

Does Scale Matter for Public Sector Defined Benefit Plans?

*Evidence of the Relationship Among Size,
Investment Return and Plan Expense*

April 2009



Great Public Schools for Every Student

The National Education Association (NEA) is the nation's largest professional employee organization, representing 3.2 million members at every level of education—from pre-school to university graduate programs. NEA has affiliate organizations in every state and in more than 14,000 communities across the United States.

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The NEA Representative Assembly approved the following New Business Item (NBI 2008-11) in July 2008:

“NEA will compare the historical rates of return of selected small public sector defined benefit pension plans to those of selected larger public defined benefit pension plans. NEA will also compare the administrative costs of the smaller and larger plans. Based on the quality of the data available, NEA will draw upon existing data series from multiple sources (particularly those that furnish risk-adjusted results) as well as utilizing direct analysis of specific plans’ investment returns and administrative cost. NEA will then analyze the results to see if conclusions can be drawn about the relationship.”

This report was commissioned by NEA to respond to NBI 2008-11 by seeking data from multiple sources on historical rates of return of selected small and larger public defined benefit pension plans and the administrative costs of the plans to determine if conclusions could be made about the relationship between the size of the investment pool and rates of return and administrative costs.

Acknowledgements: The NEA expresses its deep appreciation to the author of this report, Randy Barber of the Center for Economic Organizing. We would like to thank the Illinois Education Association for the information they provided. In addition, we thank the following individuals who were particularly helpful: Keith Brainard (National Association of State Retirement Administrators), Allan Emkin (Pension Consulting Alliance), Kelly Haverstick (Center for Retirement Research, Boston College), Brian Johnson and Brett Barkley (Wilshire Associates), and Terrie Miller and Alan Torrance (CEM Benchmarking).

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Executive Summary

While there appears to be strong evidence that scale (or size) can increase the cost-effectiveness of a retirement system—where all other factors being equal, a larger system can be expected to have lower investment and administrative unit costs—there are dynamics that accompany scale that can undermine these efficiencies. These dynamics can broadly be characterized as the increased complexity, expanded mission, broader alternatives, and the potential for decreased responsiveness that appear to accompany larger scale. This is not to say that these dynamics outweigh the benefits of scale, but they should be recognized and their impacts mitigated to the extent feasible.

There are at least four broad areas that must be considered in evaluating the relative costs and efficiencies of smaller versus larger retirement systems:

- Investment performance
 - Typically, larger systems are able to more effectively diversify their portfolios and produce higher total returns; however, the recent financial downturn seems to have favored smaller, probably less broadly diversified, retirement system investors.
- Investment management costs
 - Larger systems are clearly able to obtain lower fees and generally achieve lower investment management costs, all other things held constant; however, larger systems are also in a position to place assets in a range of “alternative” investment options which not only promise higher returns (sometimes but not always achieved) but also carry with them much higher investment management fees as well.
- Administrative costs
 - Again, larger systems generally have lower per-participant costs, all things being equal, but the combination of increased complexity and expanded mission (increased and more complex tasks) can obviate the cost advantage that larger systems might enjoy.
- Governance structure and responsiveness to participant needs
 - Larger systems—particularly those encompassing multiple plans and participant groups—risk becoming less responsive to the needs of participants than smaller systems that are responsible for a single participant group; moreover, the ability of retirement systems to provide acceptable levels of service to participants appears to be unrelated to size.

There also appears to be a point of diminishing returns, with respect to assets and participant population, but where such a point might be is not at all clear.

Finally, the potential benefits of prospective retirement system consolidation should be carefully evaluated in the light of transition costs, integration risks, and the impact, if any, on participant involvement in fund governance.

Preface

NEA retained consultant Randy Barber to obtain and evaluate data on the relative rates of return and administrative costs of selected small and larger public defined benefit pension plans. The goal of this analysis is to determine if conclusions can be made about the relationship between the size and rates of return and administrative costs, and to summarize this research in a report.

The initial phase of this analysis included:

- Performing a literature search to identify: a) major analyses of the relative financial and administrative benefits attributable to small and large public sector defined benefit pension plans, and b) relevant recent proposals and developments;
- Contacting key academic centers specializing in the study of the administration and investment of public employee pension plans;
- Identifying databases containing information for the more in-depth analysis that is to follow; and,
- Determining the best methods for gaining access to these data, including obtaining the cooperation of public funds participating in cooperative data pooling arrangements.¹

After evaluating the results of this initial phase, data from four key sources was obtained:

- Wilshire Associates' five- and ten-year total return performance data from its Trust Universe Comparison Service (TUCS), by funds with less than \$1 billion, over \$1 billion and over \$5 billion in assets (2008 data);
- Administrative and investment cost details for 95 public retirement systems from the National Association of State Retirement Administrators (NASRA), with a range of \$319 million to \$152 billion in assets and 2,377 to 1,281,895 active and retired participants (2007 data);²
- Administrative and investment cost details for 194 state and local retirement plans from the Center For Retirement Research at Boston College (CRR), with a range of \$5 million to \$212 billion in assets and 63 to 1,490,172 active, inactive vested and retired participants (2006 data);³ and,
- A specially-commissioned analysis by CEM Benchmarking, Inc. of the effects of membership size on administrative costs and levels of member services, drawn from the firm's detailed data on 44 US and 45 non-US defined benefit plans (primarily 2008 data with some 2006 and 2007 data).

¹ Mr. Barber also had extensive interactions with the staff of the Illinois Education Association, which was engaged in detailed discussions and analysis of a pending proposal by the state's Treasurer to consolidate the assets, investment functions, and financial governance of the Teachers Retirement System with those of the Illinois State Board of Investments and the State University Retirement System.

² This report presents investment and administrative expense data for 88 state retirement plans, due to missing data for seven of the plans.

³ This report presents investment expense data for 184 plans and administrative expense data for 169 plans, due to missing data for certain plans.

I. Overview

The analysis in this report was undertaken in the midst of growing calls for the consolidation of public pension plans within states and even some cities.⁴ Something approaching a *political* consensus seems to be emerging that combining two or more plans into a single larger entity will produce significant economies of scale.

Obviously, these pressures are understandable during a period of extreme fiscal stress for sponsors and enormous market declines. However, it is not clear that the hoped-for economies of scale will actually materialize, and, if they do, under what circumstances they will be available. In addition, there are concerns that added size will be accompanied by less positive developments, including a loss of responsiveness and even reduced or eliminated participant representation in plan governance.

This analysis is designed to explore these questions and concerns.

But first, there is the matter of definition: what are “small” and “large” plans in the context of some of the largest investment pools in the world? Size can and should be measured by assets as well as by total participants (or members). As we will see, some researchers attempt to delineate plans by size, while others simply group them in quartiles, ranging from the smallest to largest (either by assets or membership). Both approaches produce useful results, helping to identify trends where they exist, as well as where they don’t.

One would think that obtaining data on the relationship between the size of public pension plan assets and investment performance would be a fairly straightforward task. However, it is not. Most non-proprietary sources report investment performance on a total (or gross) return basis, excluding investment fees, although we were able to obtain one analysis that attempts to calculate public fund investment returns on a net basis.

One of the arguments in favor of creating larger plans through consolidation is that the resulting plans would be in a position to more broadly diversify their portfolios in a cost-effective manner. As we will see, while larger funds do appear to be more diversified with generally lower investment costs, there are some important caveats. Smaller funds seem to have fared somewhat better in the recent financial meltdown, probably because of relatively more conservative portfolio allocations. In addition, there is some evidence that the very largest funds incur slightly higher investment costs measured as a percentage of assets, most likely because they are investing in highly specialized (and more expensive) asset classes such as private equity, hedge funds and the like. While it is possible to compare investment expenses among plans of different sizes, comparative analyses of public pension plan asset allocations and risk-adjusted returns, ranked by plan size, have been elusive.

⁴ A non-exhaustive list of proposals to consolidate public employee retirement plans includes: Arkansas (<http://www.pionline.com/apps/pbcs.dll/article?AID=/20090306/DAILYREG/903069987/1004/PIIssueAlert01>), Colorado (http://www.denverpost.com/news/ci_12195235), Illinois (<http://archives.chicagotribune.com/2008/dec/01/news/chi-ap-il-pensionpools>), Indiana (<http://www.pionline.com/apps/pbcs.dll/article?AID=/20090415/DAILYREG/904159975>), http://www.ibj.com/html/detail_page.asp?content=32567), Louisiana (<http://www.pionline.com/apps/pbcs.dll/article?AID=/20090414/DAILYREG/904149963/1034/PIDailyUpdate>), Minnesota (<http://www.legal-ledger.com/item.cfm?recID=11309>), and Minneapolis (<http://www.startribune.com/local/41241762.html>).

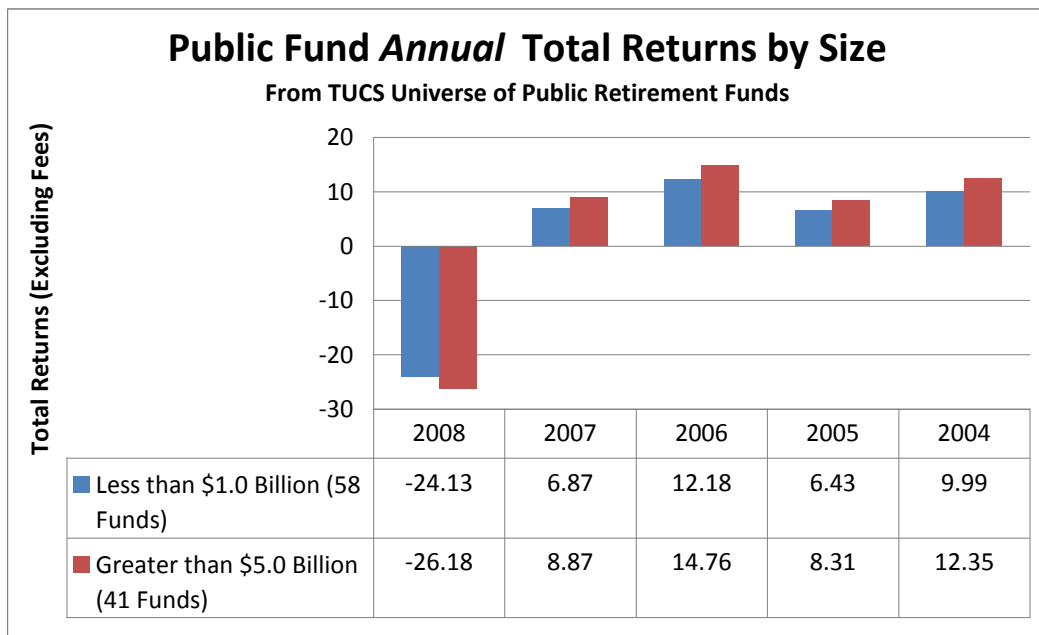
Finally, there are administrative costs, which can reflect a quite wide variety of tasks that plans undertake, from “simple” recordkeeping and actuarial functions, to investment and retirement counseling for members, to services for participating employers. In the course of this analysis, it became clear that while some systems undertake fairly “bare bones” administrative functions, others are evolving into almost full-service financial institutions for their members and sponsors. Other than one source, which was commissioned to perform a customized analysis, the best data available provides information on total administrative costs, but not the functions that are associated with them.

Because there is no single combined source of analysis of all aspects of public pension system financial performance, this report separately examines *investment returns*, *investment expenses*, and *administrative costs*, by plan size.

II. Investment Performance

While many consulting firms collect data on public pension fund investment performance (often as part of their advisory services), by far the most prominent is Wilshire Associates and its Trust Universe Comparison Service (TUCS). Wilshire agreed to provide an analysis of total public fund returns over the past five and ten years, separately for all plans in its universe, for those with assets below \$1 billion, with assets above \$1 billion and with assets above \$5 billion.⁵ The full TUCS report can be found as *Attachment 1*.⁶

The chart below, derived from the TUCS data, reflects total returns (i.e. excluding any investment fees paid) from Wilshire’s universe of public pension funds for each of the five-years, 2004-2008. Total returns by plan size are reported for 58 funds with assets below \$1 billion (the “small” plans) and 41 plans with assets greater than \$5 billion (the “large” plans).



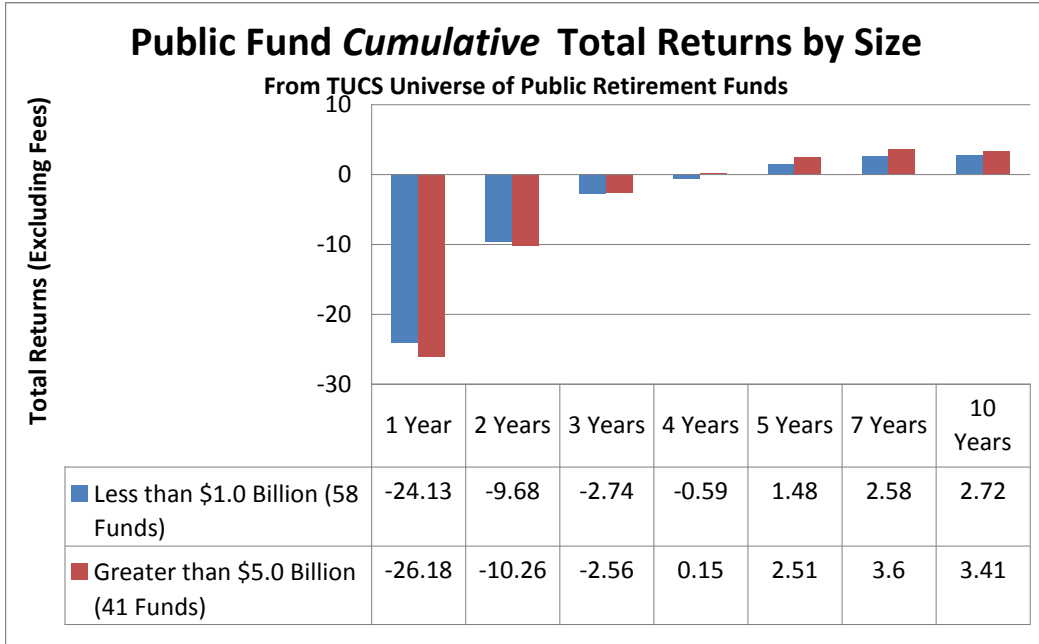
Source: Public Fund Performance Analysis, December 31, 2008; Wilshire Associates, Trust Universe Comparison Service (TUCS)

Needless to say, 2008 was a very unusual year for pension fund investors, one which no one wishes to repeat. Still, the TUCS data reveals that smaller plans outperformed larger ones by about two percentage points during the year. However, in the four previous years (which all yielded positive returns), larger plans outperformed smaller ones by roughly two percentage points.

The next TUCS-derived chart reflects *cumulative* total returns for the 1, 2, 3, 4, 5, 7, and ten year periods ending December 31, 2008.

⁵ For the purposes of this analysis, only the TUCS data for plans below \$1 billion in assets (“small” plans) and with assets over \$5 billion (“large” plans) have been considered.

⁶ NEA would like to thank Wilshire for providing this data without limitation to its use, other than this acknowledgement.



