WHAT DO WE KNOW ABOUT THE UNIVERSE OF STATE AND LOCAL PLANS?

By Alicia H. Munnell, Kelly Haverstick, Mauricio Soto, and Jean-Pierre Aubry*

INTRODUCTION

Several surveys report data on public pension plans, but they tend to focus on the 120 major state systems and some include a sampling of locally administered plans. The Census of Governments is the only source that reports on the entire universe of state administered plans, in addition to more than 2,000 locally administered plans. This *brief* describes that population, reports on the investment performance of different types of public plans, and compares the investment performance of public and private plans.

A DESCRIPTION OF THE CENSUS DATA

A Census of Governments is undertaken at five-year intervals.[1] The Census includes a volume on *Employee-Retirement Systems of State and Local Governments*, which provides data on revenues, benefit payments, assets, holdings and membership of the employee retirement systems. The strength of this publication is that it identifies 2,670 retirement systems that are sponsored by a government entity.[2] This information on a vast universe of plans is the only way to assess the extent to which surveys are representative and to calculate the proportion of assets and membership covered by the surveys. Because the Census contains no data on pension liabilities, it is not possible to determine the funding status of plans. Nevertheless, the Census data provide a useful overview of the retirement landscape in the public sector.

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Plans, Participants, and Assets by Level of Government

The Census identifies plans by the level of adminis-
tration — state or local. Most local plans (88 percent)
are administered by municipalities and townships,
with the remainder by counties, special districts and
school districts. The state systems usually cover
general state government employees and teachers;
locally-administered systems often cover police and
fire as well as general municipal employees. But the
structure varies enormously. Some states (Maine and
Hawaii) have a single system covering all types of em-
ployees, while other states (Florida, Illinois, Michigan,
Minnesota and Pennsylvania) have over a hundred
systems.

The stylized fact that emerges from the data is that
state-administered plans account for a tiny fraction
of the plans but almost all the participants and assets
(see Figure 1). Specifically, state-administered plans
account for only 8 percent of total plans, but 88 per-
cent of the active members and 82 percent of assets.

Figure 1. State-Administered Plans as a Percent of Total State and Local Plans, Active Members, and Assets, Fiscal Year 2002
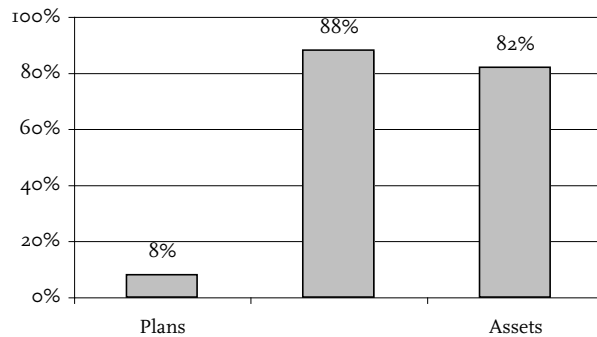
Source: Authors' calculations from U.S. Census Bureau, *Employee-Retirement Systems of State and Local Governments,* 2002.

Thus, as a generalization, state plans are big and
locally-administered plans are small. On average in
2002, state plans held $8 billion in assets, while local
plans held $0.2 billion (see Figure 2). Of course,
every generalization has notable exceptions. Seven
locally-administered plans held over $8 billion each;
leading the list were New York City Employees and
New York City Teachers with about $40 billion each.[3]

Figure 2. Average Assets per Plan by Type of Administration, Billions, Fiscal Year 2002
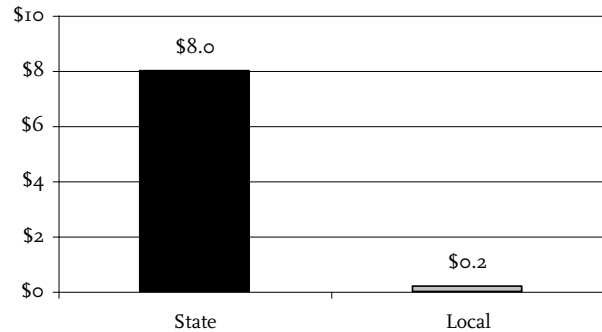
Source: Authors' calculations from 2002 *Employee-Retirement Systems.*

While local plans on average tend to be small, they
hold substantially more assets per active employee
than state-administered plans (see Figure 3). The
most likely explanation is that these plans often cover
police and firefighters, who have physically demand-
ing jobs and are allowed to retire at earlier ages and
require more extensive disability protection.

