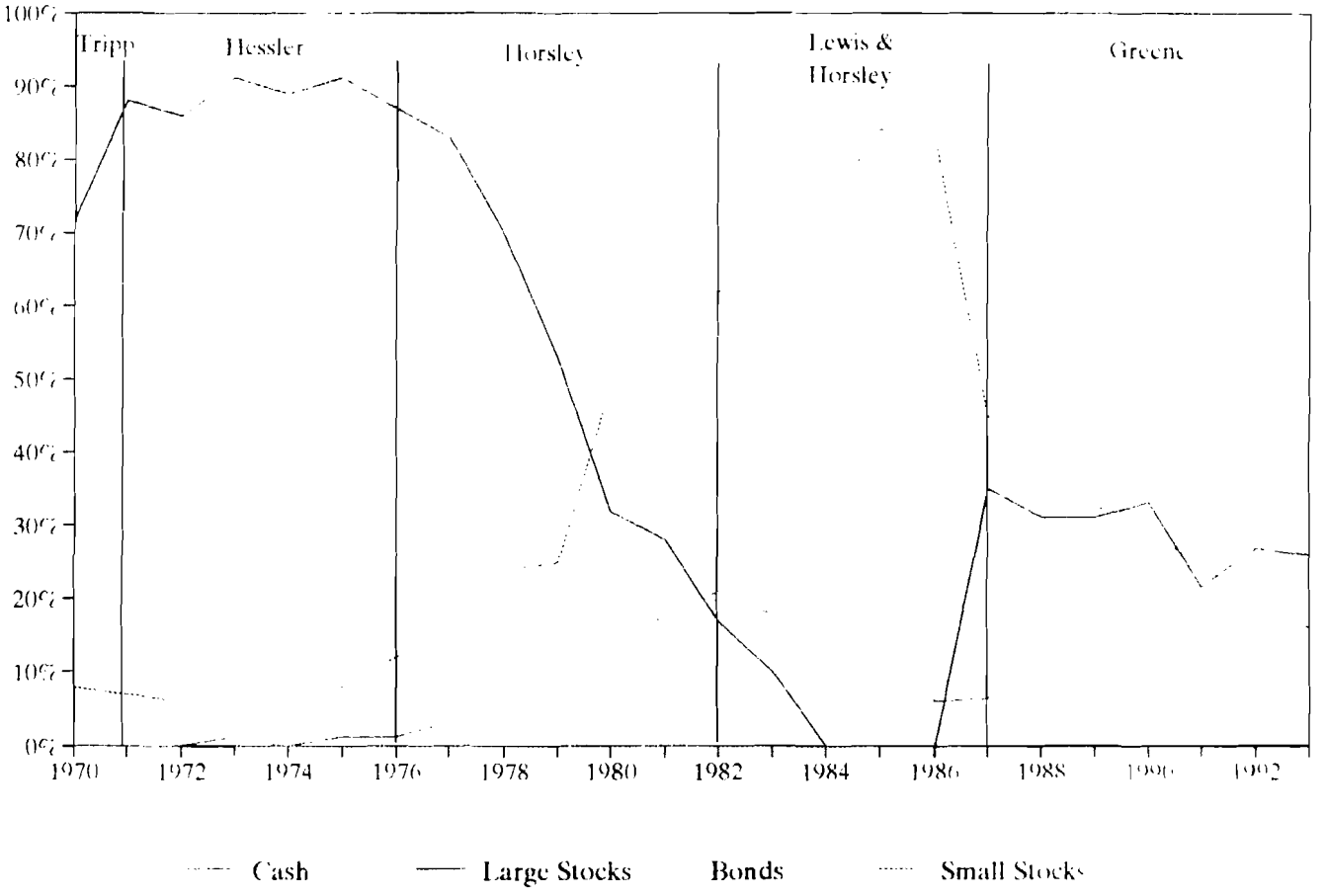
[23] Mr. Tripp wrote in his report, "The time covered in these charts is twenty years which may seem to be a rather long period but we must remember that the University is an institution in perpetuity and long-term periods have a real meaning in measuring endowment performance." Presumably, Mr. Tripp would approve of our twenty-two year review. See page 4 of Investment Report as of December 31, 1970.

Table 3
UofR Endowment Fund
Actual Asset Allocation
(Percents)

Year	Cash	Large Stocks	Bonds	Small Stocks *	
1970	0	72	20	8	Tripp
1971	0	88	5	7	
1972	0	86	8	6	
1973	1	91	0	8	
1974	0	89	0	11	Hessler
1975	1	91	0	8	
1976	1	87	0	12	
1977	3	83	0	14	
1978	6	70	0	24	
1979	22	53	0	25	
1980	19	32	0	49	Horsley
1981	17	28	0	55	
1982	21	17	0	62	
1983	18	10	0	72	
1984	26	0	0	74	Lewis &
1985	16	0	0	84	Horsley
1986	6	0	12	82	
1987	6	35	14	45	
1988	14	31	16	39	
1989	11	31	25	33	Greene
1990	5	33	33	29	
1991	14	22	40	24	
1992	3	27	50	20	
1993	6	26	52	16	

* Small stocks include investments in any assets other than cash, large stocks, or bonds, which would include non-core assets, venture capital, oil and gas royalties, special situations, as well as marketable small stocks traded on exchanges.

Chart 2
UofR Endowment Fund
Actual Asset Allocation



several different bond issues, and $30 million in convertible stocks (stock-bond hybrids).

Moreover, Tripp's Fund held very few illiquid investments (what he called "funny money"). Less than 6% of total Fund assets was invested in securities that were not publicly-traded in reasonably liquid trading markets. Nevertheless, the Fund's heavy reliance on the Big Three stocks made it volatile. The Big Three stocks lost $29 million in 1970, accounting for 61% of the total fund loss of 9.3%, during which time the general market was up about 4%.

B. The Hessler Years 1971-76

In 1971 Mr. Hessler (VP for Investments under Tripp) took over, along with two other new investment officers (Paul Lewis and Benjamin Bowker joined Phillip Horsley and Kevin Keogh). They liquidated the bond holdings and the convertible stocks and invested the proceeds in public common stocks, so that stocks now accounted for about 90% of the total Fund investments. Hessler continued to hold the huge positions in Kodak and Xerox, and he even increased somewhat the Fund's position in IBM. Hessler also continued Tripp's emphasis on holding publicly-traded, relatively liquid securities.

Volatility under Hessler remained high. The Fund returned 29% in 1971 and 30.2% in 1972, compared with 14% and 19% for common stocks generally, due to the Fund's disproportionate holdings of Kodak, Xerox, and IBM. Kodak returned 29% in 1971 and 53% in 1972, while Xerox returned 45% in 1971 and 20% in 1972. Under- diversification was not viewed as a problem, because the Big Three returns were "beating the market".

But during 1973 and 1974 the general market went down 15% and 26%. Because the Fund was disproportionately weighted towards the Big Three growth stocks, its return was whip-sawed, losing 21.7% in 1973 and 40.5% in 1974. These huge losses virtually wiped out the cumulative Fund gains of the preceding ten years!

It is also instructive to note the reduced disclosure adopted by the Hessler team during these years of negative performance. They discontinued reporting publicly the specific return performance

on individual stocks, making it difficult to monitor performance on security selection. They also began to introduce three-year and ten-year historical averages, which tended to obscure the year-to-year swings of the Fund's return relative to that of the general market.