Source: Public Fund Performance Analysis, December 31, 2008; Wilshire Associates, Trust Universe Comparison Service (TUCS)

The effects of the poorer relative performance of the larger funds is evident in the first three years’ cumulative investment returns, while the larger funds’ results gradually improve relative to those of the smaller funds for years 4 through 7. They narrow somewhat, however, in the ten year cumulative measures, probably reflecting the impact of the so-called “dot-com bust” on the less-conservatively invested larger plans.

We turn now to a March 2008 analysis published by the Boston College Center for Retirement Research (CRR).⁷ While the data upon which the chart on the next page relies is somewhat older and has some other drawbacks, CRR has calculated the net investment returns (including fees) for a universe representing nearly 99 percent of the total assets held by state and local public pension plans.⁸

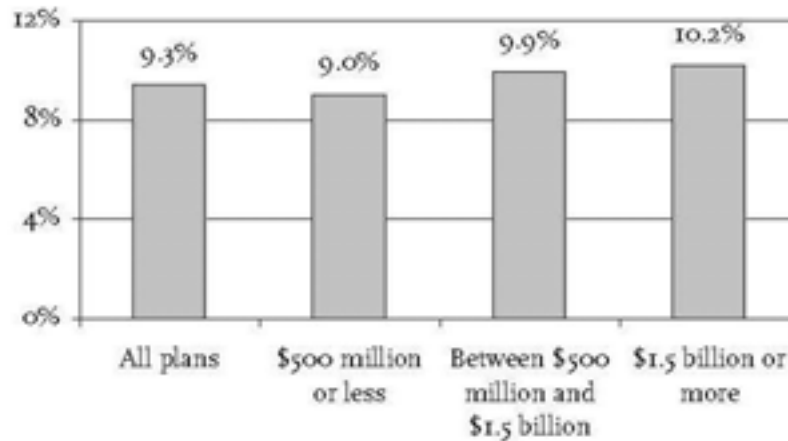
As can be seen in the chart (“Figure 6. Median Real Returns of State and Local Plans, by Size, 1994-2004”), the authors divided plans by asset size into three groups, those with \$500 million or less in assets, those with between \$500 million and \$1.5 billion, and those with assets in excess of \$1.5 billion.

⁷ “What Do We Know About the Universe of State and Local Plans? Alicia H. Munnell, Kelly Haverstick, Mauricio Soto, and Jean-Pierre Aubry; Center for Retirement Research, Boston College, March 2008

Also published by the Center for State & Local Government Excellence as an Issue Brief, March 2008

⁸ The CRR calculations cover the period 1994-2004 for 2,670 state and local retirement plans, based on the U.S. Census Bureau’s *Employee-Retirement Systems*.

FIGURE 6. MEDIAN REAL RETURNS OF STATE AND LOCAL PLANS, BY SIZE, 1994-2004



“Returns among public plans,” the authors conclude, “show that size is generally important—the larger the plan, the higher the return.” Indeed, a 1.2 percentage point advantage over eleven years for plans with more than \$1.5 billion over those with less than \$500 million certainly reinforces the case that larger plans are able to achieve greater net returns than are smaller ones.

One needs to be cautious when drawing conclusions from the TUCS and CRR analyses of “small” and “large” plan performance. Probably because of the relative large number of truly very small plans that they have in their data sets, both analyses set a lower boundary for its largest group that is smaller than almost all state-level public pension plans and many municipal and county plans in urban areas. They assign plans to their “large” plan group that would almost certainly be defined as “small” in most other contexts. Thus, it seems possible that the superior returns reported for the TUCS and CRR “large” groups actually capture some of the differences between small and *very small* plans.

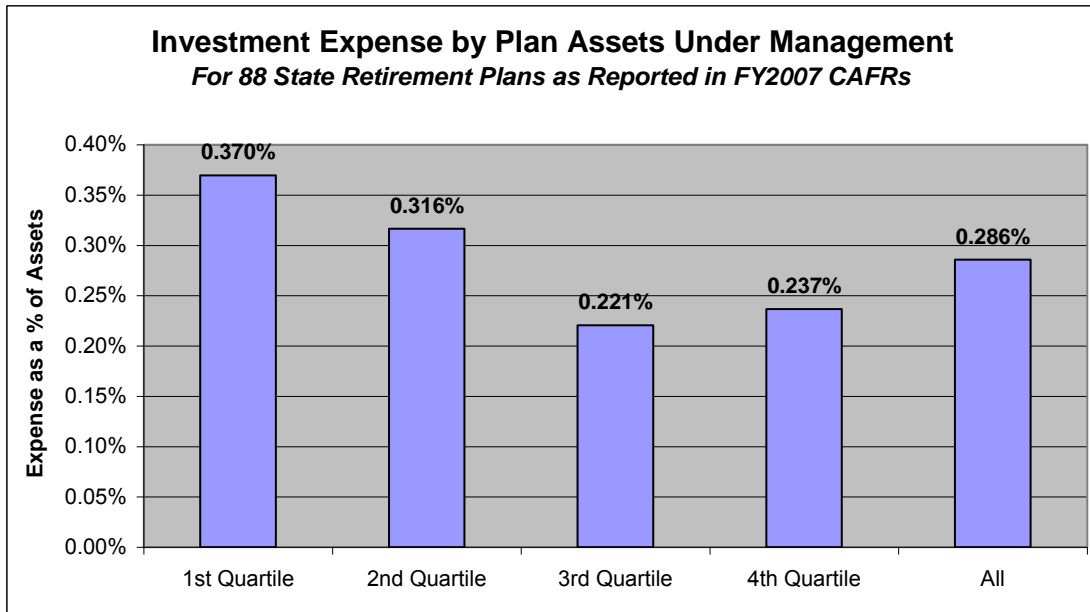
Such relatively minor quibbles aside, the TUCS data is an important resource for comparing the earnings of small versus large plans, and the CRR calculations are the only publicly available analysis identified that reported *net* investment performance of public pension plans by size.

Key finding: *Except in a down market, larger pension systems appear to obtain somewhat better investment results than do smaller systems—both on a total return and net return basis.*

III. Investment Management Costs

While *net* returns are obviously the “bottom line” when judging the impact of scale on investment performance, much better data is available on fees and related expenses that public pension funds incur. This is because almost all produce more-or-less standardized data via Comprehensive Annual Financial Reports (CAFRs).⁹

The National Association of State Retirement Administrators (NASRA) collects, verifies, and constantly updates a wide range of data from public pension plan CAFRs.¹⁰ The chart below has been extracted from *Attachment 2* and is based on this NASRA data set. It reflects the reported investment expense incurred by 88 state retirement plans (including a few large municipal and county plans) by quartile, from smallest to largest.



Assets By Quartile	1st	2nd	3rd	4th	All
Average (\$Billion)	\$3.3	\$10.1	\$21.6	\$83.2	\$29.6
Median (\$Billion)	\$3.0	\$10.3	\$20.4	\$65.1	\$13.7
Funds	22	22	22	22	88

Source: National Association of State Retirement Administrators (NASRA)

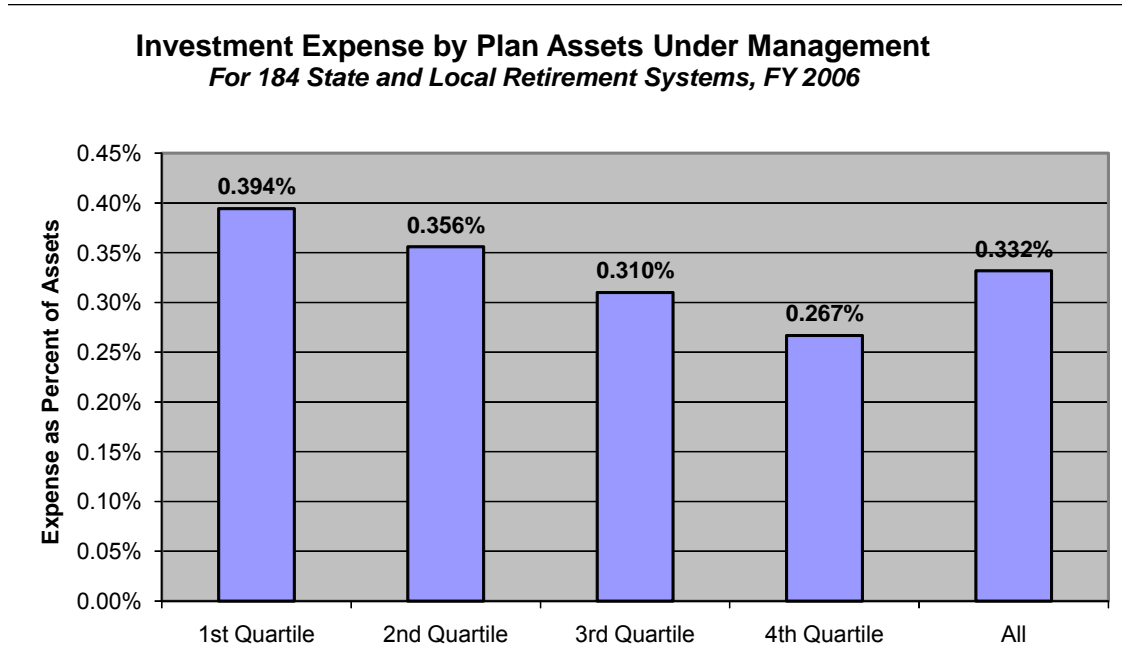
As expected, investment management expenses decline as scale increases, *except for the largest quartile*, which has slightly higher investment costs than the next-largest quartile (as measured by a percent of assets). This is probably due to differences in asset mix, with the largest pension plans investing in a larger proportion of more costly “alternative” investment options, which in theory at least

⁹ As with all theoretically standardized reporting, there are issues relating to definitional consistency and the completeness of data. However, the CAFRs are by far the most comprehensive and accessible source of information about public retirement plans.

¹⁰ NASRA maintains an extensive data set based on information collected from CAFRs from all state-administered retirement systems, as well as from selected larger municipal and county-level plans. The charts in Attachment 2 were derived from a spreadsheet containing selected data points from 95 public retirement systems, with a range of \$319 million to \$152 billion in assets and 2,377 to 1,281,895 active and retired participants.

compensate investors for higher costs by producing higher “expected” returns. This also may reflect diminishing returns from economies of scale among the very largest plans.¹¹

The next chart, below, was extracted from *Attachment 3*. It is based on state and local retirement system data maintained by the Center for Retirement Research at Boston College.¹²



Assets / Quartile	1st	2nd	3rd	4th	All
Average (\$Billion)	\$0.4	\$2.7	\$9.0	\$42.8	\$13.7
Median (\$Billion)	\$0.4	\$2.3	\$8.3	\$24.6	\$5.1
Funds	46	46	46	46	184

Source: Boston College, Center for Retirement Research

While there are significant similarities between the CRR and NASRA results (investment costs decline with scale), the former does not reflect the slight increase for the largest quartile.¹³ This may be due to a

¹¹ Expenses for investment management range from extremely low fees (measured in a few hundredths of a percentage point) through investment products that carry very high fees based on the promise of outsized returns. An example of the former would be “passive” investments in index funds and similar vehicles which merely attempt to reflect the composition of the market without any effort to outperform it. Many large retirement systems manage part or all of their passive investment portfolio in-house, which often reduces costs even more. An example of the latter would be the so-called “2 and 20” charged for investment vehicles such as hedge funds, where a typical annual fee is 2 percent of assets under management, plus a performance fee of 20 percent of net gains realized by investors when they cash out. In the light of huge losses experienced by investors in highly complex and very simple vehicles alike, premium fees such as the 2 and 20 are coming under sustained attack from major public pension fund investors.

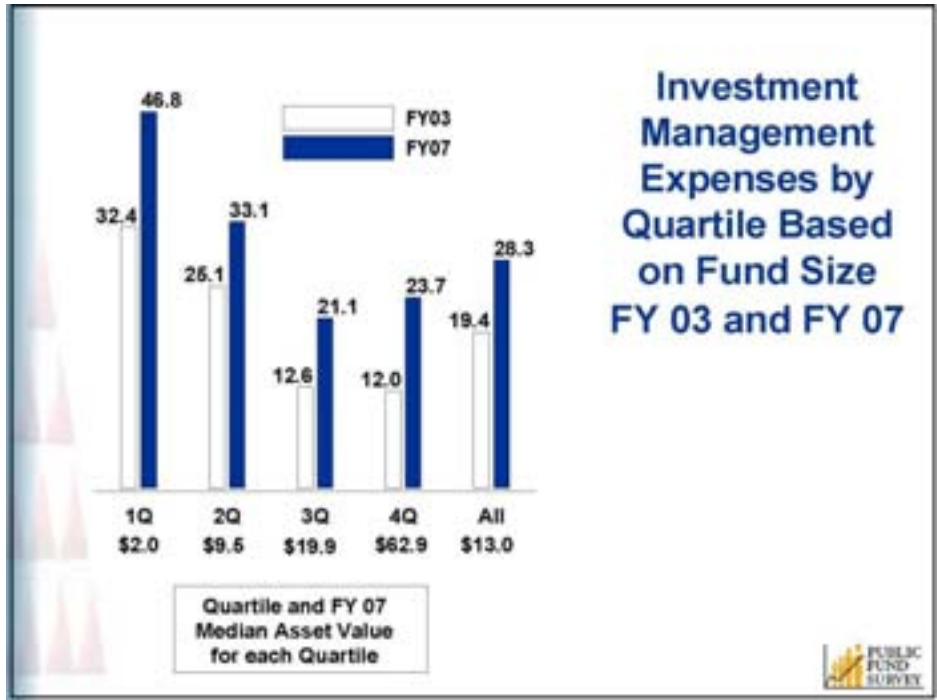
¹² The CRR data contains many data points, including administrative and investment cost details for 194 state and local retirement plans with a range of \$5 million to \$212 billion in assets and 63 to 1,490,172 active, inactive vested and retired participants. For the most part, it is based on 2006 information.

¹³ CRR obtains much of its data from NASRA, but supplements it with additional research on local public pension plans drawn from CAFRs and the U.S. Census Bureau’s public pension plan data series. Neither, it is worth noting, reflect the results of the 2008 market meltdown, which has not yet been incorporated in many public fund CAFRs.

slight difference in timing (the NASRA data is from 2007 while the CRR data is a year older). More importantly it would seem, the CRR quartiles reflect much lower average and median assets under management. It incorporates twice as many plans, most of which are smaller than any plans in the NASRA database. Note that the NASRA 2nd quartile has greater average and median assets than the CRR 3rd quartile and that the reported investment costs for the two are almost identical.

Still, the broad impact of scale on investment expense remains: the larger the plan, the lower its investment costs as a percentage of assets under management are likely to be.

The chart below also appears as *Attachment 4*. It was produced by NASRA as part of its published “Public Fund Survey” series and contains data for both Fiscal Years 2003 and 2007. Reporting *median* asset values and investment management expenses, it reflects a somewhat different methodology than that utilized in the charts from Attachment 2 reproduced earlier in this report, which calculates *average* values.¹⁴



¹⁴ By way of explanation, the numbers appearing above the columns represent “basis points,” or hundredths of a percent. So the 32.4 and 46.8 above the first pair of columns indicate investment management expenses of 0.324 percent and 0.468 percent. Also, the 1Q, 2Q, etc. below the pairs of columns represent quartiles, and the dollar amounts below (\$2.0, \$9.6, etc.) are the median assets of plans in each quartile.

