RESEARCH

CAN PUBLIC FUNDS COMPETE?

Endowment funds and, to a lesser degree, corporate pension funds have had better risk-adjusted performance than public pension funds. This research examines factors that might explain this phenomenon. Differences in asset allocation and investment strategy appear to have played a role. Perhaps the more interesting result is the identification of factors such as staff compensation levels, governance, and investment culture that may also be a part of this performance.

We hear much of the differences in practice among investor types. We know, for example, endowments are heavier users of alternative investments than are pension funds, and public funds rely more heavily than others on passive management. Our literature is largely silent, however, on the question of whether particular fund types have outperformed others generally and whether particular practices have proven superior to others. Do endowments outperform pension funds after accounting for differences in risk? Do certain aspects of investment policy contribute to superior performance? And what about factors such as fund size, expense levels, staff size and compensation, and fund governance practices – do these factors have a systematic bearing on fund performance? The purpose of this research is to explore these issues to gain insight into best practices in institutional fund management.

Any empirical study is only as good as the data that underlies it. For the present purpose, the ideal dataset would include, in addition to return histories for a large sample of individual funds, detailed descriptions of their practices and circumstances over time. Unfortunately, the ideal dataset to make a comprehensive evaluation of inter-fund performance does not exist. Consequently, we have obtained data from several sources, integrating them as best we can. As a result, this study is far from definitive. Rather, it is at best a beginning: an attempt to frame the problem and identify factors that might reasonably be expected to have a bearing on fund performance.

The study begins with a comparison of the performance of three fund types – corporate pension funds, endowments (including foundation funds), and public funds. Table 1 shows the rates of return of the three fund types for two periods: 1987-2002 and 1995-2002. After analyzing the results for the longer period, we added the shorter one because doing so resulted in a materially larger sample while still encompassing major bull and bear markets.[1] Endowments produced the highest average rate of return during both periods and public funds the lowest. The annual return spread between endowments and public funds was approximately 0.5% (50 basis points) for both periods.