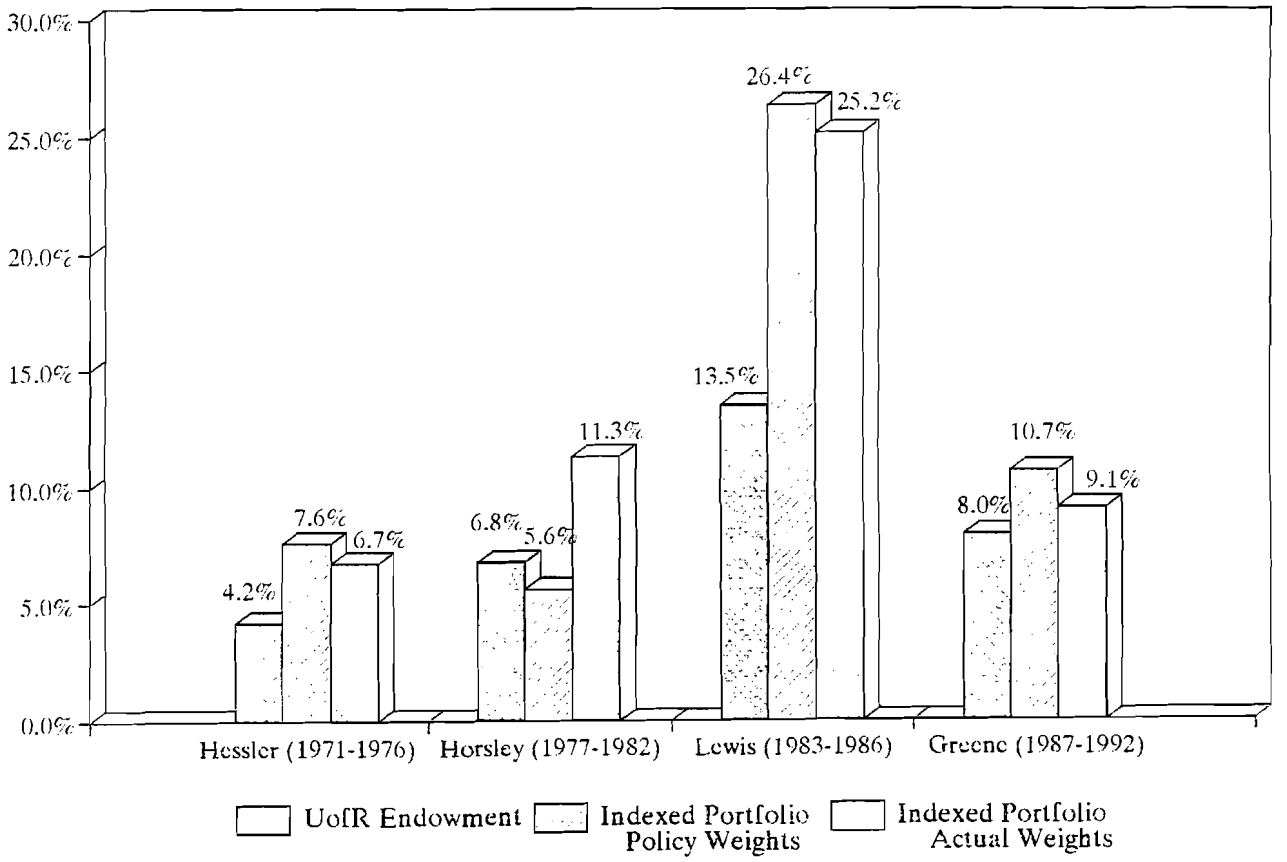
Fund performance during 1975 and 1976 was again more volatile than the market due to the Fund's concentrated holdings in the Big Three stocks. In 1975, the Fund outperformed the market (44.7% versus 37.2%), but in 1976 the Fund under-performed (13% versus 24%). Stock holdings continued to account for about 90% of total Fund assets, with the Big Three stocks comprising about 50% of all stock holdings and 44% of total Fund assets. The other 10-12% of the Fund not invested in liquid common stocks, however, was by 1976 almost all invested in illiquid "special situations" and "funny money" accounts.

Overall, the Fund performed poorly during the Hessler years. The annualized return was 4.2% during 1971-76. Applying the performance methodology described earlier, the passive return is 7.6%. (Refer to Chart 3.) That is, the balanced index comprised of 60% stocks, 35% bonds, and 5% cash had an annualized return of 7.6% during 1971-76, which is 3.4% superior to that of the Fund. The Timing Return is 6.7%, which is calculated using the actual asset weights from Table 3 and the index returns from Table 2. This means that the Fund lost about .9% annually from having asset weights different from those of the balanced portfolio. In addition, the Fund lost about 2.5% annually due to security selection (or under-diversification across stocks).

C. The Horsley Years 1977-82

In 1977 Mr. Phillip Horsley began his six-year stint as head of the Fund's investment policy by reporting a loss for the Fund of 12.7% compared with the general market return of -7%. Although 83% of the Fund was invested in common stocks, Horsley soon began a program to systematically liquidate the Big Three holdings. When Horsley took over, the Fund still held about 735,000 shares of Kodak, 710,000 shares of Xerox, and 120,000 shares of IBM. By 1979, the Fund's Big Three shareholdings were about half of these 1976 levels. By 1982, virtually all of the

Chart 3
Annual Compound Return for the
Endowment vs. the Indexed Portfolios by
Tenure of Investment Manager.



Big Three stock was gone from the Fund. Horsley's sales of the Big Three brought cash proceeds into the Fund of about $150 million over this period.

This $150 million in proceeds from liquidating the Big Three stockholdings was almost entirely invested in very illiquid and highly speculative equity and venture capital investments. These equity investments included smaller stocks traded over-the-counter (or not at all), non-public and non-traded venture capital positions, illiquid oil and gas limited partnerships, and other illiquid special situations. Indeed, much of this money eventually came to be managed under a fee-based arrangement with Rochester by Mr. Horsley's money management firm, Horsley Keogh & Associates, which was formed around 1983.

Beginning with 1978, the Fund's Investment Reports cover fiscal years ending June 30. The Fund's six-month estimated return for 1978 is a meager 3% (annualized). The Investment Report that year under Horsley was two pages long, down from 16 pages in 1976 under Hessler. There is no detailed information provided beyond disclosing that $13 million is invested in "Special Situations".

The two page report of 1979 only reveals that now $18 million has been invested in "Special Situations". The cash position of 22% is ballooned by the sales of the Big Three stocks.[24] By 1980 Special Situations accounted for $26.7 million and oil royalties $37.2 million. The 1981 report discontinues the disclosure of information on asset allocation. The text notes that over $60 million is invested in venture capital and related investments, and that these Special Situations have "become an increasingly important element in the University's investment strategy."[25] Despite this importance, no information is provided about these investments much beyond the generic reference of "special situations", and no performance measures are disclosed for this class of investments for any specific

[24] Horsley wrote that, "Most of the balance will be used for common stock purchases although oil royalties and special situations are also on the shopping list." The public data indicate that very little if any of this cash was invested in marketable common stocks. It all went into illiquid venture equity.