Even with somewhat different methodologies, however, the 2007 data shows the same pattern of declining investment costs for the first three quartiles, with a slight rise in the fourth (and largest) quartile. The 2003 data, however, show a marginal decline in investment management expenses in the fourth quartile (from 0.126 percent to 0.120 percent).¹⁵

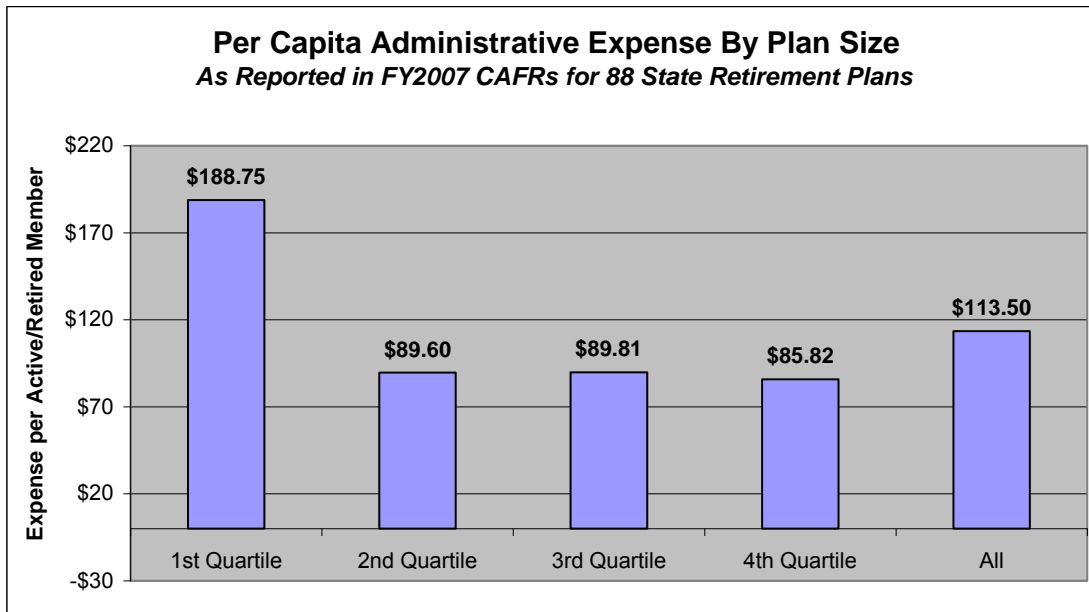
Key finding: *With respect to investment management costs, scale clearly matters, although the use of more expensive investment vehicles may slightly offset this effect for the largest plans. It is also possible that the very largest plans have reached the point of diminishing returns available from economies of scale.*

¹⁵ Intriguingly, reported 2003 investment management costs are about one-third lower than those reported for 2007. An exploration into the basis for this difference is beyond the scope of this report.

IV. Administrative Costs

The picture that emerges with respect to the relationship between scale and administrative costs is broadly similar to investment management expenses. However, there are indications that diminishing returns from economies of scale are reached earlier.

The chart below has been extracted from *Attachment 2*, and draws on the NASRA state pension plan data set. As will be immediately apparent, the reported per capita administrative costs are very similar for plans in the second through fourth quartiles. This would appear to indicate that economies of scale are not particularly important for plans above a certain size; in this case, the average and median membership for the second quartile hover around 84,000 active and retired participants. There is no indication from this data that plans above this size have lower per capita administrative costs.

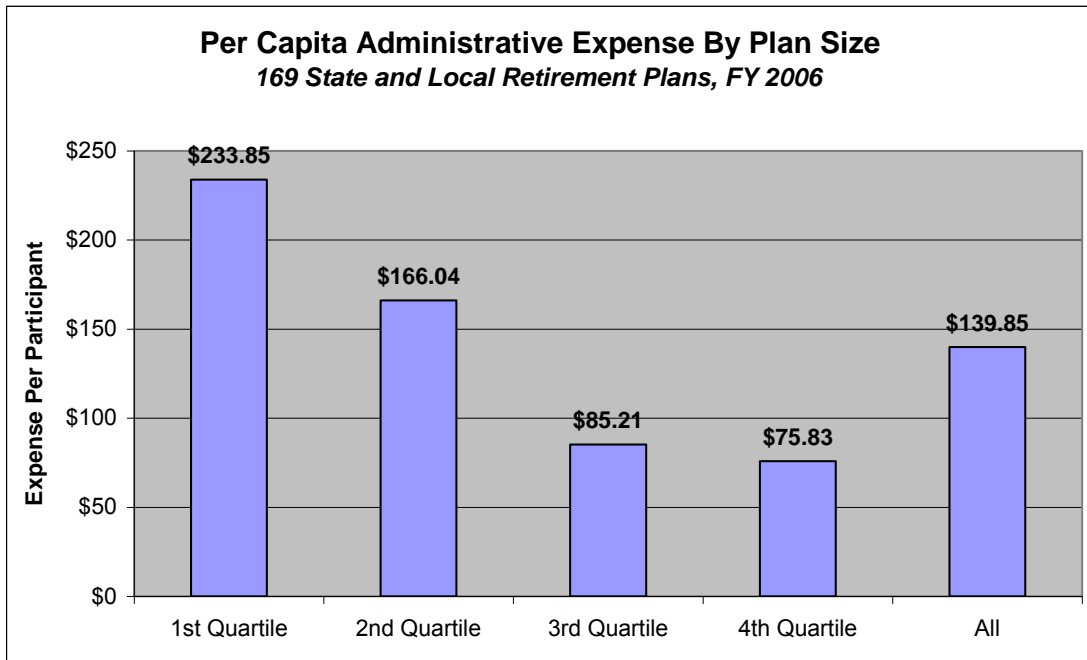


Members By Quartile	1st	2nd	3rd	4th	All
Average Members	24,538	83,838	186,539	537,029	207,986
Median Members	17,621	84,494	185,156	436,473	119,226
Funds	22	22	22	22	88

Source: National Association of State Retirement Administrators (NASRA)

The chart on the next page, drawn from the CRR data set, provides an interesting contrast with the NASRA-based per capita administrative expense analysis above. At first glance, it would appear that the CRR-based data yields a different result: for these plans, economies of scale appear to have a measurable, if declining, effect in all four quartiles. On closer examination, however, the results may not be materially different. The CRR data has twice as many plans but a much smaller average membership

size. It seems likely that the CRR-based chart is reflecting greater economies of for smaller plans versus very small plans, but not necessarily for the largest ones.¹⁶



Members / Quartile	1st	2nd	3rd	4th	All
Average Members	4,009	24,876	93,715	380,526	127,289
Median Members	4,158	19,048	86,220	269,253	56,149
Funds	42	42	42	43	169

Source: Boston College, Center for Retirement Research

Note again the similarities between the average and median membership counts for the NASRA data set’s second quartile and those for the CRR’s third quartile. It may well be that scale indeed matters, but only up to a point. We explore the question of scale and administrative expense through a specially commissioned analysis, below.

Special CEM Benchmarking, Inc. Analysis

During the course of this research, it became clear that the best single source for customized analyses regarding public employee pension fund financial dynamics comes from the Toronto-based CEM Benchmarking, Inc. In the words of one highly regarded pension consultant, CEM is the “gold standard” for public pension performance benchmarking; their tag line includes “what gets measured, gets managed.” CEM performs highly detailed analyses of pension fund investment and administrative practices, including those for fund returns and expenses, based on annual surveys of participating pension plans, which are asked to respond to provide some three hundred data points.

¹⁶ The CRR data includes active, inactive vested and retired members, while the NASRA data which was used for this report does not include inactive vested members.

As has been described above, there is at least some analysis available regarding the relationship of investment performance (returns and fees) and the size of funds' asset pools. However, other than the data obtained from NASRA and CRR, little systematic data is available on the relationship between membership size and administrative cost.

In addition, the NASRA and CRR data does not permit an analysis of the nature (or relative complexity) of the administrative functions being taken on by the public pension plans in their data sets. CEM, on the other hand, has the capacity to measure and analyze complexity as well absolute costs.

CEM was asked to perform the analysis of the effects of membership size on benefit administration (costs and level of service). The full CEM report is included as *Attachment 5*.

Key findings from the CEM analysis:

The CEM report drew upon detailed information from 44 U.S. and 45 non-U.S. funds, primarily using 2008 data (with 2007 or 2006 data where necessary).

Not surprisingly, CEM found that “costs fall as size increases.” Specifically, the benchmarking firm reports that the “exact nature of this relationship depends on the size of the systems involved.”

“However,” CEM notes, “*membership size is not a key driver of costs.*” Rather, other CEM research “indicates that the biggest driver of system costs is the *transaction volumes per member, or amount of work a system does.* Transaction volumes explain a large amount of the variation in total cost between systems of similar size and of different sizes” (*emphasis added*).

In other words, complexity—or what could perhaps be called “mission creep”—plays a major role in a fund's per capita administrative costs, regardless of the size of the system's membership.

As can be seen on page 7 of the CEM report, the firm performed a regression analysis to determine whether larger U.S. systems cost less per member than smaller ones. The answer, according to the firm's calculations, is that “as system size increases, there is a cost saving that is significant just below the 95% confidence level” (the t-statistic). For U.S. public pension funds,

“for every tenfold increase in the number of active and retired members, cost per member is expected to fall by \$36.60. In other words, if a system were to grow from 100,000 to 1,000,000 active and retired members, costs would be expected to fall by approximately \$37 per member.”

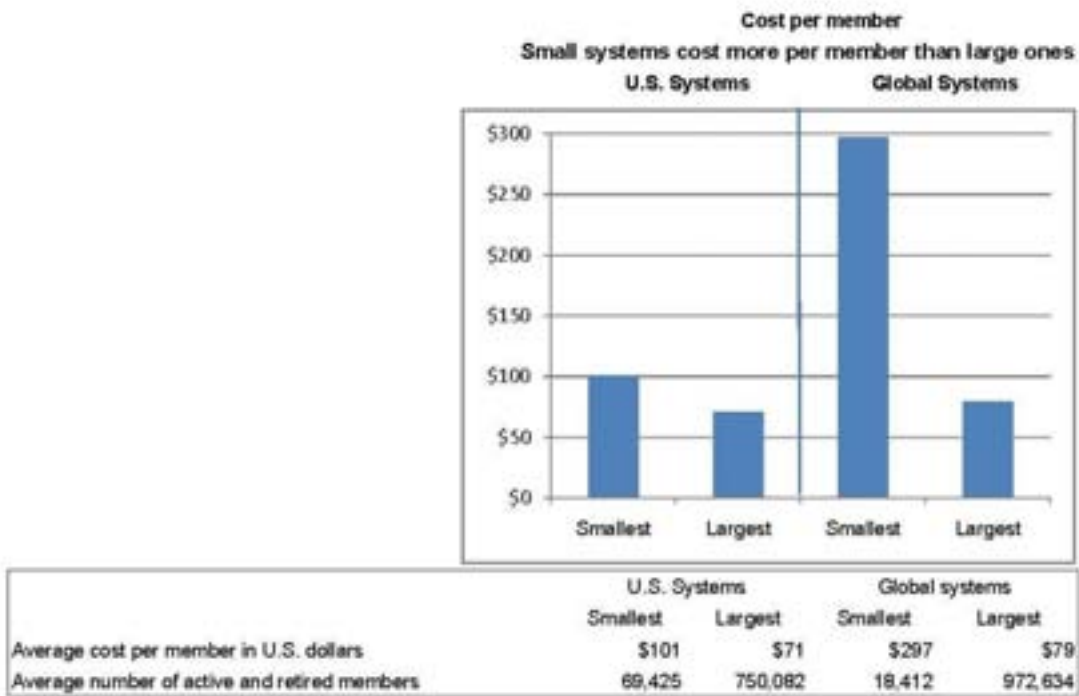
Still, the explanatory power of the impact of size on cost is fairly weak. This statistic in the regression, the “r-squared,” indicates that system size

“accounts for only 6% of the change in cost as systems grow. Additional research by CEM indicates that system size is not the biggest driver of costs: the key driver is transaction volumes per member, or the amount of work done by a system. There are large variations in costs between systems of the same size and these differences are largely due to different transaction volumes.”

CEM observes that it “is also likely that as fund size increases, so do diseconomies of scale due to the effects of excessive bureaucracy and organizational complexity. This could imply either or both of the following, neither of which we are able to confirm:

- Larger systems are less efficient due to overstaffing and excessive structure, and/or
- Larger systems are inherently more complex to administer, so that large IT investments, for example, become more expensive to handle that complexity.”

CEM provides a chart that reflects the results of a “simple comparison” of the costs of the ten largest U.S. and global systems with the ten smallest:

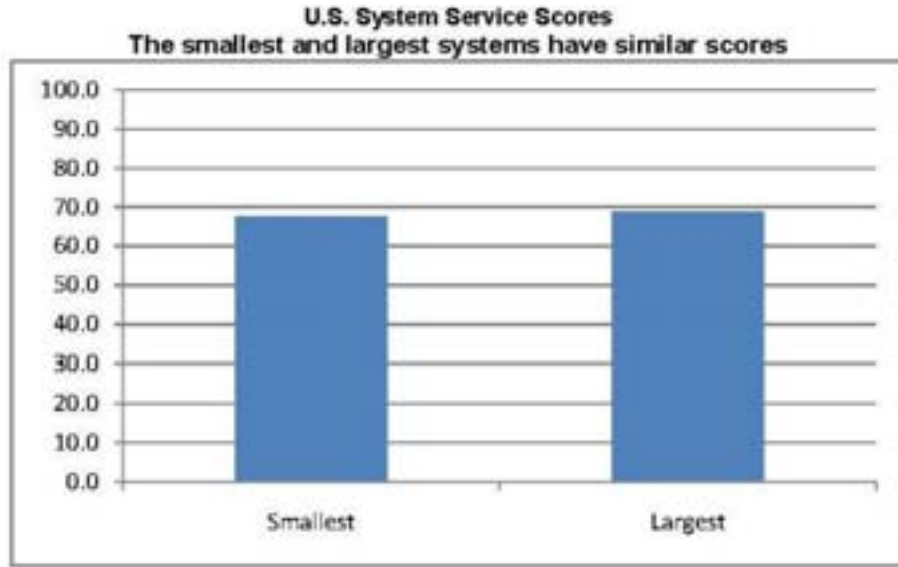


Turning to the question of whether membership size has an impact on the quality of services that a pension system provides its participants, CEM reports:

“There is no relationship between service levels and membership size. This likely reflects the fact that even the smallest U.S. systems in the CEM database are large and therefore all offer a full spectrum of services, ranging from member counseling to paying pensions.”

Specifically, CEM’s regression analysis reveals that pension “service scores do not increase with size: the zero coefficient generated by this analysis indicates that there is no correlation between system size and level of service.” The firm does note that the chart, below, reflecting the service scores of the ten largest with the ten smallest U.S. funds. “shows a small difference: the largest funds performed slightly better.”

Does Scale Matter for Public Sector Defined Benefit Plans?