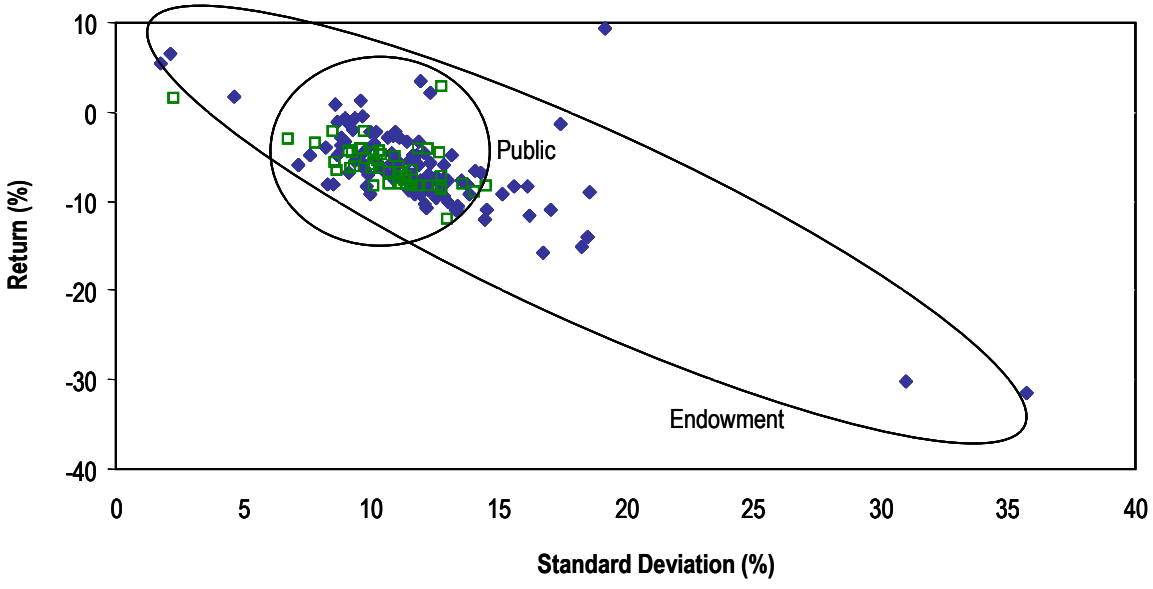
Table 1
Return and Risk for Fund Types

	1987 – 2002 (16 years)		1995 – 2002 (8 years)	
Fund Type	**Annual Return**	**Standard Deviation**	**Annual Return**	**Standard Deviation**
Endowment	9.17%	10.94%	8.91%	11.97%
Corporate	9.11	10.56	8.74	11.77
Public	8.63	10.14	8.38	11.20

Source: Russell/Mellon Analytical Services.

Table 1 reveals that while endowments earned the greatest returns, they also exhibited the greatest risk as measured by standard deviation of annual return. Figure 1, which focuses on performance during the bear market, illustrates that public funds not only operate at a lower risk level than endowments, their risk habitat is much smaller. Public funds generally clustered within a standard deviation range of 7% to 15%, while endowments ranged in standard deviation from less than 5% to more than 30%.

Figure 1
Public Funds Occupy a Smaller, More Conservative Risk Habitat than Endowments
April 2000–December 2002 (Bear Market)



What might account for public funds' more confined habitat? Some would say that, owing to greater public scrutiny, public funds are more concerned with peer practices and, consequently, have a tendency to herd. Another possible explanation has to do with the differing natures of public funds and endowment funds. Each public employee retirement system is a financial institution in its own right. And each has a common goal, which is to invest assets, plus future contributions, to fund pension obligations, which for large employee populations are relatively homogenous in their financial characteristics, e.g., duration and inflation sensitivity. On the other hand, resources of endowed institutions vary widely. For many colleges and universities, spending from endowment provides a small fraction – often less than 20% – of the institution's overall budget (other sources being tuition, fees, federal and/or state funding, etc.). For these institutions, there is also at work a diversification effect of income sources owing to imperfect correlation among them. For these reasons, the capacity of some educational endowments to bear investment risk is inherently great. For other institutions, such as foundations, the entire budget is usually funded by spending from the investment portfolio. It would be understandable if some of their investment policies were a good deal more conservative.

Whatever the explanation of differences in risk levels among fund types, it is important to take those differences into account in making performance comparisons. We did so using the Capital Asset Pricing Model, regressing an equal-weighted average of fund returns by type against a global market portfolio comprising all investable capital market assets.[2] The resulting risk-adjusted performance measure is the regression intercept or alpha. We cumulate the alphas for each fund type and plot the endowment and corporate series relative to the public series in Figure 2.

Figure 2 shows that endowment funds and, to a lesser degree, corporate pension funds outperformed public funds in the 1987-2002 period.