[25] Refer to Investment Report for the fiscal year ending June 30, 1981, page 2.

special-situation investment.

By 1982, the Investment Office had formed a new in-house investment management group called University Ventures, with Horsley holding both titles of VP for Investments and Chairman of University Ventures. Kevin Keogh became the President of University Ventures. The report discloses that this formation of University Ventures was "thought to be the first of its kind established by a major university, reports to its own Board of Directors, and had $87 million under management on June 30. 1982."[26] Despite the unprecedented nature of this new relationship, and the attendant risks of conflicts of interest, this sentence is the full extent of public disclosure regarding this venture.[27]

Table 3 reveals the significant asset-allocation changes under Horsley. The proportion in large-cap, liquid stocks declined from nearly 90% to about 17%, while the fraction in small stocks rose from 12% to 62%. This small-stock category contains Horsley's concentrated investments in venture capital and is mostly illiquid. The cash proportion rose from 3% to 21%, reflecting the proceeds from selling the Big Three stocks. Table 3 shows that by 1986 Horsley's successor had invested nearly all of this cash in special situation equity.

Chart 3 reports that the Fund's return performance under Horsley was poor, mainly due to security selection. The Fund's annualized return was 6.8% during 1977-82, which was superior to the passive return of 5.6%. The Fund return, however, was significantly below the 11.3% market-timing return, computed using the Fund's actual weights and indexed asset-class returns. This means that Horsley's (market-timing) strategy of concentrating in small-cap stocks during 1977-82 would have earned the Fund 11.3% annually if the Fund had invested in liquid, tradeable small-cap stocks instead of the actual illiquid special-situation equities. Horsley's security-selection losses reduced the

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[26] Refer to Investment Report for the fiscal year ending June 30, 1982, page 3.

[27] The total number of employees staffing the Investment Office is up to eleven by 1982.

annualized Fund return by about 5.7%, which swamped the market timing gain of 1.2%.

D. The Lewis Years 1983-86

The 1983 Fund Investment Report declares that University Venture's investments have been a success, citing that venture investments returned 108% during the last year. It is not clearly explained how these rates of return are computed. This is a relevant issue because the Fund's venture-equity investments are not traded and have no obvious indicator of market value.

The overall Fund return reported for 1982-83 is 65%. Although the Fund does not compare its return to any benchmark, Table 2 shows that the index of large-cap stocks returned 61% and the publicly-traded small stock index returned 98%. In view of the additional risk of the Fund's illiquid venture investments, the 108% reported by University Ventures does not compare favorably with 98% for a diversified portfolio of marketable small-cap stocks.

Nevertheless, the Fund's 65% gain apparently persuaded the Fund and its Trustees to continue to concentrate Fund assets in venture equity. In 1983 the University Ventures team of Horsley and Keogh was split off from the Endowment Office and renamed Horsley Keogh & Associates (HKA), with Horsley's old assistant Paul Lewis becoming the Fund's new Investment head. Even though much more of the Fund's money was put under HKA management, the Fund still made no public disclosures of the fee arrangements or of any details of the specific investments made by HKA.

Rochester's Fund became extremely concentrated in illiquid venture investments and high-tech small companies under Lewis, when the bulk of the Fund was managed by HKA. According to the 1983-84 Investment Report the Fund had $157 million in riskless cash-type instruments. The other $442 million of Fund assets was very under-diversified and illiquid. These investments included $51 million of HKA-managed venture capital in small unlisted private companies. Another $97 million was invested in non-traded venture capital limited partnerships ($76 million of this was managed by HKA). $18 million was in special situations in public companies that were termed "highly speculative" (probably over-the-counter stocks). $215 million was invested in publicly-traded

common stocks, heavily weighted towards small growth companies in high-tech businesses.

Table 3 classifies all of these risky equity investments together under "small stocks". This category accounts for over 80% of total Fund assets in 1984-85. We estimate that over half of the $600 million in total Fund assets was invested in non-traded equity ventures as of 1985. Over $500 million in assets were invested in a single market segment, that of small, high-tech growth companies. The Fund had virtually no significant investments of the normal kind in large-cap common stocks, marketable small-cap stocks, or corporate bonds.

This risky strategy failed. During 1985, 1986, and 1987 the Rochester Fund returned 2%, 5.3%, and 2.5%. During these same three fiscal years the general stock market returned 31%, 36%, and 25%. The market for high-grade bonds returned 42%, 27%, and 5%. The balanced benchmark index returned about 100% cumulatively over these same three fiscal years. Rochester's Fund was outperformed even by risk-free Treasury bills.

As performance worsened, so did the quality of the Fund's public disclosures. The Fund's 1985 Investment Report had this to say about why the Fund earned 2% when the market gained 31%. "Our specialized portfolio composition is very different from the market averages and cannot be expected to move with them over short time periods, although the longer-term performance has been very satisfactory."[28] By 1985 the Fund in its public reporting lumps limited partnership investments together with common stocks, making it harder for outsiders to understand the Fund's asset allocation and the extent to which HKA was controlling Fund investments.[29]

Chart 3 summarizes the Fund's performance during the Lewis years. The Fund's absolute return is 13.5% annualized, mostly due to the 65% return in 1983. During the same four-year period the annualized passive return is 26.4%. The timing return is about the 25.2% annualized. This

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[28] Refer to Investment Report for the fiscal year ending June 30, 1985, page 3.

[29] Venture Investments account for $147 million in 1985, which is all managed by HKA. Plus, HKA reportedly managed significant other assets for the Fund.

means that the Fund's relatively poor performance is attributable almost entirely to security selection, rather than market timing (or asset allocation). The poor performance was not caused by concentrating in small-cap stocks. Rather the poor performance can be traced to mistakes in selecting the particular small-cap equities that the Fund held.

Apparently in reaction to this dismal performance, Rochester's Board of Trustees during 1986 initiated a full review of the Fund's investment policy by an outside expert. The Fund reported another disappointing return of 5.3%, including a loss of 4.1% on HKA's venture investments. By comparison, marketable small-cap stocks gained 30%, and the balanced benchmark index gained 31%.

The Trustees accepted the outside expert's advice "to return to a more diversified asset mix".[30] They immediately restructured the Endowment Office. By 1987 Lewis and his team had left the University, and Richard Greene had taken charge of managing the Fund's new policy of diversification.

[30] Refer to Investment Report for the fiscal year ending June 30, 1986, page 2. We have not seen a copy of the consultant's report, and it is our understanding that this document is non-public information.

V. The Post-Restructuring Performance and Policies of the Fund

Richard Greene's restructuring included liquidating the illiquid portion of the portfolio that he inherited from Lewis and turning the money over to outside professional investment managers. The outside managers were hired to "provide management services of a balanced fund nature; they will invest in both stocks and bonds and are expected to vary the mix between the two from time to time, based upon their perceptions of the relative attractiveness of these two major asset groups."[31]

In other words, the managers would be active and would engage in formal market-timing strategies for a fee in an attempt to outperform the indexed balanced benchmark over a reasonable period.[32] By 1988 about 60% of the Fund's assets were managed by three outside "core managers". Greene also reported in 1988 the termination of the relationship between the University and HKA, writing that "...we part on very good terms and with thanks to HKA for the extraordinary services rendered through the life of the agreement."