	Smallest	Largest
Average service score for U.S. systems	67.5	68.7
Average number of active and retired members	69,425	750,082

Key finding: *With respect to administrative costs, scale would appear to matter most for smaller plans. Not only do economies of scale seem less available for larger plans, there may well be diseconomies as plans add functions and complexity to their operations (something which larger plans are in more of a position to do). In any case, the CEM analysis indicates that size as a factor in plans' administrative costs has a quite modest explanatory power.*

V. Governance Structure and Other Considerations

As mentioned at the beginning, this analysis was undertaken in the midst of growing calls for the consolidation of public pension plans. Advocacy of pension consolidation, however, is not limited to the U.S. nor to public pension plans alone.

In a recent speech, the head of the Ontario Municipal Employees Retirement System argued for aggressive actions to combine the many local public plans in the province, saying that the plans "cannot afford to deliver the quality and depth of governance, investment skills and risk management expertise their members need and deserve." He went further, though, endorsing an Ontario government proposal to permit the creation of "super funds" to manage and administer both public *and private* pension plans. The Ontario government proposal follows on recommendations from a commission of experts which argued that the benefits of consolidating smaller plans into larger ones would produce "lower investment fees, better in-house investment expertise, and the ability to spread investment risk through diversification."¹⁷

While there are often other factors at work, the allure of cost-savings through consolidation is usually the driving consideration underlying most such proposals. As we have seen, economies of scale may well be available, but anticipated savings need to be carefully evaluated. Moreover, there are often other considerations that must be taken into account.

For example, perhaps the most intense debate over pension consolidation in the U.S. has been playing out in Illinois, where the state treasurer has proposed combining investment authority over the assets of five state retirement systems. While there is some dispute over the likely savings that would be achieved, the Illinois Education Association raised several other important issues in its opposition to the treasurer's proposal:

- High potential transition costs,
- Lack of diversity of multiple investment pools, and
- Dilution of participant representation on the Board of Trustees¹⁸

Combining the assets of several large retirement systems is not a simple matter, IEA argues. It cites an estimate by a major investment consultant that the transition costs associated with the proposed consolidation would be in the \$226 million to \$370 million range (for assets valued at around \$60-\$70 billion).¹⁹

The concern about the loss of investment pool diversity reflects an underappreciated issue in the retirement plan consolidation debate: the demographic profile of groups of public employees will vary. For example, crafting an investment portfolio to reflect the specific characteristics of a participant

¹⁷ <http://pensionpulse.blogspot.com/2009/04/pension-consolidation.html>.

¹⁸ These are the most relevant points of contention, although there others. See www.ieanea.org/local/IEA-RetiredSouthwesternChapter/assets/pension%20fund%20consolidation%20fact%20sheet.pdf

¹⁹ Also, in a presentation published by the CFA Institute, the Frank Russell Company's Robert Werner argues that only "20% of all transaction costs are visible; they include commissions, taxes and fees, and custodial charges. The other 80% are invisible, or hidden – the bid/ask spread, incremental market impact, and opportunity costs." <http://www.cfapubs.org/doi/pdf/10.2469/cp.v2001.n2.3079>

population will require taking into account likely retirement behavior and timing, which in turn should inform the structure of the plan's portfolio (time horizons, cash flow, etc.).

Commenting on the proposed consolidation of the Illinois plans, a past vice president of pensions for the American Academy of Actuaries, Ken Kent, argued that consolidating state systems is more complicated than simply cutting costs. "The experience depends on the nature of the group—the employment behavior of a general employee versus a teacher can be different in terms of turnover, retirement structure, and benefit structure," he said. "Separate systems can focus more on their particular group."²⁰

The IEA concern over dilution of participant representation on a combined retirement system is obviously one that is widely shared among employee organizations across the country.²¹ Moreover, while they clearly offer potential benefits in the form of lower costs and broader services, larger systems—particularly those encompassing multiple plans and participant groups—risk becoming less responsive to the needs of participants than smaller systems that are responsible for a single participant group; moreover, the ability of retirement systems to provide acceptable levels of service to participants appears to be unrelated to size.

Key finding: *The potential benefits of prospective retirement system consolidation should be carefully evaluated in the light of transition costs, integration risks, and the impact, if any, on participant involvement in fund governance. The possibility that consolidation could result in a decrease in responsiveness to participant needs should also be scrutinized.*

²⁰ <http://www.gazettechicago.com/index/?p=178>

²¹ For more background on the Illinois pension consolidation issue, see <http://trs.illinois.gov/subsections/press/2008/Dec1.pdf> , <http://www.ieanea.org/page8903350.aspx>, <http://www.ieanea.org/page8904546.aspx>,

VI. Postscript: How Big is Big Enough?

As this analysis has found, from earnings, to investment costs and administrative expenses, the benefits of scale are apparent, but complex. Not only is it unclear where the economies of scale begin to wane, there are indications that at some point, *diseconomies* begin to kick in. Obviously, the potential negative effects of scale—perhaps better described as externalities stemming from increased complexity—they may well not be sufficiently detrimental to obviate many other benefits of consolidation. In any case, they should be thoroughly understood and carefully evaluated.

While many pension experts argue that public retirement plans should consolidate in order to take advantage of scale, few have actually attempted to determine where, or if, these benefits reach a point of diminishing returns. Several years ago, however, two academic researchers attempted to identify that point with a startling level of precision:

“It was determined that scale economies ended at 518,392 for active members and 342,369 for beneficiary members. These values represented the optimal scale for the number of active members and beneficiary members and the minimum point of the average cost curve. Therefore, while administrative cost savings occur when adding members up to these active and beneficiary sizes, administrative cost savings do not occur beyond these membership sizes.”²²

Given the evidence previously cited in this analysis, these numbers seem high. For example, the administrative expense data which we report indicates that plans with around 90,000 active and retired members may have already attained most or all of the savings available to them.

Interestingly, one of the leading proponents of “High Performance Pension Delivery Organizations,” (including pension consolidation), has ventured an estimate that is broadly consistent with the data developed in this analysis. Writing in a paper available on NASRA’s web site, Keith Ambachtsheer lists four “key attributes” that he argues must be present for pension plans to achieve optimal effectiveness. One of those attributes is “Sufficient Scale: pension investing and administration are both highly scalable activities. Bigger is better.”

Ambachtsheer speculates that a “rule of thumb” would be that the “minimum required scale markers” are in the range of \$10 billion in assets and/or 50,000 plan members.²³

²² “Are Bigger State and Local Public Pension Plans More Cost Efficient? An Analysis of Economies of Scale,” James H. Dulebohn, Hsiu-Lang Chen, *Review of Accounting and Finance*, 2003 Vol. 2 Issue 3, p. 38

²³ “The Three Grades of Pension Fund Governance Quality: Bad, Better, and Best,” Keith Ambachtsheer, July 4, 2007. Obtained at www.nasra.org/resources/Ambachtsheer%2007.pdf In addition to Sufficient Scale, Ambachtsheer’s three other key attributes for a High Performance PDO include: Arms-Length Legal Structure, Professional Board Structure (while acknowledging that the representative dimension of boards “cannot be ignored”), and “High Performance” Culture. Ambachtsheer is a founder of CEM Benchmarking, Inc., but no longer plays a day-to-day role in the firm.

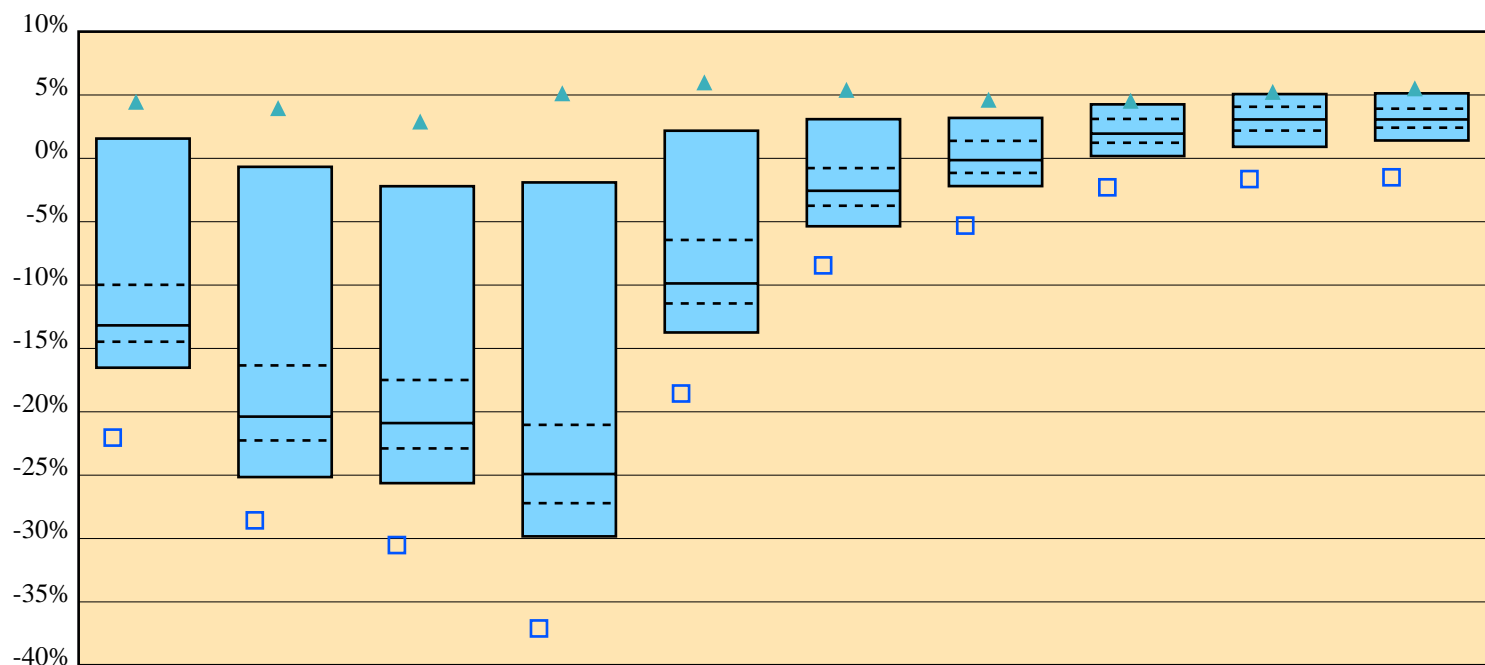
Attachments

Trust Universe Comparision Service
Public Fund Performance Analysis
December 31, 2008

Trust Universe Comparison Service

Total Returns of Public Funds

Rates of Return for Periods Ending December 31, 2008

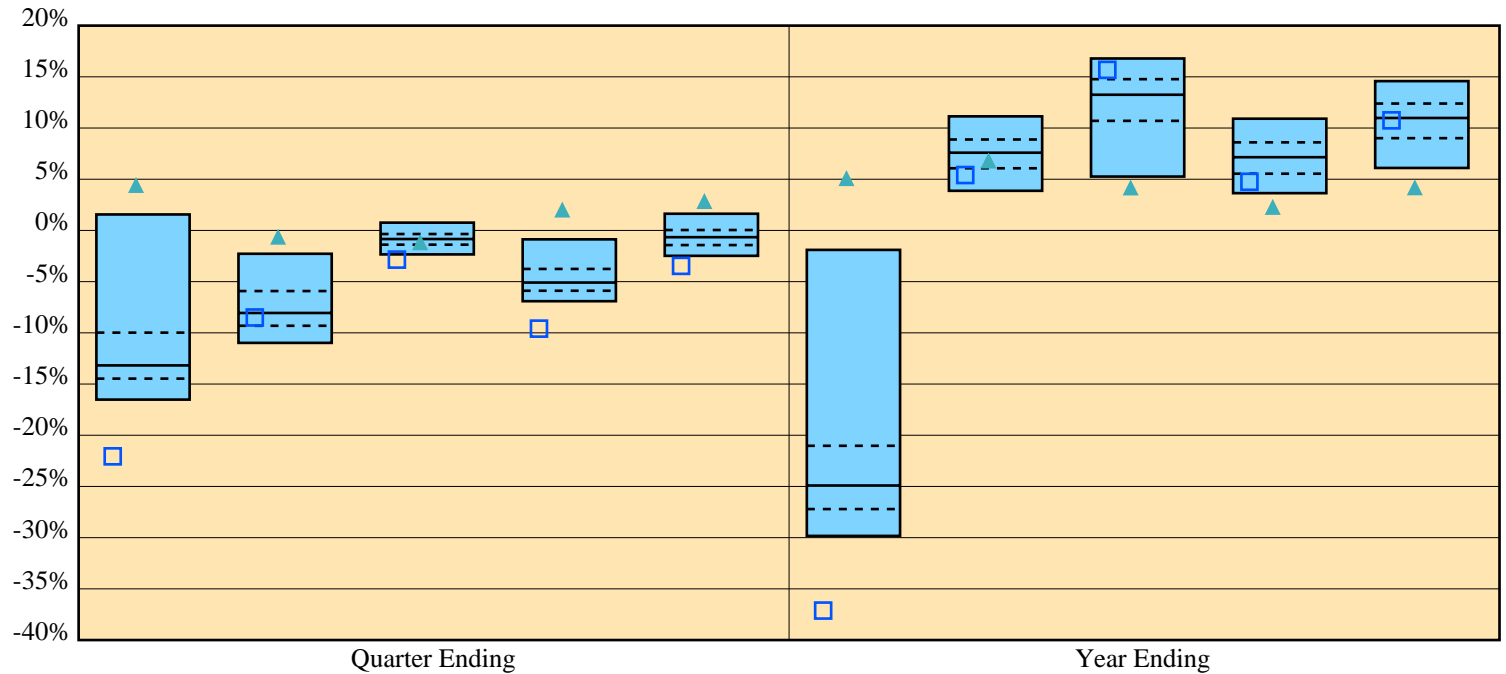


	<u>1 Quarter</u>	<u>2 Quarters</u>	<u>3 Quarters</u>	<u>1 Year</u>	<u>2 Years</u>	<u>3 Years</u>	<u>4 Years</u>	<u>5 Years</u>	<u>7 Years</u>	<u>10 Years</u>
5th Percentile	1.56	-0.67	-2.20	-1.90	2.18	3.09	3.19	4.26	5.07	5.13
25th Percentile	-9.98	-16.34	-17.49	-21.03	-6.44	-0.77	1.38	3.11	4.07	3.92
Median	-13.18	-20.38	-20.89	-24.91	-9.87	-2.56	-0.14	1.95	3.07	3.07
75th Percentile	-14.47	-22.26	-22.89	-27.21	-11.45	-3.74	-1.15	1.23	2.19	2.42
95th Percentile	-16.52	-25.15	-25.63	-29.83	-13.74	-5.36	-2.19	0.18	0.91	1.41
□ S&P 500	-21.93 (99)	-28.46 (99)	-30.41 (99)	-36.99 (99)	-18.45 (99)	-8.34 (99)	-5.20 (100)	-2.18 (100)	-1.53 (100)	-1.39 (100)
▲ Barclays Aggregate	4.57 (1)	4.07 (1)	3.01 (1)	5.24 (1)	6.10 (1)	5.51 (1)	4.73 (3)	4.65 (3)	5.35 (4)	5.63 (2)