Figure 2
Cumulative Risk-Adjusted Return
1987-2002

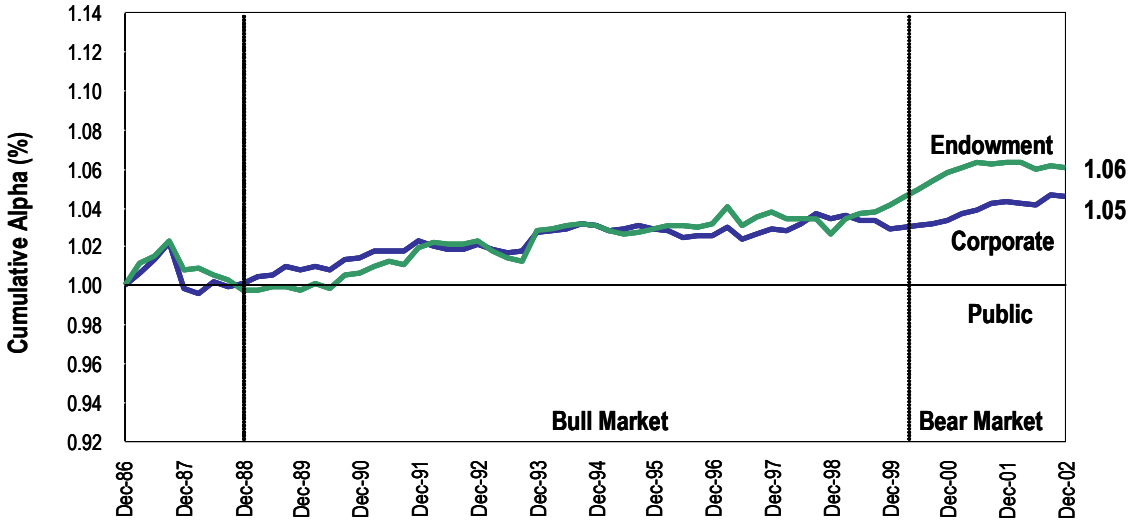


Table 2 provides similar results for 1995 through 2002 without using a market model. Here we have simply regressed the individual funds' returns on their standard deviations to develop an empirical return-risk relationship for each fund type. The average values indicated are the *y* values of the regressions at standard deviation of 12%, a reasonably central value for all three fund samples. Table 2 shows that endowments, especially, have outperformed public funds, earning an additional 55 basis points of risk-adjusted return per year over that eight-year period.

Table 2
Return Differentials by Fund Type
1995-2002

Average Return at Standard Deviation of 12%	Return Differentials
Public: 8.50%	Corporate over Public: 0.14 basis points
Corporate: 8.64%	Endowment over Corporate: 0.41 basis points*
Endowment: 9.05%	Endowment over Public: 0.55 basis points*

*Statistically significant differences.

ANALYZING DIFFERENCE IN RETURN

The data indicate that endowments have performed better than pension funds, and especially public funds, during the study period. The next step is to explore why this might have been the case. To this end, we have identified seven factors that could account for differences in return by fund type:

- *Asset Allocation.* This is the observed allocation across common asset classes. Asset allocation is well documented as the prime determinant of diversified portfolio performance.

- *Active versus Passive Management*. This is the average percentage of total fund assets that is managed actively.

- *Fund Size.* In some research, differentials in asset value among funds have explained differences in performance in some time periods.

- *Operating Expense.* This refers to overall cost structure. Funds with too high a cost of operation might be expected to underperform funds that are ostensibly more efficient.

- *Staff Compensation.* Funds that compensate their key investment professionals more highly arguably can attract the more capable staffs.

- *Staff Size.* Some funds might be better staffed to achieve positive risk-adjusted returns. Thus, staff size is considered a possible explanatory variable.

- *Governance and Culture.* Four elements of fund governance and management culture might have some impact. These include: (1) investment restrictions, (2) rigor of the fiduciary setting, (3) typical investment experience of board members, and (4) culture, meaning the extent to which fund investment could be characterized as *enterprising*.

Ideally, we would like to test each of these factors as an independent hypothesis, using statistical methods where possible. Some factors are statistically testable; most are not, owing to the absence of characteristic data at the individual fund level.