As part of its review and restructuring, the Board of Trustees released a written Statement on Investment Guidelines ("Guidelines") as an Appendix to the 1988 Investment Report. We summarize the relevant statements below.

- Stocks will comprise between 40% and 80% of market value of the Fund, bonds between 10% and 50%, cash between 0% and 20%, and other investments (principally oil royalties and real estate) between 0% and 20%.
- The stock portfolio will be highly diversified, with no single issue accounting for more than 5% of the total managed by that manager unless approved by the Board.
- Annual turnover of the common stock portfolio will generally not exceed 50% for U.S stocks and 100% for foreign stocks.

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[31] Refer to Investment Report for the fiscal year ending June 30, 1987, page 1.

[32] MAS received $125 million in 1986. MIM received $95 million. In 1988 PIM was hired to manage a $50 million bond portfolio. MAS, MIM, and PIM are all outside professional money management firms.

- Bonds will be diversified and be of investment grade or better. No more than 15% can be held in a single industry and no issuer can account for more than 5% of the bond portfolio.
- Bonds must be less than 10 years in duration. There are no turnover limitations to the bond portfolio, "thereby permitting the investment manager to add value through arbitrage transactions".
- Venture capital investments at cost will not exceed 10% of the Fund. All such investments must receive prior approval by the Board.
- Foreign investments will not exceed 25% of total Fund assets, and real estate investments at cost will not exceed 15% of the Fund. Moreover, the Fund cannot hold securities of any firms doing business in South Africa.

Table 3 reveals that the Fund reduced the concentration in small stocks immediately in 1987 from 82% to 45%. This weight has gradually been reduced during 1987-93 to about 16%. The proceeds have been largely turned over to reputable outside managers, who have invested in large public stocks and high-grade bonds. As recently reported, five outside core managers now accounted for about 80% of Fund assets.

The proportion of the Fund invested in large-cap stocks jumped upon Greene's arrival from zero to 35%, but has since declined to 26%. The proportion in bonds, on the other hand, has risen significantly under Greene, from 14% in 1987 to 52% recently.

Chart 3 analyzes the Fund's performance under Greene through 1992. The actual annualized return is 8%, which is 2.7% worse than the annualized passive return of 10.7%. The timing return is 9.1%, computed using the actual asset-allocation weights and the passive (indexed) returns. This means that about half of the Fund's total annualized return shortfall of 2.7% against the passive (balanced fund) benchmark is attributable to harmful market timing strategies, and the rest is attributable to poor security selection.

But, this look at post-restructuring performance is possibly skewed by the mixing together of the core assets managed by the new outside managers with the illiquid venture investments held over from the Lewis-Horsley portfolios. Since 1987 the Fund's Investment Reports have broken out the returns of the core assets from the returns of the non-core assets. It is appropriate, therefore, to take a closer look at the performance of the core assets.

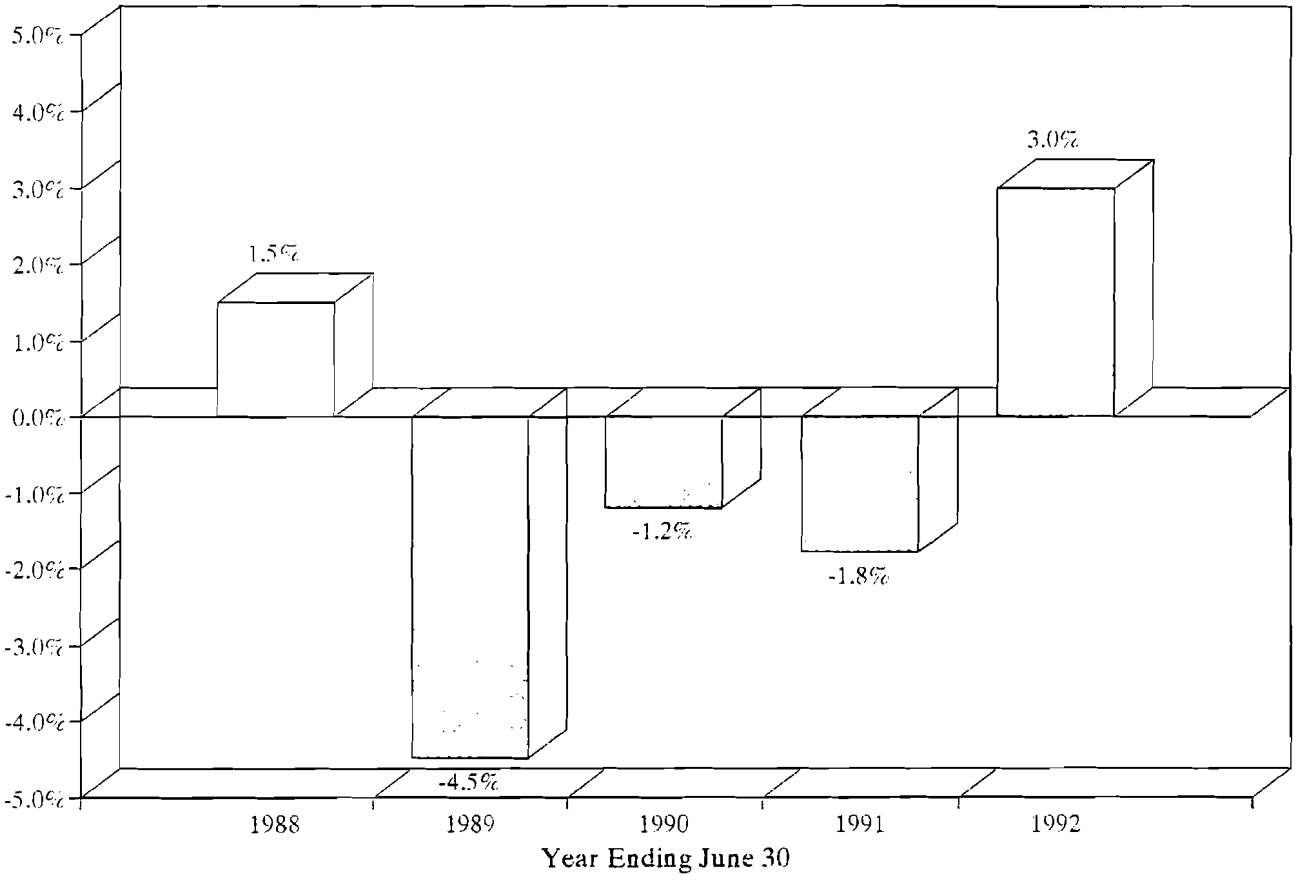
Chart 4 compares the returns on the Fund's core investments to the benchmark returns annually during 1988-92. The annualized core return over these four years is 9.6% compared with 10.2% to the benchmark . More important than this average return shortfall of about .6% is the year-to-year variation between the Fund's core return and the benchmark return. The average absolute yearly deviation is about 2.4%. While this annual return deviation is much reduced from the pre-restructuring years, a level of 2.4% indicates that the Fund's core returns have been significantly more volatile than those of the indexed benchmark against which the core performance is measured.