Trust Universe Comparison Service

Total Returns of Public Funds

Recent Periods

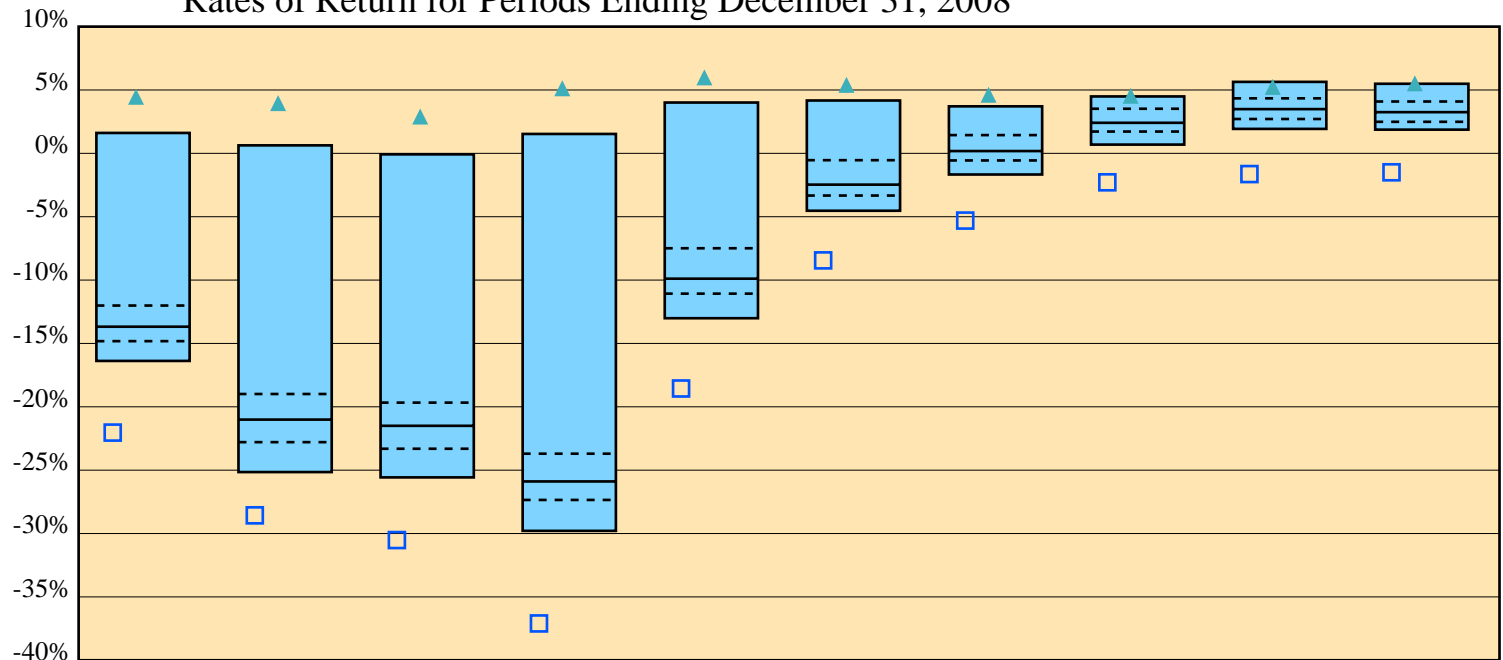


	Dec 08	Sep 08	Jun 08	Mar 08	Dec 07	Dec 08	Dec 07	Dec 06	Dec 05	Dec 04
5th Percentile	1.56	-2.28	0.76	-0.87	1.63	-1.90	11.14	16.79	10.91	14.58
25th Percentile	-9.98	-5.92	-0.35	-3.76	0.04	-21.03	8.88	14.77	8.60	12.39
Median	-13.18	-8.06	-0.84	-5.09	-0.66	-24.91	7.59	13.25	7.15	10.98
75th Percentile	-14.47	-9.31	-1.39	-5.89	-1.43	-27.21	6.07	10.70	5.54	9.01
95th Percentile	-16.52	-10.98	-2.34	-6.91	-2.48	-29.83	3.87	5.26	3.64	6.10
□ S&P 500	-21.93 (99)	-8.37 (54)	-2.72 (98)	-9.46 (99)	-3.33 (99)	-36.99 (99)	5.54 (82)	15.81 (8)	4.88 (86)	10.88 (52)
▲ Barclays Aggregate	4.57 (1)	-0.48 (2)	-1.02 (60)	2.17 (1)	3.00 (1)	5.24 (1)	6.96 (57)	4.33 (97)	2.43 (98)	4.34 (98)

Trust Universe Comparison Service Total Returns of Public Funds

Total Market Value Greater Than \$1.0 Billion

Rates of Return for Periods Ending December 31, 2008



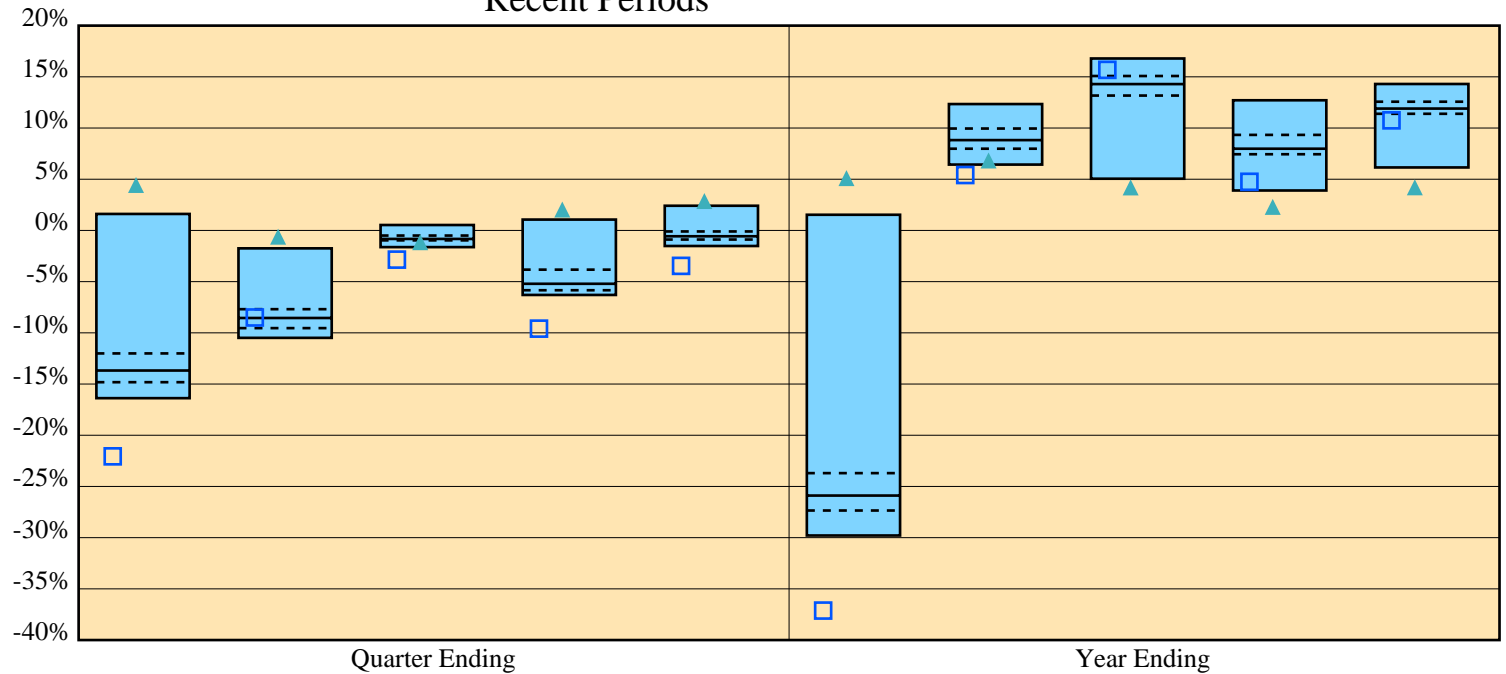
	<u>1 Quarter</u>	<u>2 Quarters</u>	<u>3 Quarters</u>	<u>1 Year</u>	<u>2 Years</u>	<u>3 Years</u>	<u>4 Years</u>	<u>5 Years</u>	<u>7 Years</u>	<u>10 Years</u>
5th Percentile	1.61	0.63	-0.08	1.53	4.01	4.17	3.71	4.49	5.64	5.49
25th Percentile	-12.01	-18.99	-19.67	-23.70	-7.49	-0.54	1.44	3.52	4.34	4.09
Median	-13.68	-21.01	-21.50	-25.89	-9.89	-2.47	0.18	2.41	3.49	3.25
75th Percentile	-14.82	-22.79	-23.31	-27.35	-11.07	-3.33	-0.56	1.72	2.71	2.49
95th Percentile	-16.38	-25.15	-25.57	-29.79	-13.01	-4.53	-1.67	0.69	1.93	1.87
□ S&P 500	-21.93 (100)	-28.46 (100)	-30.41 (100)	-36.99 (100)	-18.45 (100)	-8.34 (100)	-5.20 (100)	-2.18 (100)	-1.53 (100)	-1.39 (100)
▲ Barclays Aggregate	4.57 (1)	4.07 (1)	3.01 (1)	5.24 (1)	6.10 (1)	5.51 (1)	4.73 (2)	4.65 (2)	5.35 (5)	5.63 (1)

Trust Universe Comparison Service

Total Returns of Public Funds

Total Market Value Greater Than \$1.0 Billion

Recent Periods



5th Percentile
 25th Percentile
 Median
 75th Percentile
 95th Percentile

	Dec 08	Sep 08	Jun 08	Mar 08	Dec 07	Dec 08	Dec 07	Dec 06	Dec 05	Dec 04
5th Percentile	1.61	-1.75	0.53	1.06	2.41	1.53	12.34	16.79	12.71	14.30
25th Percentile	-12.01	-7.69	-0.50	-3.83	-0.10	-23.70	9.95	15.08	9.33	12.57
Median	-13.68	-8.55	-0.83	-5.21	-0.57	-25.89	8.82	14.29	7.98	11.90
75th Percentile	-14.82	-9.54	-0.97	-5.84	-0.89	-27.35	7.98	13.17	7.44	11.39
95th Percentile	-16.38	-10.49	-1.63	-6.30	-1.52	-29.79	6.43	5.05	3.90	6.15

□ S&P 500
 ▲ Barclays Aggregate

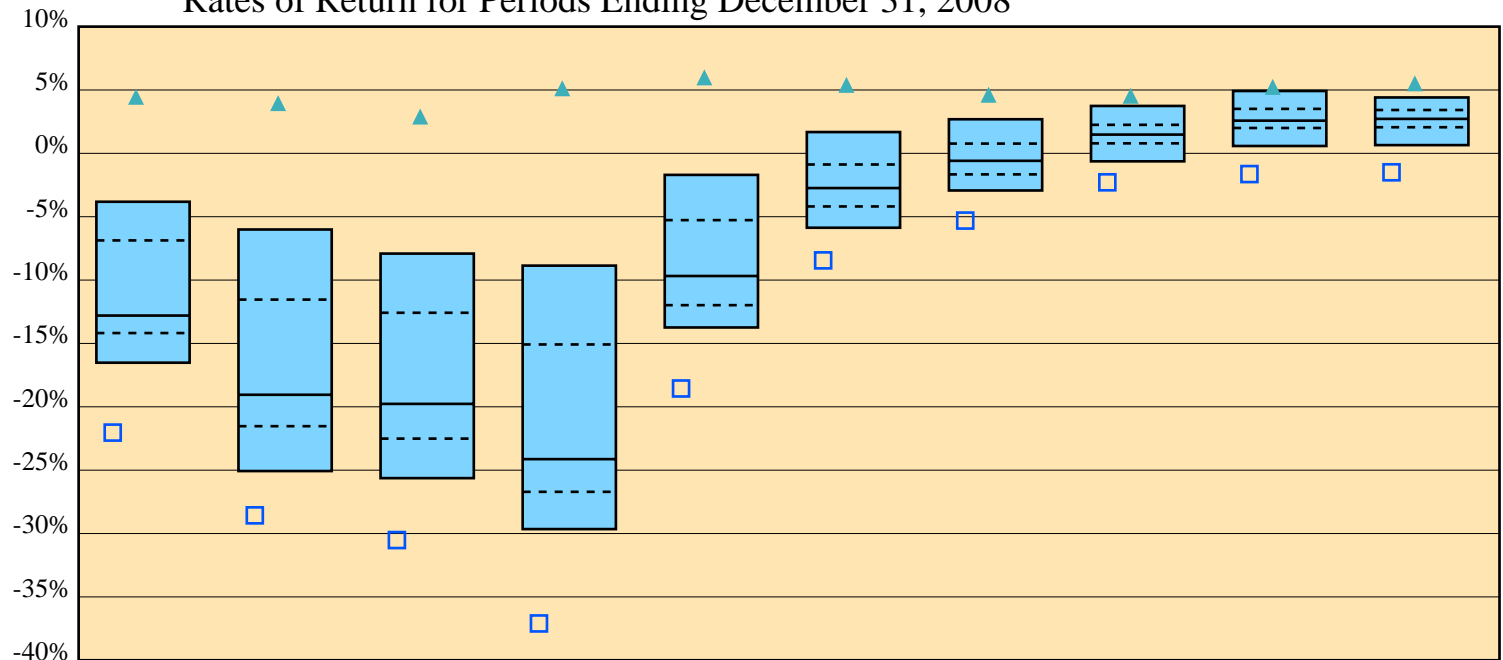
S&P 500	-21.93 (100)	-8.37 (41)	-2.72 (100)	-9.46 (100)	-3.33 (100)	-36.99 (100)	5.54 (99)	15.81 (12)	4.88 (89)	10.88 (80)
Barclays Aggregate	4.57 (1)	-0.48 (2)	-1.02 (76)	2.17 (1)	3.00 (1)	5.24 (1)	6.96 (84)	4.33 (100)	2.43 (99)	4.34 (97)

Trust Universe Comparison Service

Total Returns of Public Funds

Total Market Value Less Than \$1.0 Billion

Rates of Return for Periods Ending December 31, 2008



	1 Quarter	2 Quarters	3 Quarters	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th Percentile	-3.82	-6.01	-7.91	-8.86	-1.70	1.68	2.69	3.74	4.92	4.41
25th Percentile	-6.87	-11.54	-12.58	-15.08	-5.27	-0.88	0.77	2.25	3.51	3.42
Median	-12.80	-19.05	-19.77	-24.13	-9.68	-2.74	-0.59	1.48	2.58	2.72
75th Percentile	-14.18	-21.53	-22.51	-26.71	-11.98	-4.19	-1.66	0.79	2.00	2.06
95th Percentile	-16.52	-25.07	-25.63	-29.65	-13.74	-5.87	-2.93	-0.63	0.58	0.65