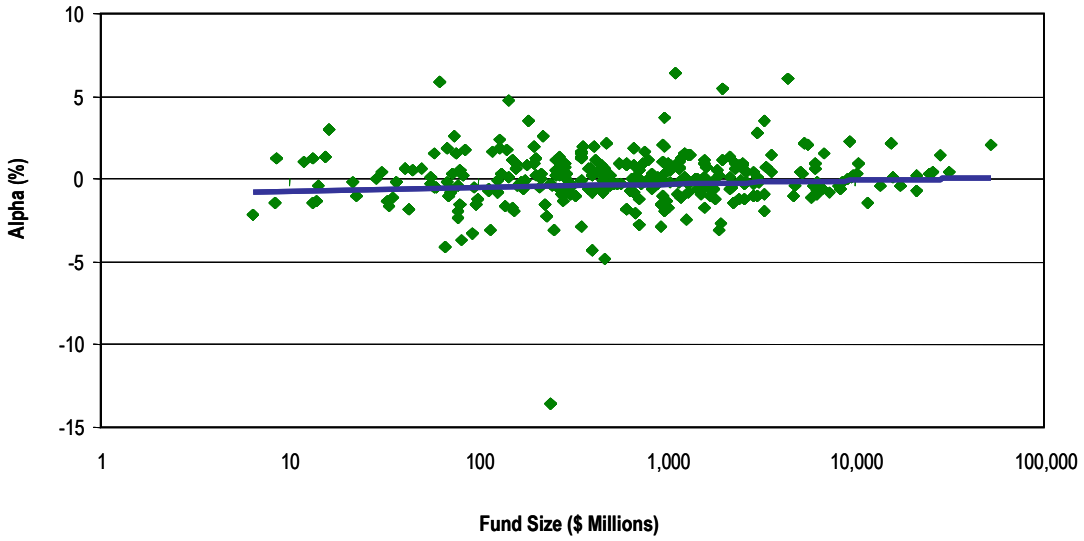
Discounted Factors

We find we can discount if not reject outright three of the seven factors in explaining performance differentials among fund types. These are fund size, operating expense, and staff size.

Fund Size. The average fund asset values are $10.0 billion for public funds, $1.4 billion for corporate funds, and $900 million for endowment funds.[3] We might expect alpha to be inversely related to fund size, recognizing the direct relationship of transaction cost and trade size. (See Beckers and Vaughn, 2001.) Under this theory, smaller funds are more nimble than larger ones because their trading costs are lower.

Figure 3 shows the relationship of alpha to fund asset size for all three types of fund. There is no statistical relationship between alpha and size. Separate regressions for each fund type produce the same result. Therefore, we reject fund size as an explanatory variable that would account for differences in alpha by fund type, at least for the period covered.

Figure 3
Risk-Adjusted Return by Fund Size, 1995-2002



Source: Russell/Mellon Analytical Services.

Operating Expense. Table 3 provides information on the cost of operation of the different fund types.

Table 3
Elements of Operating Expense

	Total Investment Expense (bps)	Salary and Administration (bps)
Public	34	5.1
Corporate	37	6.3
Endowment	53	9.7

Source: Greenwich Associates.

These results indicate that endowments, with the best performance, also have the highest level of operating expense and that public funds have the lowest expense level. Accordingly, we can discount, if not reject outright, the proposition that fund performance was adversely affected by higher levels of operating expense during this period.

Staff Size. Table 4 provides staffing information for the three fund types. More staff does not mean better returns. In fact, staff size is inversely related to alpha during this period. But the opposite picture emerges if we adjust staff size for asset size; here we see a direct relationship between staffing and class of performance. The latter interpretation, however, ignores entirely economies of scale in fund management, which strikes us as

wrong. Overall, we tend to discount staff size as a factor in explaining differentials in fund performance, at least until a clearer picture emerges.

Table 4
Full-Time-Equivalent Investment Staff Members

	Number of FTE Staff Members	Number of FTE Staffers Per Billion Dollars
Public	13.0	1.3
Corporate	3.9	2.8
Endowment	3.5	3.9

Source: Greenwich Associates.

Factors We Cannot Discount

To test each remaining factor rigorously with statistical methods, we need good characterization of the factor parameters at the individual fund level. For example, to test rigorously for the effects of asset allocation differences, we would require fairly detailed asset allocation data for each fund over time. Likewise, without an adequate description of factors relating to governance at the fund level, we cannot test rigorously for the influence of governance factors. Unfortunately, good-quality data of this type do not exist at the individual fund level. As a result, we must work with average characteristic values for the three fund types in some cases; in other cases, we lack even that and must rely on basic observation and experience.