The source of this volatility is almost certainly the market timing strategies of the Fund and its outside managers. This is indicated by the wide swings in asset allocation weights of the Fund compared with the constant weights (65% stocks, 35% bonds, and 5% cash) of the passive balanced-fund benchmark. The core assets were weighted two-to-one in favor of stocks over bonds in 1987 and 1988, but the core has shifted to being weighted nearly two-to-one in favor of bonds by 1992. The Fund discloses that this shift to concentrate in bonds... "continued to reflect the Investment Committees's belief that, with inflation under control, with real (inflation-adjusted) long-term interests rates at historically high levels and common stock yields at very low levels, bonds offered total return possibilities equivalent to large cap stocks."[33]

Of course, the 1988 Guidelines sanction wide swings in Fund asset allocations, allowing for

[33] The Investment Committee's predictions for the future were not confined to the domestic marketplace. They also rationalize the Fund's "very significant allocation" to foreign bonds with their prediction "that interest rates in Europe will continue to trend downward". See the Investment Report for 1992-93.

Chart 4
UofR Core Group vs. Benchmark
Annual Difference in Returns
1988 - 1992



	Core Group Return	Benchmark Return	Core Minus Benckmark	Absolute Difference
1988	1.2%	-0.3%	1.5%	1.5%
1989	12.4%	16.9%	-4.5%	4.5%
1990	11.6%	12.8%	-1.2%	1.2%
1991	6.9%	8.7%	-1.8%	1.8%
1992	16.4%	13.4%	3.0%	3.0%
Average Annual	9.6%	10.2%	--	2.4%
Total	--	--	-3.0%	12.0%

Source: 1991-1992 Investment Report.

stocks to swing between 40% and 80% and bonds between 10% and 50%. Moreover, the 1988 report by Greene explicitly stated that the outside managers were hired to change these stock and bond weights regularly to take advantage of what they perceived to be market opportunities.[34] This strategy reflects the Fund's current practice of making significant market-timing bets which are inconsistent with the efficient-market theory of asset pricing and the vast empirical literature supporting it.

Since the 1987 restructuring, the Fund has consistently disclosed its performance relative to a "balanced fund" index . This index (or benchmark) is the return to a portfolio invested 60% in the S&P 500 index of large-cap stocks, 35% in the Shearson Lehman Government/Corporate Bond Index, and 5% in Treasury Bills. The Guideline weights discussed above are consistent with this 60-35-5 indexed benchmark. That is, both the 1988 Guidelines for asset weights and the 60-35-5 benchmark reveal the Trustees' 1987 judgement that, over the long-term, the Fund should allocate its investable dollars about two-to-one in favor of stocks over bonds.

The current bond-heavy portfolio, therefore, reflects classic market-timing strategy of altering the Fund's asset weights in the short-term significantly away from long-term policy weights to take advantage of the perceived mis-pricing of broad asset classes. Here, the specific gamble of the Fund is that over the next few years the market will correct its currently over-valued stock market and its currently under-valued bond market. If the Investment Committee's financial predictions do not come true, then Rochester's Fund must perform significantly worse than the passive 60-35-5 benchmark. Alternatively, if the Committee is right, then the Fund will outperform the index.

If the Investment Committee and its advisors cannot consistently score better than 50-50

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[34] Despite the wide asset-allocation latitude provided by the 1988 Guidelines, the Fund's current concentration in bonds of 52% exceeds the 50% Guideline limits, and its low concentration in stocks admittedly were below the 40% specified by the Guidelines. Greene writes in the 1992-93 Investment Report, with regard to the equity asset allocation, that it is "at the very bottom of their guideline range of 40% to 80%. Indeed...they were slightly below it."

making these kinds of bets against the markets, then inevitably over the long-term Rochester's Fund will perform with excessive volatility and the Fund's net-of-fees performance will be significantly below that of the indexed benchmark. Fund performance since 1987 supports the efficient market's view that these market-timing gambles create excessive volatility and underperformance. And indeed, we cannot reasonably expect the Fund's advisors to "time" correctly more than one-half of their investments in the environment of efficient capital markets.

VI. Specific Recommendations for Further Reforming Policy

The systematic empirical evidence strongly implies that market timing strategies are more likely to be harmful than helpful to the Fund over time. In our view, market timing strategies are philosophical products of the same "beat the market" mentality that has so harmed the fund in the past. It is likely that the diversification guidelines, instituted since the restructuring, limit the potential financial harm from such schemes by limiting the scope of "beat the market" schemes consistent with the guidelines. Indeed, the post-1987 returns and volatilities, while apparently reduced by the Fund's market timing strategies, still reflect vast improvement over the pre-1987 performance.

But market timing is a risk-increasing strategy and it can backfire badly. For example, Table 2 shows that over long periods stocks provide significantly higher returns than bonds. This is why fiduciaries managing funds with long-term objectives consistently adopt asset-allocation weights that are heavier for stocks than bonds. During the twenty-year period 1973-92 the cumulative return for the S&P 500 was 751%. If a hypothetical market-timer was out of this market for the single best month over this twenty years, that investor's cumulative return would have been 630%, a reduction of 120 percentage points. If the market timer missed the best two months, his return drops to 471%. Missing the best five months cuts the total return in half to 353%, and missing the best ten months reduces it to 170%.

While underperformance similar to that experienced by the Fund over the 1971-87 period is unlikely to recur, the Guidelines still provide ample room for market timing strategies to create excessive volatility and intolerable underperformance. This is because the Guidelines allow for large swings in asset-allocation weights, and because the Investment Guidelines expressly sanction market timing strategies that operate by changing these weights. To see the potential effects on volatility and returns from the asset allocation discretion allowed by the Guidelines, we performed statistical simulations using actual asset-class returns during the 1986-92 period.

Table 4 reports the yearly returns to a hypothetical Fund that chooses new asset weights at the beginning of each month during 1986-92. These weights are constrained, however, to always be within the Guideline limits, meaning that stocks can vary between 40% to 80%, bonds between 10% and 50%, cash between 0% and 20%, and the weights must sum to one always. "Correct" market timing means that the Fund's weights are most advantageous given perfect foresight of next month's actual returns to stocks and bonds. "Incorrect" market timing means the opposite--the weights are most disadvantageous given perfect foresight.

Correct market timing by this test would have yielded an annualized return of 24% over 1986-92. Incorrect market timing would have yielded an annualized return of only 3.4%. This range of 3.4% to 24% shows the enormous potential for return volatility from market-timing strategies. This volatility is present despite the fact that the market timer is i) perfectly diversified within each asset class (there are no security selection losses), ii) perfectly within the 1988 Investment Guideline asset weights, and iii) pays no transaction costs of any kind.

The three-month strategy reported in Table 4 simulates a market timer who holds a passively indexed portfolio with fixed 60-35-5 weights for 9 months out of the year, and who actively market times for 3 months a year. Even this limited market-timing yields a range of annualized returns of 8.4% (for incorrect judgement) to 18.8% (for correct judgement). These wide ranges indicate that market timing strategies, which fully conform with the 1988 Guidelines and are based on actual returns, have the potential to cause Fund underperformance and return volatility equal to the levels actually experienced by the Fund during the pre-restructuring years.