□ S&P 500
▲ Barclays Aggregate

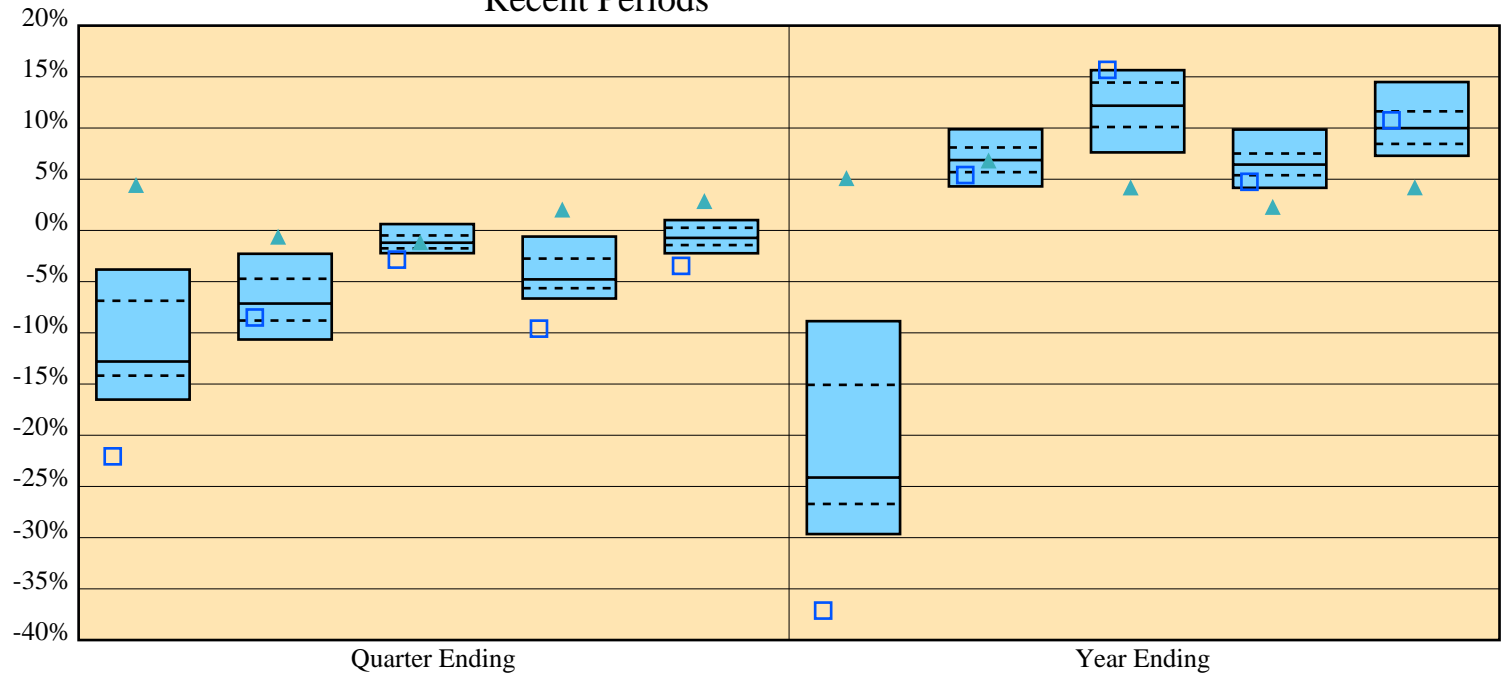
-21.93 (99)	-28.46 (99)	-30.41 (99)	-36.99 (99)	-18.45 (99)	-8.34 (99)	-5.20 (100)	-2.18 (100)	-1.53 (100)	-1.39 (100)
4.57 (1)	4.07 (1)	3.01 (1)	5.24 (1)	6.10 (1)	5.51 (1)	4.73 (1)	4.65 (1)	5.35 (1)	5.63 (1)

Trust Universe Comparison Service

Total Returns of Public Funds

Total Market Value Less Than \$1.0 Billion

Recent Periods



5th Percentile
25th Percentile
Median
75th Percentile
95th Percentile

	Dec 08	Sep 08	Jun 08	Mar 08	Dec 07	Dec 08	Dec 07	Dec 06	Dec 05	Dec 04
5th Percentile	-3.82	-2.28	0.62	-0.60	1.01	-8.86	9.88	15.65	9.85	14.49
25th Percentile	-6.87	-4.72	-0.49	-2.75	0.26	-15.08	8.10	14.44	7.51	11.63
Median	-12.80	-7.14	-1.20	-4.78	-0.73	-24.13	6.87	12.18	6.43	9.99
75th Percentile	-14.18	-8.80	-1.75	-5.64	-1.43	-26.71	5.69	10.10	5.39	8.45
95th Percentile	-16.52	-10.65	-2.22	-6.65	-2.23	-29.65	4.30	7.62	4.16	7.29

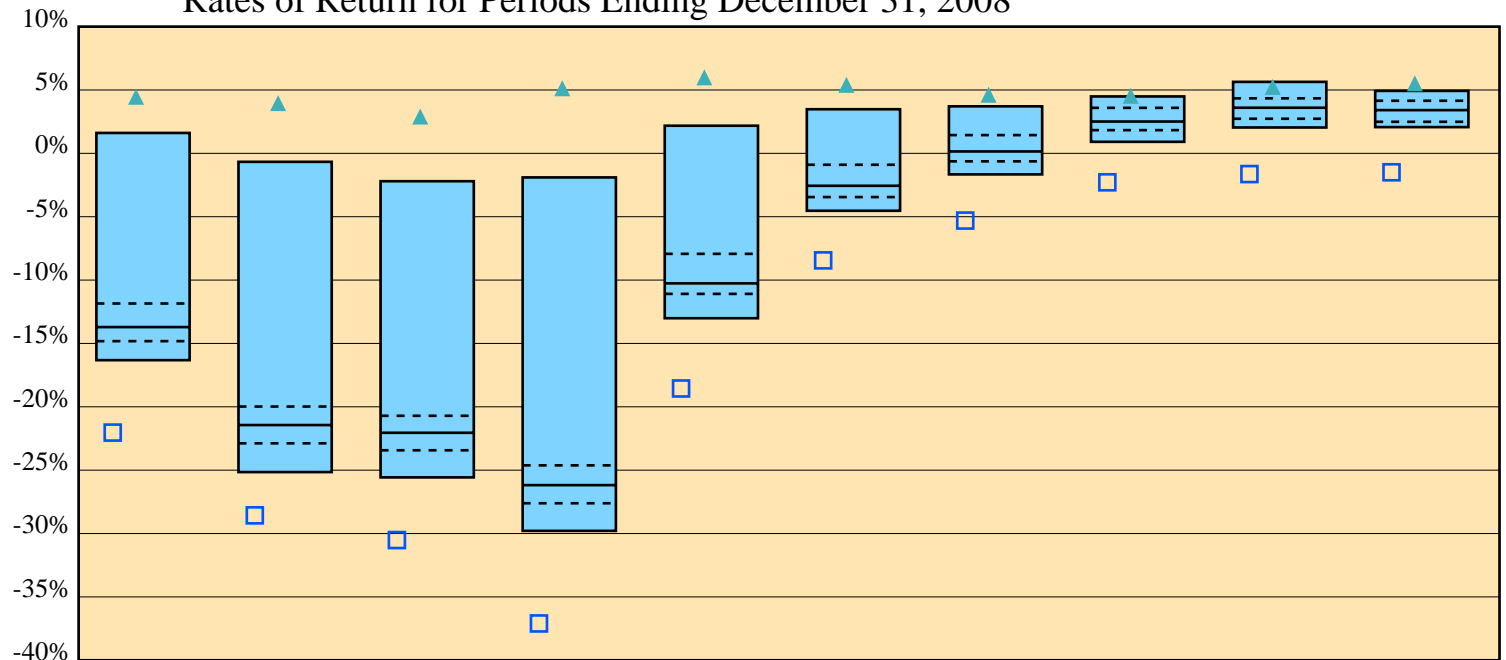
□ S&P 500
▲ Barclays Aggregate

S&P 500	-21.93 (99)	-8.37 (66)	-2.72 (99)	-9.46 (99)	-3.33 (100)	-36.99 (99)	5.54 (81)	15.81 (2)	4.88 (87)	10.88 (36)
Barclays Aggregate	4.57 (1)	-0.48 (1)	-1.02 (40)	2.17 (1)	3.00 (1)	5.24 (1)	6.96 (46)	4.33 (97)	2.43 (100)	4.34 (100)

Trust Universe Comparison Service Total Returns of Public Funds

Total Market Value Greater Than \$5.0 Billion

Rates of Return for Periods Ending December 31, 2008



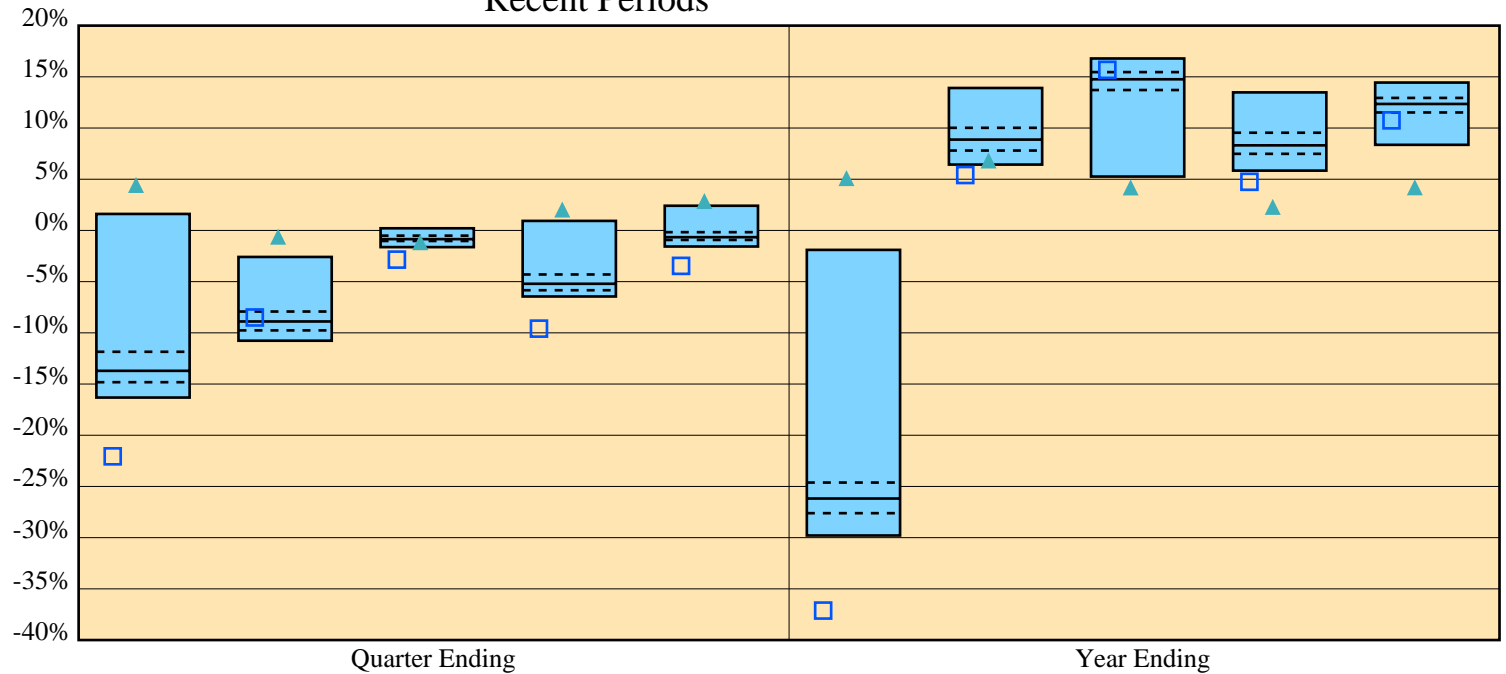
	<u>1 Quarter</u>	<u>2 Quarters</u>	<u>3 Quarters</u>	<u>1 Year</u>	<u>2 Years</u>	<u>3 Years</u>	<u>4 Years</u>	<u>5 Years</u>	<u>7 Years</u>	<u>10 Years</u>
5th Percentile	1.61	-0.67	-2.20	-1.90	2.18	3.48	3.71	4.49	5.64	4.93
25th Percentile	-11.85	-19.98	-20.71	-24.62	-7.93	-0.90	1.44	3.59	4.34	4.15
Median	-13.71	-21.44	-22.05	-26.18	-10.26	-2.56	0.15	2.51	3.60	3.41
75th Percentile	-14.82	-22.88	-23.43	-27.61	-11.09	-3.45	-0.63	1.83	2.73	2.49
95th Percentile	-16.32	-25.15	-25.57	-29.79	-13.01	-4.53	-1.66	0.91	2.04	2.07
□ S&P 500	-21.93 (100)	-28.46 (100)	-30.41 (100)	-36.99 (100)	-18.45 (100)	-8.34 (100)	-5.20 (100)	-2.18 (100)	-1.53 (100)	-1.39 (100)
▲ Barclays Aggregate	4.57 (1)	4.07 (1)	3.01 (1)	5.24 (1)	6.10 (1)	5.51 (1)	4.73 (1)	4.65 (1)	5.35 (5)	5.63 (1)

Trust Universe Comparison Service

Total Returns of Public Funds

Total Market Value Greater Than \$5.0 Billion

Recent Periods



5th Percentile
 25th Percentile
 Median
 75th Percentile
 95th Percentile

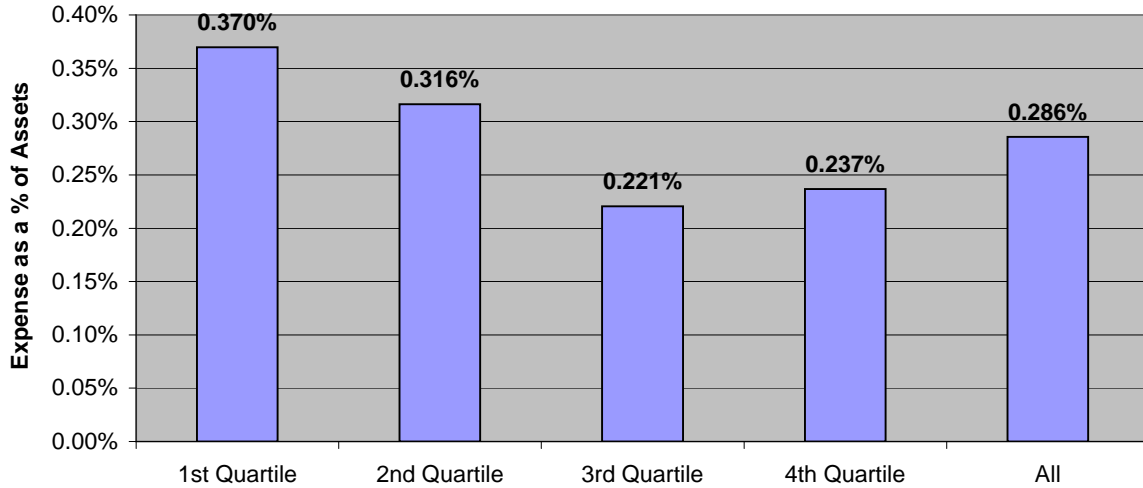
	Dec 08	Sep 08	Jun 08	Mar 08	Dec 07	Dec 08	Dec 07	Dec 06	Dec 05	Dec 04
5th Percentile	1.61	-2.59	0.21	0.93	2.41	-1.90	13.91	16.79	13.48	14.44
25th Percentile	-11.85	-7.92	-0.51	-4.30	-0.17	-24.62	10.02	15.46	9.54	12.94
Median	-13.71	-8.89	-0.85	-5.21	-0.66	-26.18	8.87	14.76	8.31	12.35
75th Percentile	-14.82	-9.76	-1.03	-5.84	-0.93	-27.61	7.80	13.71	7.48	11.52
95th Percentile	-16.32	-10.77	-1.63	-6.45	-1.57	-29.79	6.43	5.26	5.84	8.36