Asset Allocation. Table 5 presents typical asset allocation figures for the three fund types in the year 2002. We tend to discount differences in asset allocation between public and corporate funds when we account for differences in *risk-adjusted* performance. While public funds hold 6 percentage points more in bonds, the performance results, which are risk-adjusted, effectively take account of this difference. Otherwise, the differences in asset allocation between public and corporate funds are negligible.

Table 5
Typical Asset Allocation and Passive Management Percentages, 2002

Asset Class	Corporate	Public	Endowment
U.S. Stocks	48%	44%	36%
International Stocks	16	15	13
Real Estate	3	4	4
Private Equity	3	3	8
Hedge Funds	0	0	8
Fixed Income	29	35	30

Source: Greenwich Associates.

There are significant differences between endowments and the other two fund types, notably in the areas of private equity and hedge funds. Table 6 indicates that a 5-percentage-point greater allocation to private equity could have had a very significant impact on the return of the typical endowment fund, especially if endowments were more heavily invested in venture capital. (Although solid data are lacking, casual observation suggests that endowments were indeed more heavily invested in venture capital than the other forms of private equity, such as buyouts, which have been the principal component of the private equity portfolios of public funds.) By way of a simple illustration, if we use the return data in Table 6, a five percentage point greater allocation to venture capital (at the expense of domestic equity) over the 1995-2002 period would have added 65 basis points of incremental return. (This figure is arrived at by multiplying the incremental annual return of venture capital over domestic equities of 1300 basis points by .05.) This approximates the roughly 50-basis-point difference in return between endowments and public funds reported earlier. This is a crude calculation, to be sure, but it serves to put into perspective the potential impact of venture capital investments during this period.

Table 6
Asset Class Returns, 1995-2002

Wilshire 5000	9.6%
Lehman Bonds	8.6
Venture Capital	22.6
All Private Equity (incl. buyouts)	14.1
Hedge Funds (funds of funds)	8.5

Sources: Venture Economics, Hedge Fund Research.

Caveats are in order regarding the potential impact of venture capital returns. Managed pricing plays a significant role in determining venture returns in the interim between cash flows. See Anson (2002). Managed pricing has the potential to distort venture returns, and we have no sure way of knowing the potential effect during this period. Mitigating the concern over managed pricing is anecdotal evidence that venture capital funds made extraordinarily large distributions during 2000. To the extent investors liquidated shares received rather than continuing to hold them, which most did, they realized their gains, ameliorating some of the concern with managed pricing.

Also noteworthy is the fact that the superior risk-adjusted return of endowments likely reflects a measurement bias in their favor. Managed-pricing conventions, which manifest themselves in positive autocorrelation of portfolio return, tend to dampen the observed volatility of private equity investments and hedge funds. To the extent this is true, it is fair to conclude that the observed volatility of endowments is understated, which means their risk-adjusted performance is overestimated. To correct for this we adjusted the Sharpe ratios of all funds in the sample for the presence of autocorrelation using the method described in Lo (2002). The results appear in Table 7. Adjusting standard deviations for autocorrelation does decrease endowments' Sharpe ratios more so than those of the other fund types. It does not, however, eliminate their advantage in risk-adjusted return.

Table 7
Sharpe Ratio Adjustment for Autocorrelation
1995-2002

	Average Sharpe Ratio		
Fund Type	**Raw**	**Adjusted**	**Difference**
Endowment	0.43	0.40	.03
Corporate	0.39	0.37	.02
Public	0.35	0.34	.01

We do not have good information regarding the timing of investors' hedge fund allocations during 1995-2002. The endowments' allocation obviously started smaller than 8% and grew to that level. This lack of knowledge, combined with the difficulty in generalizing about hedge fund performance, causes us to be reluctant to speculate on the effect of endowments' greater hedge fund investments.