Our recommendation to the Trustees is that they add a prohibition of market timing strategies to the Guidelines. The current Guidelines have benefitted the Fund to the extent that the they have enhanced diversification and avoided illiquid investments. The Fund would further benefit from the formal banning of market timing schemes, for the same financial-economic reasons that the Trustees banned security-selection schemes. Market timing, like the practices that the 1988 Guidelines

Table 4
Returns to Hypothetical Market-Timing Strategies, within the
1988 Guidelines, Compared with Actual Returns to Stocks, Bonds, and Cash.
1986-1992

	12-Month Market Timing (1)		3-Month Market Timing (2)		Actual Returns			
Year	Correct	Incorrect	Correct	Incorrect	Large Stocks	Small Stocks	Bonds	Cash
1986	39.0%	21.1%	34.9%	26.6%	35.6%	30.5%	27.2%	7.1%
1987	29.2%	3.3%	21.5%	9.9%	25.1%	7.9%	5.1%	5.5%
1988	16.1%	-13.8%	9.8%	-9.0%	-6.9%	4.9%	8.5%	5.5%
1989	24.3%	10.4%	20.6%	14.2%	20.5%	10.8%	16.2%	7.8%
1990	20.4%	2.2%	15.2%	6.5%	16.4%	1.2%	6.0%	8.1%
1991	18.5%	-2.2%	12.9%	3.3%	7.4%	-2.1%	10.6%	6.8%
1992	22.4%	6.4%	18.3%	10.6%	13.5%	17.4%	16.8%	4.6%
Annualized 1986-92	24.1%	3.4%	18.8%	8.4%	15.2%	9.6%	12.7%	6.5%

1. 12-month market timing strategy is Correct (perfectly right) when at the beginning of each month the Fund is perfectly allocated within the investment guidelines limits given perfect knowledge of coming month's returns to the four asset classes. 12-month market timing strategy is Incorrect (perfectly wrong) when at the beginning of each month the Fund is perversely allocated within Guideline limits given perfect foresight of the next month's returns to the four asset classes.

2. 3-month market timing strategies are the same as the 12-month except the strategies (Correct or Incorrect) are in place for only 3 months out of 12, with the Fund being passively indexed using the 60-35-5 benchmark for the other 9 months out of the year.

prohibit, result in under-diversification and excess volatility and, under the generally accepted theory of efficient markets, will result in significant underperformance over the long term.

Instead of the current market-timing practice of shifting asset-allocation weights from period to period based on the Investment Committee's predictions of future inflation, short-term interest rates, long-term bond rates, corporate profits, foreign bond rates, foreign corporate profits and so on, we strongly recommend that the Trustees mandate a narrow permissible range of asset weights for well-defined asset classes. The 1988 Guideline weights of 60% stocks, 35% bonds, and 5% cash are perfectly sensible given our knowledge of historical risk-return relations among the broad asset classes. The Trustees should set specific long-term weights, such as these, and specific fractions of foreign investments for each class, and instruct managers to implement these weights precisely. There should be no scope for short-term deviations based on predictions of the relative performances over the future among asset classes, because the Trustees have no reliable basis for accepting such judgements.

This recommended policy of setting asset allocations and indexing the assets to implement this policy has several advantages to fiduciaries such as the University's Trustees:

- It avoids the under-diversification, excessive volatility, and underperformance of active management, both security selection and market timing. If this policy had been implemented in 1970 and adhered to through 1992, the Rochester Fund would be currently valued at over $1.5 billion.
- Indexing is much more economical than active management. Our preliminary research indicates that fees for indexing are at most 10 basis points, compared with the current Fund fees of about 60 basis points. This difference translates into about $3 million annually on a $600 million portfolio. This gain is immediately available and risk free, unlike the speculative benefits promised by active managers.
- This policy virtually eliminates monitoring expenses and other internal administrative

costs. CALpers, the nation's largest institutional investor, indexes most of their equity investments. Their total in-house staff overseeing this huge portfolio is two people.

- This policy avoids outside second-guessing of the fiduciaries. The asset allocations are fixed and set in accordance with a supportable long-term policy. Because of indexing, the absolute performance of the fund perfectly equals the benchmark. By definition, there are no deviations to require explanation. This is important especially to fiduciaries, who have to meet such rigorous standards of prudence and care.

These advantages explain why there has been a pronounced trend to indexing among fiduciary-managed pension funds over the last 20 years. Although in the past there has been significantly less indexing among university endowments, our research indicates that the principle reason is the investment restrictions that constrain universities, mainly the prohibition of investing in companies that do business in South Africa. Such restrictions severely interfere with the computerized programs that provide indexing services for economical fees. This restriction has been recently lifted for the University, paving the way for wholesale indexing of the Fund.

VII. Conclusion

This financial review of Rochester's endowment performance is intended to answer three questions. First, what exactly went wrong to cause Rochester's remarkable underperformance over this twenty-two year period? Second, have the new policies instituted since the 1987 restructuring corrected these problems and reversed the Fund's underperformance? Third, are the 1988 Investment Guidelines and current policies consistent with reduced volatility of Endowment investment returns?

We conclude that Rochester broke the three cardinal rules of portfolio management by fiduciaries. In our words, these rules are to diversify completely, avoid illiquid investments, and make detailed disclosures of investments and fees. Rochester ignored all three rules before the 1987 restructuring. Although the Trustees instituted pro-diversification guidelines and mandated the use of outside money managers, our review of post-1987 investment practices indicates that Rochester still does not diversify adequately and make sufficiently detailed disclosures.

We fault the Fund's market timing strategies between 1987-92 for reducing its net returns and causing excess volatility and risk. Our view is that, unless it discontinues market timing and all other such costly "beat the market" strategies, the Fund will continue to be excessively volatile and will almost inevitably underperform the (balanced) indexed benchmark net of fees over the long term. We urge the Trustees to mandate indexing of the entire investable Fund to match the returns and risk of a pre-selected balanced benchmark portfolio.

Specifically, we recommend to the Board of Trustees that Rochester's Endowment Fund :

- adopt a specific, long-term asset allocation policy that is approved by the University President and the Board of Trustees, and index all investments to the maximum extent feasible to guarantee that future returns to the fund precisely equal the return to the selected benchmark portfolio;
- discontinue paying all fees to "active" outside managers and all related transaction costs associated with their trading activity, and discontinue paying any fees for professional

investment schemes or advice on "beating the market averages";

- approve only the minimal professional management fees required to completely index the Fund's investments in accordance with the approved asset allocation weights. Such fees are expected to generally be no more than one-tenth of one percent of the assets so indexed (compared with current fees of over one-half of one percent);
- revamp and enhance disclosures on endowment fund activity and performance to meet the standards generally required of publicly traded mutual funds, to provide for more complete, continual monitoring of the endowment office by interested outside parties.

This recommended policy of setting asset allocations and indexing the assets to implement this policy has several advantages to the University's Trustees.

- It avoids the under-diversification, excessive volatility, and underperformance of active management for both security selection and market timing.
- Indexing is much more economical than active management.
- This policy virtually eliminates monitoring expenses and many other internal administrative costs.
- This policy avoids outside second-guessing of the fiduciaries and more completely fulfills the Trustees duties for care and prudence as fiduciaries.

Business spends $9 billion a year on money managers for its pension funds. Most of the spending is futile.

Monkey business

By Dyan Machan



Illustrations by Gary Hallgren

WILLIAM FOUSE, chairman of Mellon Capital Management, speaks irreverently about pension fund management. "It's like monkeys trading bananas in trees," he says. "The money managers end up with a lot of the bananas."