□ S&P 500
 ▲ Barclays Aggregate

	-21.93 (100)	-8.37 (35)	-2.72 (100)	-9.46 (100)	-3.33 (100)	-36.99 (100)	5.54 (100)	15.81 (14)	4.88 (96)	10.88 (91)
	4.57 (1)	-0.48 (1)	-1.02 (72)	2.17 (1)	3.00 (1)	5.24 (1)	6.96 (83)	4.33 (100)	2.43 (100)	4.34 (100)

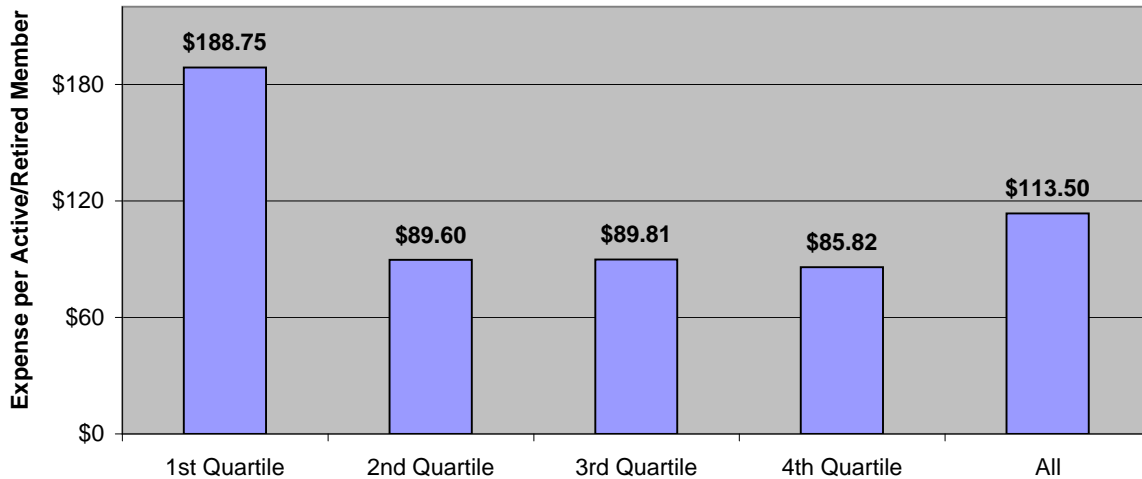
Relationship Between Scale and Expense: State Retirement Plans

Investment Expense by Plan Assets Under Management
For 88 State Retirement Plans, FY2007



	Quartile (Smallest to Largest)				
	1st	2nd	3rd	4th	All
Average Assets (\$Bn)	\$3.3	\$10.1	\$21.6	\$83.2	\$29.6
Median Assets (\$Bn)	\$3.0	\$10.3	\$20.4	\$65.1	\$13.7
Plans	22	22	22	22	88

Per Capita Administrative Expense By Plan Membership
For 88 State Retirement Plans, FY 2007

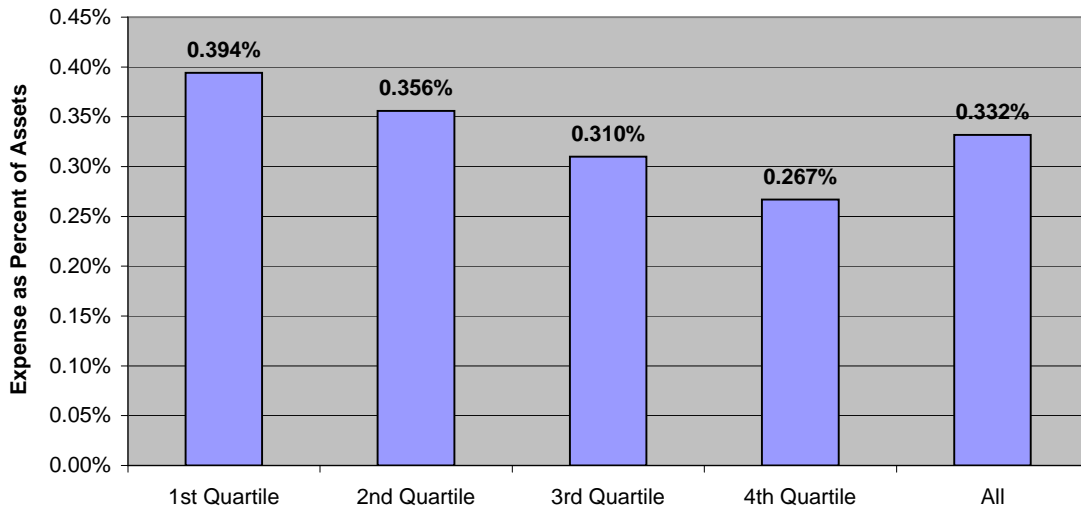


	Quartile (Smallest to Largest)				
	1st	2nd	3rd	4th	All
Average Members	24,538	83,838	186,539	537,029	207,986
Median Members	17,621	84,494	185,156	436,473	119,226
Plans	22	22	22	22	88

NB: "Members" includes active and retired participants and beneficiaries but excludes inactives
 Source: National Association of State Retirement Administrators (NASRA); FY 2007 data

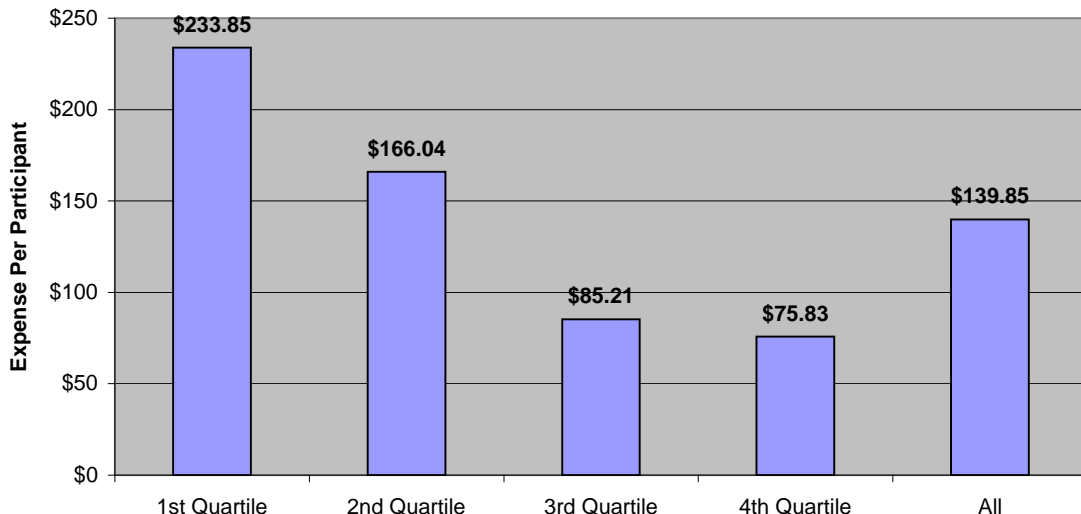
Relationship Between Scale and Expense: State and Local Retirement Plans

Investment Expense by Plan Assets Under Management
For 184 State and Local Retirement Plans, FY 2006



	Quartile (Smallest to Largest)				
	1st	2nd	3rd	4th	All
Average Assets (\$Bn)	\$0.4	\$2.7	\$9.0	\$42.8	\$13.7
Median Assets (\$Bn)	\$0.4	\$2.3	\$8.3	\$24.6	\$5.1
Plans	46	46	46	46	184

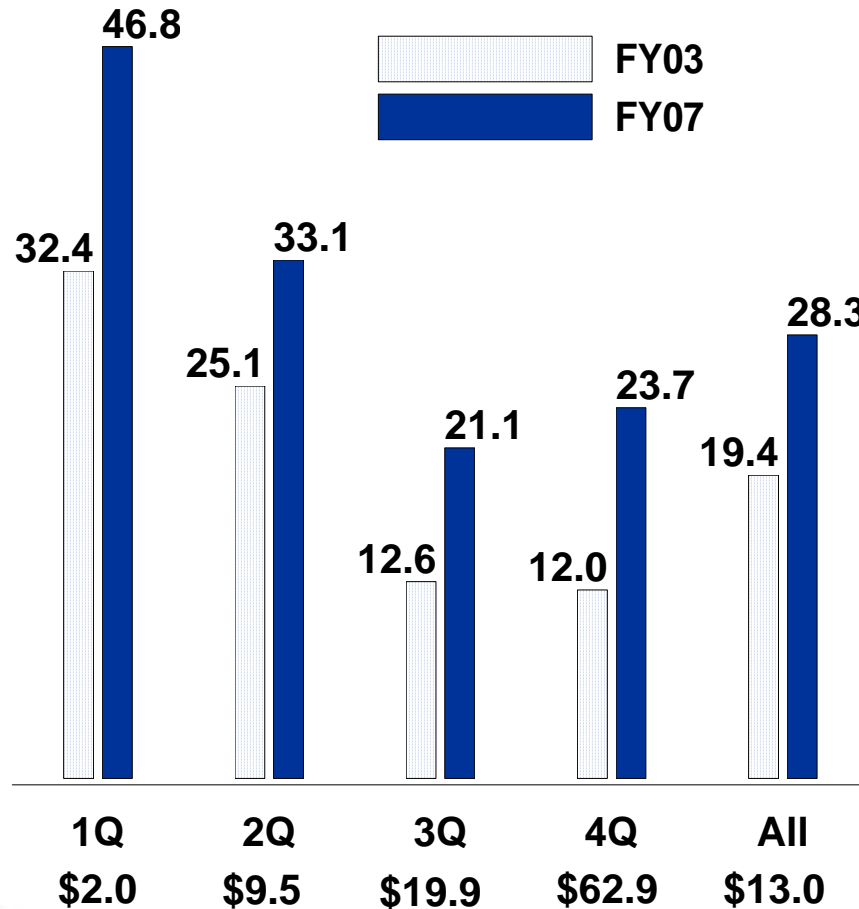
Per Capita Administrative Expense By Plan Membership
169 State and Local Retirement Plans, FY 2006



	Quartile (Smallest to Largest)				
	1st	2nd	3rd	4th	All
Average Members	4,009	24,876	93,715	380,526	127,289
Median Members	4,158	19,048	86,220	269,253	56,149
Plans	42	42	42	43	169

NB: "Members" includes active, inactive, and retired participants and beneficiaries.
Source: Center for Retirement Research (CRR), Boston College; FY 2006 data

Investment Management Expenses by Quartile Based on Fund Size FY 03 and FY 07



Quartile and FY 07 Median Asset Value for each Quartile



**U.S. Defined Benefit Funds
Pension Administration Analysis**

Report on the Effects of Membership Size

March 20, 2009

**for the
Center for Economic Organizing**

Prepared March 20, 2009 by:

CEM Benchmarking Inc.
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A. BACKGROUND

Background

- This study was commissioned by Randy Barber of the Center for Economic Organizing. There are two objectives:
 1. To understand how the per member costs of pension administration of U.S. defined benefit pension systems change with the size of membership.
 2. To understand how services offered vary by system size and the possible impact on per member costs.
- The analysis is based on CEM Benchmarking Inc.'s (CEM) 10-year database of pension administration service levels, transaction volumes and costs. CEM is a Toronto-based global benchmarking firm that benchmarks both investment and pension administration performance. Founded in 1992, CEM serves 408 pension fund clients, including 50 of the world's 100 largest funds.
- CEM collects this data through an annual survey of its clients and subsequently scrubs the data to ensure accuracy and consistent reporting. By using the CEM database for this review, you are ensuring standardization of data, which is not available by reading systems' financial statements. You can be assured that you are receiving an apples-to-apples comparison in this analysis.
- For this report, the CEM database is used to perform some regressions and to compare results of large and small funds to answer the questions listed above. As a caveat, regression analysis measures the correlations of factors (e.g., whether costs change with size), but is not an indication of causality. In other words, this analysis can tell you whether and by how much your costs decrease with system size, but does not indicate why.
- Data is collected from 44 U.S. and 45 non-U.S. defined benefit systems. Where 2008 data is not available, in order to ensure a large sample size, data from 2007 or 2006 is used, whichever is freshest.

B. FINDINGS

1. Costs fall as size increases. The exact nature of this relationship depends on the size of the systems involved. The average U.S. pension system saves approximately \$37 per member for every tenfold increase in membership size. For example, if a system grows from 100,000 to 1,000,000 active and retired members, its costs would be expected to fall by \$37 per member.

However, membership size is not a key driver of costs. Other CEM research indicates that the biggest driver of system costs is the transaction volumes per member, or amount of work a system does. Transaction volumes explain a large amount of the variation in total cost between systems of similar size and of different sizes.

In a direct comparison of the smallest versus the largest U.S. pension systems, the smallest U.S. systems in the CEM database cost approximately \$30 per member more than the largest. Globally, the difference is much larger, most likely because of the higher number of small systems in the CEM global database.

For very small systems, the savings from economies of scale are expected to be much higher. This is evident in the results from the global analysis (U.S. and non-U.S. systems together), which includes much smaller systems. The economies of scale rise to \$108 per member for a tenfold increase in size.

2. There is no relationship between service levels and membership size. This likely reflects the fact that even the smallest U.S. systems in the CEM database are large and therefore all offer a full spectrum of services, ranging from member counseling to paying pensions.

C. DATABASE CHARACTERISTICS

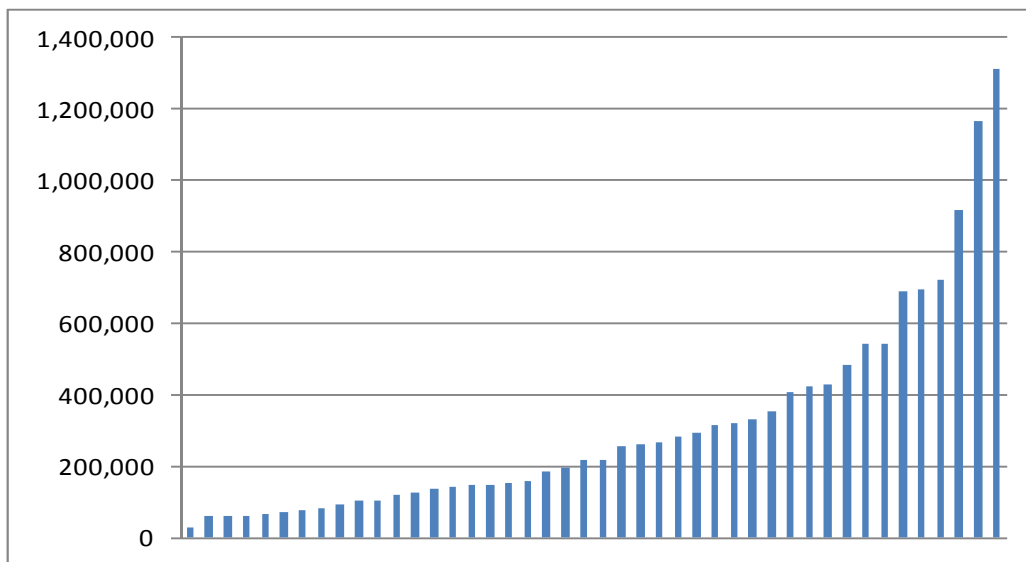
System size (total active and retired members)

U.S. systems

The 44 systems included in CEM's database are the following.