Active versus Passive Management

Table 8 shows the median return of domestic equities by fund type (unadjusted for risk) and the percentage of *total* fund assets that were typically invested in one form of active management or another in 2002. Endowments' median return exceeded that of public funds by 0.85%. Endowments were also greater users of active management. And while the usage data for active management pertain to total fund, as opposed to domestic equities alone, we know that domestic equity is the asset class that accounts for the lion's share of passive investing for all fund types. Unfortunately, the 85-basis-point difference in return conflates two effects: systematic differences in the return of active and passive management during the period as well as differences in usage rates of active management. Nevertheless, these data tell the story that, during this period, active management appears to have systematically outperformed passive and, thus, more active management was better than less. Applying the same type of crude adjustment we applied above in gauging the potential impact of a greater allocation to venture capital, we see that an 85-basis-point return advantage in domestic equities translates to a typical return differential of 31 basis points at the total fund level. (This figure is arrived at by multiplying the incremental return of endowments' equities of 85 basis points by .36, the domestic equity percentage of endowments.) These admittedly rough calculations suggest that the use of active management, too, could account for a significant part of the difference in return between endowment and public funds.

Did endowments' greater use of active management contribute to the performance outcome? We cannot answer definitively; we can merely say that we cannot reject it as a factor.

Table 8
Domestic Equity Performance
1995-2002

	Median Return for Total Domestic Equities (Active and Passive Combined)	Percentage of Total Fund Assets Actively Managed
Endowment	10.61%	91%
Corporate	10.02	84
Public	9.76	74

Source: Russell/Mellon Analytical Services, Greenwich Associates.

It is possible that the recent bear market accounts, at least in part, for these results. The years 1995-2002 culminated in a three-year market decline. Active management generally does better in bear markets owing to the tendency of managers to hold some cash on average: In up markets cash is a drag, and in down markets it is a buffer. By way of illustration, in the six up-market years 1994-1999, an average of 77% of equity mutual funds underperformed the S&P 500, whereas in the three down-market years that followed, an average of 47% underperformed.[4] For this reason, the positive performance advantage associated with active management may be, to some extent, an artifact of the 1995-2002 period, which ends in a major bear market. This inference is supported by Cost Effectiveness Measurement, Inc., whose recent studies indicate that more active management has generally been better. Their recent findings, however, differ from their findings in earlier years, when their data favored the opposite conclusion.[5]

Staff Compensation

According to Greenwich Associates, there are significant differences in the average compensation of investment professionals for the three fund types. Corporate funds pay investment professionals 33% more than do public funds. Endowments pay 66% more, on average, than public funds.[6] Although we cannot establish a linkage between the two, we cannot reject differences in compensation levels as a possible factor that explains differences in fund performance.

Governance and Cultural Factors

One of the least studied aspects of institutional investment management is how various governance and cultural factors might influence investment outcomes. These are largely intangibles relating to (1) freedom of action, (2) board-level expertise, and (3) and the extent to which fund investment could be characterized as enterprising. Unfortunately, these factors do not lend themselves readily to quantification at the individual fund level in a way that permits rigorous analysis. Nevertheless, we know from experience there are differences among fund types in their governance and culture. These are the factors we considered:

- *Restrictions.* Public funds tend to be the most restricted in their investment activities. They face statutory as well as board-imposed restrictions. The most common form of restriction is precluding certain investments or investment activities; others are designed to encourage targeted (in-state) investments or affirmative action. That public funds are subject to freedom of information laws constitutes an additional restriction – a restriction on maintaining proprietary information. The latter is proving vexing to many public funds in their venture capital investing. Corporate funds are subject to party-in-interest restrictions under ERISA. Endowment funds operate largely free of investment restrictions.

- *Fiduciary Setting.* Public and corporate funds operate under strict fiduciary standards. Corporate funds are governed by ERISA and subject to its enforcement through the U.S. Department of Labor. While a formal enforcement apparatus does not exist in the public sector, increasingly the fiduciary standards there are identical to ERISA standards. Endowments operate in a comparatively relaxed fiduciary environment. A paucity of applicable case law is testimony to this observation.