About $9 billion worth of bananas. That's the amount U.S. business spends every year on money managers who manage the money put away for the employees' pensions. Since the money managers do not themselves produce bananas, there is that much less for the pensioners.

That's not the way the people at pension funds see things. They believe that by hiring the right money managers they can beat the market and thereby get a better deal for their company and for its employees. Occasionally they do. For the past five years the actively managed equity portions of the Ford Motor and AT&T pension funds have outperformed the S&P 500 index by modest margins. But, overall, active money management is a losing game. On an average day about half of the trading on the New York Stock Exchange is done by pension fund managers. Thus, increasingly, pension funds and other institutional investors *are* the market. By definition, the market cannot beat the market.

So why bother trying? "I've asked myself that question a hundred times," says Robert Kirby, the unusually candid director of Capital Guardian Trust, which handles $32 billion in mainly pension fund investments and has beaten the average over the last ten years. Kirby says he hasn't yet come up with a good answer to the question.

One 1992 study by the Brookings Institution shows that the average professional investment manager lagged the S&P 500 by 2.6% per year over seven years. A good part of this lag can be traced not to stupidity or incompetence, but to the simple fact that trading stocks and hiring money managers and supervising them costs money. That's what William Fouse means when he says the monkeys eat too many of the bananas.

And there are probably far too many monkeys. Says Capital Guardian's Kirby: "There's always some guy out there who knocks the cover off the ball for the last five years. He waltzes into a presentation and the corporate staff says, 'Holy mackerel, he's beat the market by 6% annually!' and the guy gets hired to manage their money."

Take Boston's Batterymarch Financial Management, which from 1975-79 beat the market by an average of 10%. Pension funds were lining up to hand it money, and in less than ten years, its actively managed equity assets swelled to $10 billion by 1985.

"Then you have what's statistically called regression to the mean," says Kirby. In baseball terms that means a guy whose batting average is .500 may one week produce a .700 average, but eventually that performance will even out. Evening out means he will underperform the market in several years.

Kirby: "As soon as the manager regresses to the mean, the client fires that guy and gets the new guy who has done 6% over the market. It is so naive it's incredible."

True to Kirby's words, Batterymarch's special concentration in small- and medium-cap stocks fell out of favor in the late 1980s. In 1989, returns were 13.2%, versus the S&P 500's 31.5%. Panicked and disillusioned, the funds left in droves. Today Batterymarch has just $2.6 bil-

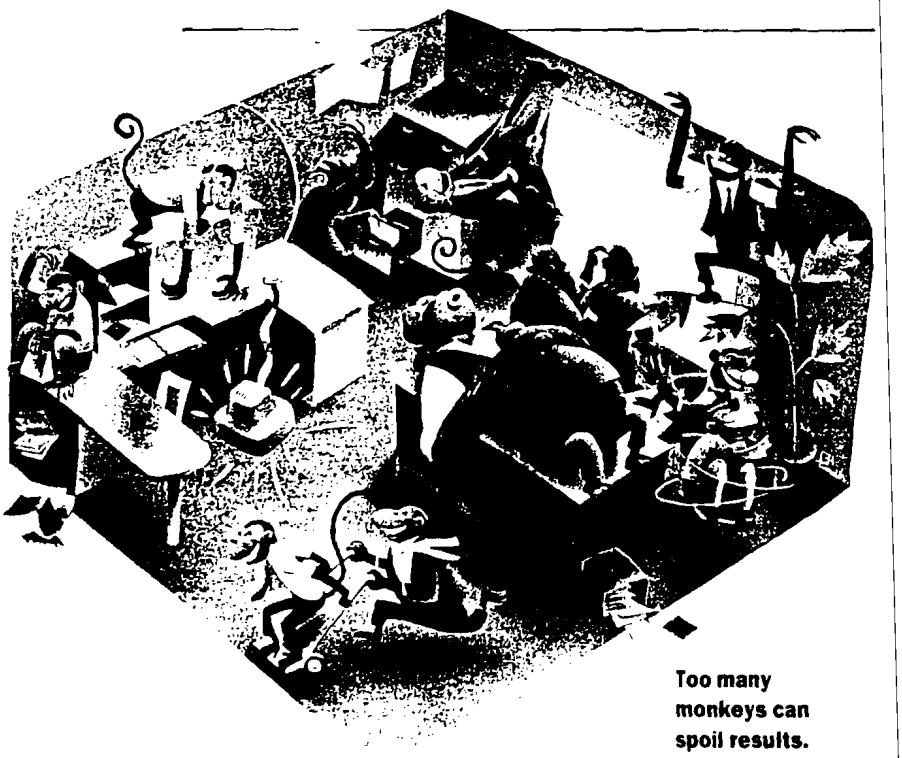
lion under management. But its performance record is beginning to turn up again, so the cycle continues.

The only real way to win is to break entirely out of the cycle, as General Mills has done. Instead of firing the stock picker who's down for the year, General Mills gives him more money, taking from the top performer. This approach requires courage on the part of the corporate client, but in General Mills' case it has produced one of the best long-term records for its $1.8 billion fund. Its 17% annualized equity return over the 15 years ending in 1992 compares with 15.4% for the S&P 500, and the fund's overall fund return of 15% per year puts it in the top 5% of all pension funds, as measured by SEI Corp., the consultant. "You've got to be willing to buy what's ugly and not care what others think," says David Van Benschoten, director of General Mills' investment management. "Too many funds chase what's trendy."

After spending two years talking with money managers and studying their results, a pair of anthropologists came to the not entirely surprising conclusion that the money runners were more concerned with keeping their customers contented than with beating the market. Professor William O'Barr of Duke University spent the early parts of his career studying coffee farmers in Tanzania. John Conley of the School of Law at the University of North Carolina studied rhesus monkeys in Puerto Rico. Recently, with the help of a grant from the Columbia Institutional Investor Project, they have been studying the people who manage pension funds.

Don't laugh. The two anthropologists visited nine pension sponsors with combined assets of over $200 billion. While O'Barr and Conley didn't know much about finance, they did know a lot about social organization, and what they learned about the pension fund business will not be reassuring to those executives who think their pension funds can beat the market if they can just pick the right geniuses to run the money, and damn the fees!

"What was shocking is the degree to which economic decision making had nothing to do with how they were managing the money," says Conley.



Too many monkeys can spoil results.

What did it have to do with? Typical was one unnamed corporate fund with $10 billion in assets. It had 21 investment managers pursuing all different kinds of investment strategies—low cap, high cap, aggressive growth, value, you name it. This was the fund's way of making sure that no matter which group of stocks was performing well at any given time, it would have a piece of that group. It seems never to have occurred to the fund's managers that they could have achieved the same results at far lower cost by investing in an index fund with low turnover and minimal fees.

Or, if it had occurred to them, perhaps they felt that they could not justify their own salaries if they simply did index investing and spent the day reading newspapers.