Arizona SRS	Iowa PERS	New Mexico ERB	South Carolina RS
CalPERS	KPERS	North Carolina RS	South Dakota RS
CalSTRS	LACERA	NYC TRS	STRS Ohio
Colorado PERA	Maryland	NYSLRS	Texas County & District RS
Connecticut Teachers	Michigan MERS	Ohio PERS	Texas MRS
Delaware PERS	Michigan ORS	Ohio SERS	TRS Louisiana
ERS of Rhode Island	Minnesota Teachers	Oklahoma PERS	TRS of Texas
Idaho PERS	MOSERS	Oregon PERS	Utah RS
Illinois MRF	Nevada PERS	Pennsylvania PSERS	Virginia RS
Indiana PERF	New Hampshire RS	Pennsylvania SERS	Washington State DRS
Indiana State TRF	New Jersey DPB	San Bernardino Cnty	Wisconsin DETF

U.S. System Sizes: Active Members & Annuitants



- U.S. systems range in size from 27,500 to 1.3 million active and annuitant members. The average size is 293,000 and the median is 217,000. The number of active and retired members is used as a proxy for system size. Deferred members are excluded from the analyses because they incur very low costs versus active/retired members and are therefore less relevant.

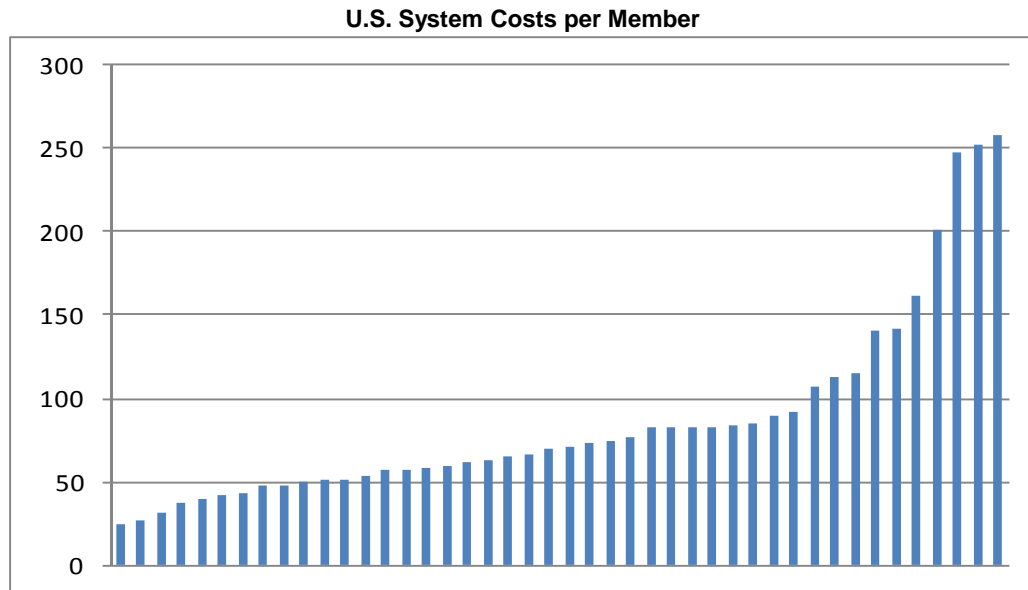
Global systems

- The 89 global systems in the CEM database include 45 American, 22 European, 13 Canadian and 11 Australian.
- They range in size from 9,200 to 1.8 million active and annuitant members. The average size is 259,000 and the median is 147,000.



Cost per member

Pension administration cost includes the cost of the activities listed below in administering pension plans. It does not include the cost of managing investments nor health care and other supplemental benefits. Cost per member is calculated by dividing a system's total costs by the number of active and retired members.



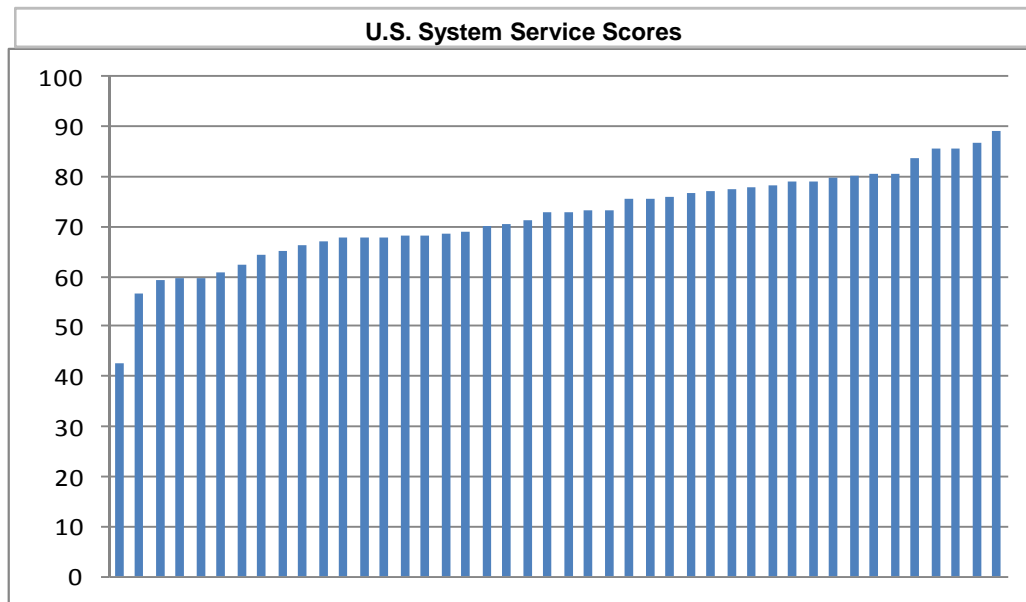
- Among U.S. systems, the cost per member ranges from \$24 to \$258, with an average of \$87 and a median of \$67.
- Globally, the cost in U.S. dollars per member ranges from \$24 to \$546, with an average of \$122 and a median of \$92.

The costs of the following activities are included in the cost per member calculation.

- Disability
- Employer services
- Major projects averaged over a 3-year period to reduce the impact in any single year.
- Collections & data maintenance
- Member transactions
 - Paying annuity pensions
 - Annuity pension inceptions
 - Refunds, transfers out, terminations
 - Purchases, transfers in
- Communication to members
 - Pension benefit estimates.
 - 1-on-1 and group counseling
 - Member contact: calls, emails, letters
 - Mass communication
- Governance & planning
 - Fin'l control & governance
 - Plan design and rule development

Service levels

Service is defined as anything a member would like, before considering costs. CEM's service scores are absolute measures scored out of 100.



- Service scores for U.S. systems range from 43 to 89. The average is 72 and the median is 73.

CEM has a 2-step process for generating these scores. Funds that do not provide a service receive a zero score for that service.

1. Each activity for each system is scored using the following criteria.

- Faster is better, all else equal. For example, systems with lower wait times for calls get a higher score.
- More of a desired service is better: systems that offer counseling in the evenings get a higher score.
- Red tape, restrictions and irritants are negative: systems that require notarization of pension applications get a lower score.
- Making a task easy for members is better: systems that offer more online transactions get a higher score.
- Surveying member satisfaction is essential.

2. A total service score for each system is calculated by applying weights to the scores of each activity. The following criteria are taken into account in setting the weights for each activity:

- | | |
|---|---|
| • Feedback from the systems | • Amount of human contact |
| • Relative cost of each activity | • Relevance to members' financial situation |
| • How critical it is to providing pensions | • Relative volume of each activity |
| • Expectations based on non-pension service providers | |

D. ANALYSES

1. Do larger systems cost less per member than smaller ones?

a) Regression analysis

To answer this question, the cost per member is regressed against the system size for U.S. systems. Following are the results.

	# Systems	Coefficient	t statistic ¹	r-squared ²
U.S. system size: log 10 of active & retired members	44	-36.60	-1.65	6%

These regressions indicate that, as system size increases, there is a cost saving that is significant just below the 95% confidence level. We see that for U.S. systems, for every tenfold increase in the number of active and retired members, cost per member is expected to fall by \$36.60. In other words, if a system were to grow from 100,000 to 1,000,000 active and retired members, costs would be expected to fall by approximately \$37 per member.

However, the r-squared statistic in this regression indicates that system size accounts for only 6% of the change in cost as systems grow. Additional research by CEM indicates that system size is not the biggest driver of costs: the key driver is transaction volumes per member, or the amount of work done by a system. There are large variations in costs between systems of the same size and these differences are largely due to different transaction volumes.

It is also likely that as fund size increases, so do diseconomies of scale due to the effects of excessive bureaucracy and organizational complexity. This could imply either or both of the following, neither of which we are able to confirm:

- Larger systems are less efficient due to overstaffing and excessive structure, and/or
- Larger systems are inherently more complex to administer, so that large IT investments, for example, become more expensive to handle that complexity.

The same regression is run on all the global systems, including the U.S. systems, in the CEM database:

	# Systems	Coefficient	t statistic ¹	r-squared ²
Global system size: log 10 of active and retired members	89	-108.48	-6.80	35%

For every tenfold increase in the number of active and retired members, the cost per member is expected to fall by \$108. This shows a higher impact of \$108 per member. The statistical significance is stronger, and this is likely due to the higher number of very small funds in the CEM global database (please see page 3) than in the U.S. Generally, we find that funds with fewer than 30,000 members experience much higher economies of scale.

Footnotes

1. The t statistic indicates whether or not a variable is useful in predicting costs. Generally, a t statistic with an absolute value greater than 1.68 (i.e., either greater than 1.68 or less than -1.68) indicates that the variable is significant at the 95% confidence level.

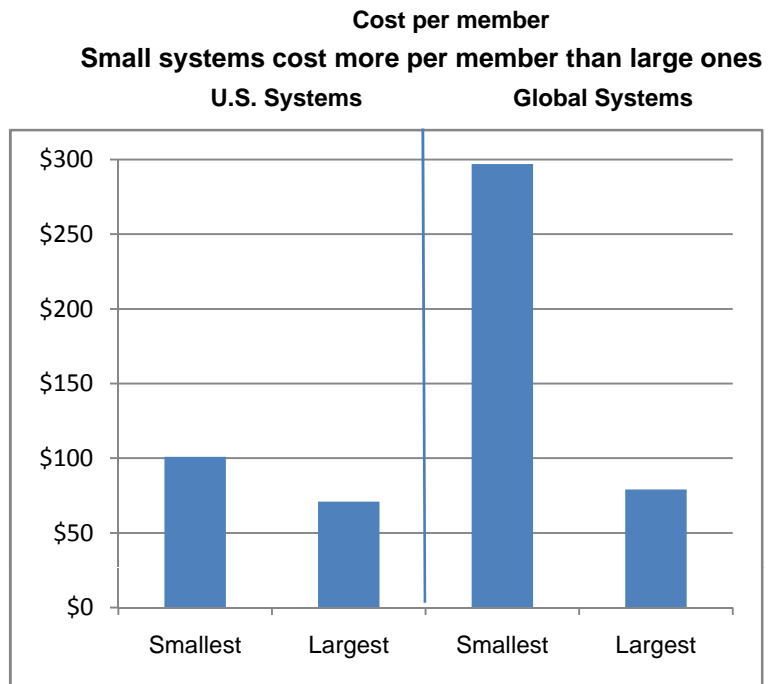
2. The r-squared indicates the amount of differences in cost that a variable explains. The greater the r-squared, the higher the explanatory power. For instance an R-squared of 36% means that 36% of the differences in cost are explained by that variable alone.



1. Do larger systems cost less per member than smaller ones? (cont'd)

b) Direct comparison

A simple comparison of the costs of the ten largest U.S. and global systems against the ten smallest further supports the regression results.



	U.S. Systems		Global systems	
	Smallest	Largest	Smallest	Largest
Average cost per member in U.S. dollars	\$101	\$71	\$297	\$79
Average number of active and retired members	69,425	750,082	18,412	972,634

- The 10 smallest U.S. systems cost \$30 per member less than the ten largest. Globally, the cost difference is much larger at \$218 per member. One reason for this difference is the larger size of the smallest U.S. systems: they are almost four times as large as the smallest global systems.
- The global systems in our database have a much wider range of sizes than the U.S. alone. This is material if you would like a better understanding of system behaviour for sizes outside those in our U.S. database, especially at the small end of the range.

2. Do larger systems provide a higher level of service for their members than smaller ones?

a) Regression analysis

To answer this question, the pension system total service score is regressed against the size of U.S. systems.

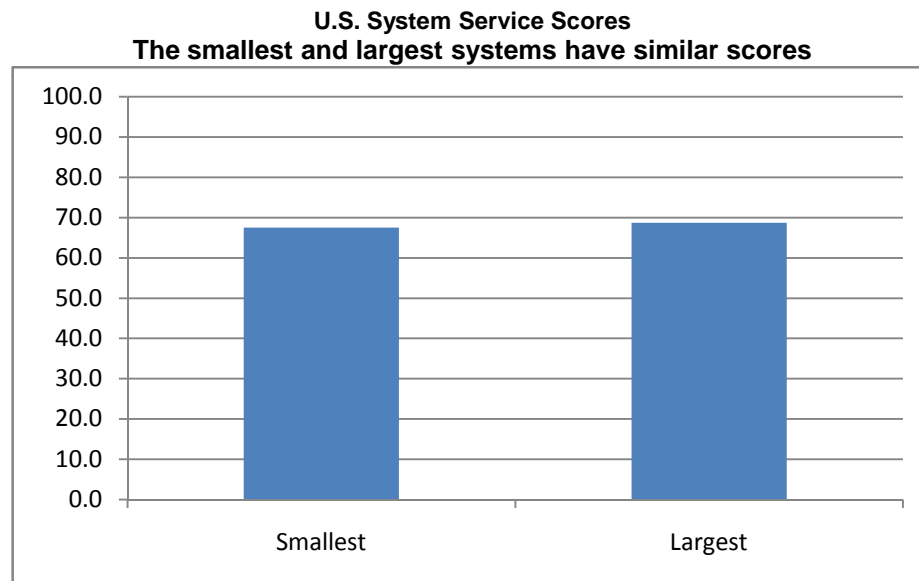
Following are the results.

	# Systems	Coefficient	t statistic ¹	r-squared ²
Pension system total service score	44	0.00	-1.11	3%

Pension service scores do not increase with size: the zero coefficient generated by this analysis indicates that there is no correlation between system size and level of service.

b) Direct comparison

A comparison of U.S. system service scores of the ten largest against the ten smallest funds shows a small difference: the largest funds performed slightly better.



	Smallest	Largest
Average service score for U.S. systems	67.5	68.7
Average number of active and retired members	69,425	750,082