- *Trustee Investment Experience.* This tends to be greatest for endowments, which have the luxury of selecting from among their alumni investment experts to sit on investment committees, even if they are not trustees. At the other end of the spectrum, the vast majority of public fund boards are made up of laypeople with respect to investment.

- *Culture.* In our experience, endowments are the most enterprising and results-oriented of the three fund types. Public funds, given their visibility and public accountability, are the most conservative, process-oriented, and politically sensitive.

It is tempting to speculate as to the potential effect of these differences in the less quantitative aspects of fund management. All of these factors suggest that endowments by their very nature may have greater performance potential than public funds. While these factors *may* have a bearing on the superior performance of endowments, much more work needs to be done before we can establish a critical link between governance and cultural factors and fund performance.

Summary

Public funds have underperformed corporate and endowment funds for more than a decade, even after adjusting for differences in risk. Endowments' greater allocation to private equity is a likely contributor to this outcome. Greater use of active management by corporate and endowment funds also appears to have helped during the period of this study. The effect of differences in staff compensation levels and governance/cultural factors is not currently testable, but observed variations for these factors are logically consistent with recent performance differences. These factors remain plausible contributors to performance differences.

ENHANCING COMPETITIVENESS

Fundamental differences exist among classes of institutional investors. These include differences in investment objective and risk tolerance, portfolio size, the application of fiduciary standards, and the realities of governance. In making performance comparisons, it is important to recognize that each investor type must operate within its own sphere, just as the leopard must live with its spots. That said, it behooves each investor to understand its inherent competitive advantages and disadvantages, and to tailor its investment approach accordingly. At the same time, each investor should seek to identify ways in which it can improve its competitiveness within the latitude available to it.

In this spirit, we offer public fund trustees several suggestions for building competitiveness:

1. *Continue to base asset allocation on intrinsic considerations.* This means that investment policy should be based on a rigorous evaluation of the needs of the plan. Of primary interest should be the nature of the underlying liability (its duration, growth rate, and inflation sensitivity), funded status, prospects for future funding, and liquidity requirements. Comparisons with the performance and practices of other investors are useful, but they should not be primary drivers of investment policy.

2. *Play to strengths.* Important competitive advantages and disadvantages of public funds derive from their relatively large size. As a result of economies of scale that are possible, they can operate at extremely low cost. Size also dictates that some asset classes are more suitable than others for public funds. In addition to all the publicly-traded areas of the market, real estate is a logical area for public funds. Large portfolio size facilitates diversification among large, "lumpy" properties as well as control over portfolio management functions; large size also permits a very competitive cost structure. Private equity, on the other hand, is an area of comparative disadvantage for public funds. Owing to their large size and the very small size of the private equity market, public funds tend to invest more heavily in buyout funds – and the large buyout funds, at that – than in venture capital funds. Moreover, their public nature can compromise their capacity for confidential dealing with some private equity managers, who do not want particulars of their portfolio companies and exit strategies falling into the public domain. Likewise, hedge funds, which are a form of hyper-active management, often in less liquid market sectors, are not a natural fit within the portfolios of mega-funds. The comparative advantage in all forms of active management is with the smaller portfolio, all else the same.

3. *Indexing remains a good way to get asset class returns and effect diversification.* Sharpe (1991) reminds us that, net of costs, the average actively managed dollar *must* underperform the average passively managed dollar, and for this reason index funds fairly consistently outperform more than half of the managers for a given class of active management. Malkiel (2003) provides empirical support for this observation. He reports that 60% to 90% of active managers underperformed their benchmarks in various domestic and international stock and bond categories for a recent ten-year period.