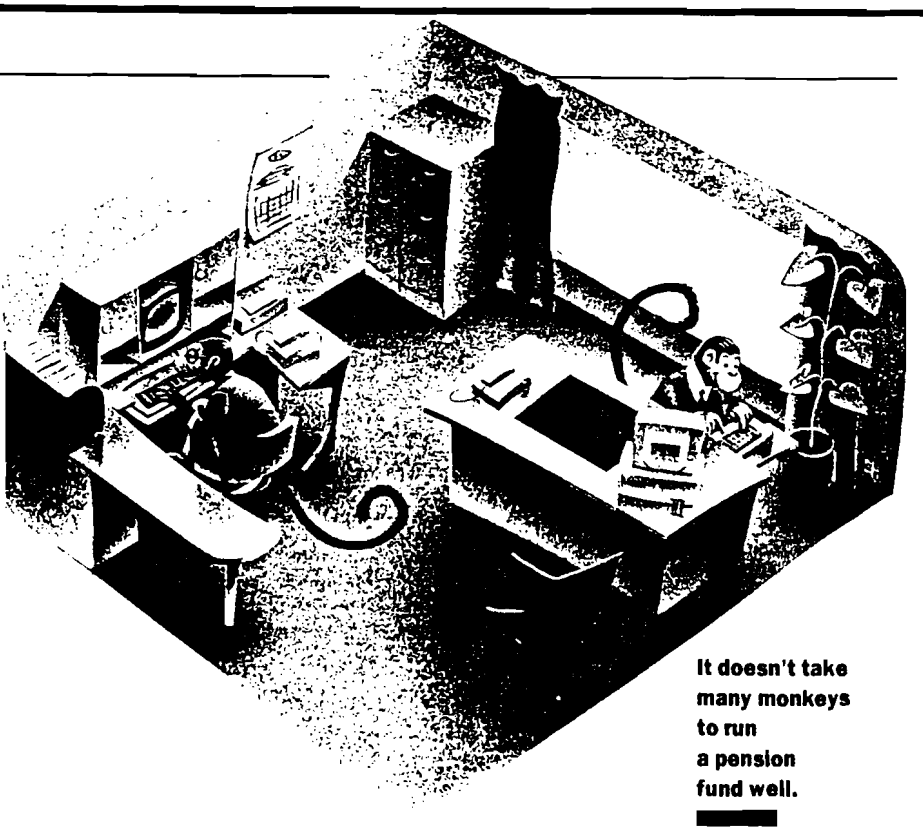
O'Barr and Conley wrote up their findings in a book, *Fortune and Folly* (Business One Irwin, $29.95), which has yet to sell many copies. The pair have been accused of poor research and a hidden political agenda, and it is true that neither of the authors is expert in markets or finance.

On the other hand, it is sometimes refreshing to have people from a different culture look at your own, and this is the value of O'Barr and Conley's anthropological analysis of institutional investing.

As the professors discovered, there's monkey nature and there's human nature. It is human nature to cover your behind. Outside money managers can be useful in this regard: If things go wrong, the pension manager can fire them, just as Stalin could shoot his generals if they lost a battle. And it is certainly against human nature to expect a pension executive to march into a boss' office and say, "You should fire me and my staff and buy an index fund."

FORBES columnist David Dreman is not one to advocate firing active managers and replacing them with an index fund—he runs an active money management firm. But Dreman has a theory why most pension sponsors are destined to underperform: "Investment managers try too hard to avoid any action displeasing to the client, but that avoidance is in conflict with sticking with an investment policy that is not in vogue but which might ultimately prove successful." Dreman believes—and a great deal of evidence supports his belief—that an investor does better in the long run by limiting himself to a tested method than by chasing whatever happens to be hot. But such discipline and self-confidence do not come naturally to very many pension plan sponsors, nor the money managers they fire.

Like General Mills, Polaroid's $1.2 billion pension fund has been a standout because its managers weren't afraid to stand apart from the crowd.



It doesn't take many monkeys to run a pension fund well.

In 1974, when indexing was brand new, Polaroid boldly decided to index its entire stock holdings. "It didn't make sense to me to have 50 managers, with manager No. 18 buying IBM and manager No. 37 selling it, so that all we incurred were transaction costs and management fees," says Philip Ruddick, director of Polaroid's treasury operations. Polaroid has stuck with its unconventional approach to pension fund management, spurning consultants and all they sell, and hasn't regretted it.

There are plenty of people around pressuring a fund manager to make changes. There's the board of directors, who may fuss if the fund has a couple of bad quarters. Then there are consultants, ever ready to help the pension manager pick his team of money managers—for a fee.

The big consultants are Frank Russell, Wilshire Associates and SEI Corp. They charge retainers of roughly $100,000 to $500,000 a year for funds with assets over a $1 billion. The fees are rarely paid out of a corporate budget but through soft dollars—the consultants ask the plan's money managers to direct their trades though certain brokerages, who then pay the consultants back in dollars. This soft-dollar reimbursement scheme in part explains the consultants' popularity, but their primary value appears more in helping defend the investment staff from its own committees.

Consulting also involves certain conflicts of interest. Rarely do the experts recommend indexing—it would put them out of business if everyone did it. Pension funds pay consultants for objective advice on which managers to hire, but the same consultants charge managers fees for measuring the managers' performance. A manager who doesn't buy the services is supposed to have an equal chance at getting a recommendation, but human nature is still human nature. There are plenty of stories about managers who are recommended by consultants on the grounds that the managers pay the consultants the biggest fees.

Another potential conflict: Many of the major consultants, including Frank Russell, Wilshire Associates and Evaluation Associates, also sell their own money management services, in competition with the managers they measure.

No great surprise, then, to learn that there is often an inverse relationship between the amount of time and money a company spends on pension fund management and the results it achieves.

The New Jersey Division of Investment invests $45 billion and spends a shade under $5 million a year on managing the money. The $75 billion California Public Employees Retirement System spends $150 million—that's 20 cents per $100 of assets in New Jersey, versus 1 cent per $100 in California. The California system, the famous Calpers, gets a lot of fawning ink for its role in monitoring management performance, but its own performance is mediocre. For all the extra dollars spent, California's performance lags New Jersey's by 1.5% a year on average over the last five years.

Or contrast the pension plans of two auto companies, GM and Ford Motor Co.

Gordon Binns, 64, who runs the $45 billion General Motors pension fund, is frequently called to Washington to testify on pension matters. He employs 70 money managers, has an additional staff of 70 and hands out lucrative business to the pension fund consultants. There's a little of everything—a Japanese equity manager, a high-yield and distressed-bond manager, an options and futures manager, a number of emerging markets fund managers and several venture capital fund managers.

The payoff? There hasn't been any. GM's pension funds produced an estimated 10% annualized return over the five years ending 1992. According to SEI Corp.'s measurement service, which tracks such numbers, GM's funds finished dead last when measured against the 33 funds in SEI's database with over $1 billion in them.

Compare this with Ford Motor's pension performance. Instead of a staff of 70, Ford has just 2 employees overseeing its $28 billion fund. Steering clear of specialty investments and consultants has kept its overhead down and returns up. Ford's 13.5% annualized five-year returns put it among the top 15% of like-size funds, as measured by SEI Corp.

Keith Ambachtsheer of Toronto's Cost Effectiveness Measurement Inc. analyzed 135 funds with a combined $700 billion in assets. His conclusion: There was no positive correlation between performance and money spent on staff, managers and high-priced advice to get it. In other words, a good deal of that $9 billion a year is wasted on people who aren't adding any real value. Remember that next time a money manager wants some of your fund's bananas. ■