4. *Re-examine boundaries that exist within the portfolio.* Public funds can achieve satisfactory results using index funds only. Virtually all, however, attempt to achieve *superior* performance through various forms of active management. Our research (Ennis, 2001) indicates that most funds would benefit from lessening their reliance on narrow specialty management and broadening mandates in their active investing. Broader, more flexible mandates acknowledge that exploiting the lion's share of value-added opportunities necessitates moving funds among market sectors and capitalization ranges. Others have shown that the long-only constraint hurts portfolio efficiency. (See Brush, 1997, Grinold and Kahn, 2000, and Jacobs and Levy, 1993). In the same vein, other research indicates that *sector* factors are having a greater impact on stock pricing internationally than *country* factors, a sign of ongoing global market integration. (See Cavaglia, Brightman and Aked, 2000, and Hopkins and Miller, 2001). This, in turn, challenges us to consider *global* equity portfolio management as an alternative to partitioned domestic and international mandates. In short, successful efforts to earn alpha may necessitate crossing boundaries that have been built into most portfolios, and skillful, resourceful managers should be free to find value where it lies. The growing acceptance of hedge fund investing on the part of institutional investors is testimony to their warming to this view of the world of investment opportunity.

5. De-emphasize strict organization of staff resources by asset class; shift budgetary resources up and to the center. It has become customary for large public funds to organize the bulk of their professional resources along asset class lines. Strict adherence to this organizational approach contributes to rigidity in asset allocation: It is difficult for assets to cross boundaries when the people who manage them aren't in a position to do so.

6. Strive to bring staff compensation in line with that of the private sector. Examine the trade-off between staff size and compensation. A dollar of public pension fund assets is worth the same as a dollar of endowment assets. To the extent that compensation levels in the public sector lag those in the private sector, public funds will be at a competitive disadvantage in recruiting the most valuable investment professionals.

In this regard, funds are increasingly evaluating *incentive compensation* plans to bridge the compensation gap. While incentive compensation arrangements are fraught with agency issues, this may be the only way to approach anything like compensation parity.

Public funds should make a frank assessment of the trade-off between staff size, which does not appear to be a factor in value-added investing, and staff compensation, which may be a factor. This is a sensitive issue, to be sure. But it is possible that fully competitive compensation for key top-level positions could in many cases be realized without increasing overall staff expense through judicious reductions in intermediate and junior staff positions.

7. *Delegate greater manager selection authority to staff.* It will not be easy for public funds to fundamentally alter the nature of their governance process or their investment culture. That said, funds should re-examine every aspect of their operation to see if it is possible to free up and streamline decision-making.

   One area for this is manager selection. Many funds still have a committee of trustees make manager hiring and firing decisions. Committees, especially committees of laypeople, are not equipped to distinguish skillful investment management from a good sales pitch. Indexing is almost certainly a better strategy than hiring and firing active managers by committee. Funds should strive to maximize the delegation of manager selection and retention to staff.

Comparisons with other public funds and other types of investment funds can furnish decision-makers with valuable perspective as they work to enhance their competitiveness. Through careful such analysis, while remaining true to their nature, public fund decision-makers can better understand their own strengths and weakness. And in the process, they may discover ways to enhance their fund's competitiveness.

The research described here only scratches the surface in identifying best practices through inter-fund comparisons. Much work remains ahead of us.

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ENDNOTES

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[1] The 1987-2002 sample includes 74 corporate, 27 endowment and 14 public funds. The 1995-2002 sample includes 178, 73, and 45 funds, respectively. The data source is Russell/Mellon Analytical Services, which reports only "gross" returns. Returns used in the analysis are net of average fees reported by Greenwich Associates for the respective fund types, viz., 37, 53, and 34 basis points.

[2] The world market portfolio series is maintained by Ennis, Knupp and Associates using data from UBS Asset Management and Venture Economics.

[3] Greenwich Associates.

[4] Lipper, The Vanguard Group.

[5] The Cost Effectiveness Measurement, Inc., Toronto, ON, 2002 survey covers 137 U.S. funds with aggregate assets of $1.4 trillion. See Section 2, Reserach.

[6] Greenwich Associates.