Figure 3. Assets per Active Worker by Level of Administration, Fiscal Year 2002
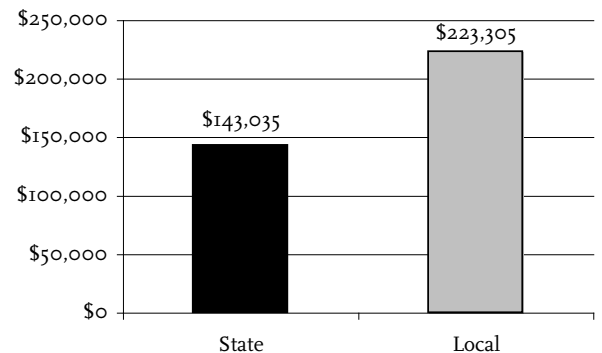
Source: Author's calculations from 2002 *Employee-Retirement Systems.*

Trends over Time

The Census volume on *Employee-Retirement Systems of State and Local Governments* began in 1957 and has been undertaken every five years since then. This long history permits a glimpse at the development of the state and local pension system. The first state or local plan dates from 1857, when New York City provided lump sum benefits to policemen injured in the line of duty.[4] Many municipalities created plans during the last half of the nineteenth century, including a number of systems for teachers. In 1911, Massachusetts developed the first state system to cover its general government employees, but the major expansion of coverage came in the wake of the 1935 federal Social Security legislation. During the 1930s and 1940s, nearly half of the large state and local plans were established or significantly restructured (see Figure 4). By the early 1960s, most states and localities had established their pension systems.

Figure 4. Percent of Large State and Local Systems that Were Established or Significantly Restructured by Date
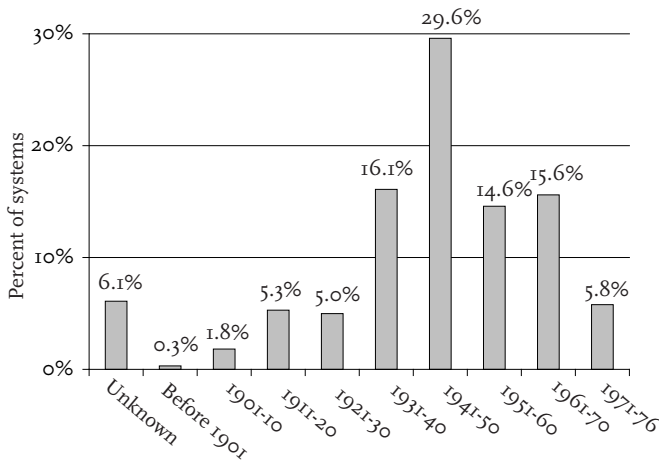

Source: U.S. Congress (1978).

State and local government employment roughly doubled between the early 1960s and the mid-1970s, resulting in an enormous growth in the population covered by state and local pension plans. This growth, combined with interest in private plan reform that culminated in the 1974 passage of the federal Employee Retirement Income Security Act (ERISA), focused attention on public pensions.

ERISA mandated a study to determine whether public plans needed further regulation. The 1978 *Pension Task Force Report on Public Employee Retirement Systems* did not result in the extension of federal regulation to governmental plans, but it did document the status of public systems and spurred an increase in funding efforts. Since 1980, assets per worker have more than doubled at both the state and local levels (see Figure 5).

Figure 5. Assets per Active Worker by Level of Administration, Fiscal Years 1957-2002 (2002 dollars)
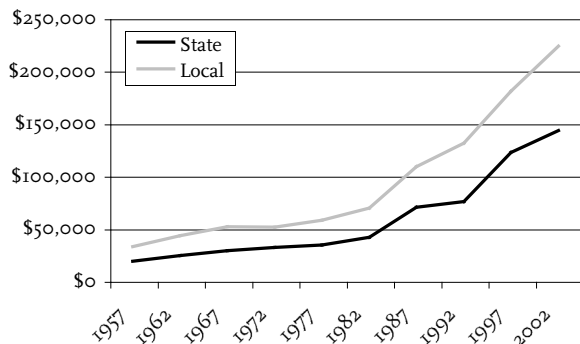
Note: Assets are at market value for 2002 and book value prior to 2002.
Source: Authors' calculations from 1957-2002 *Employee-Retirement Systems.*

Rates of Return

The data provided in the Census of Governments also make it possible to estimate rates of return. The formula for calculating rate of return is one commonly used by actuaries.[5] It relates the change in assets $(A_t - A_{t-1})$, netting out the impact of benefit payments from the plan (B) and contributions to the plan (C), to initial assets (A_{t-1}) plus half of net inflows $(C - B)$:

$$\text{Rate of return:} \quad \frac{(A_t - A_{t-1}) + B - C}{(A_{t-1}) + 0.5 * (C-B)}$$

Returns, even median returns, can be calculated in a number of ways. The analysis presented below calculates the geometric return for each public plan over the period 1994-2004 — the period for which the Census of Governments provides plan data for a large number of plans. The average annual rates of

return over this period are shown in Figure 6. Over the entire period, state and local plans yielded an average return of 9.3 percent per year. The return, however, varied by plan size; plans holding less than $500 million produced average returns of 9.0 percent and those with assets of more than $1.5 billion produced 10.2 percent.

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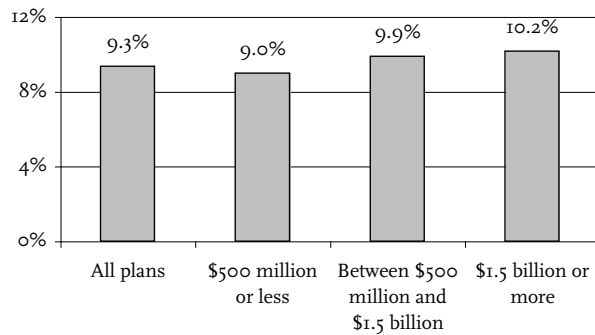

Note: These returns are the median of the geometric mean of the returns for the calendar years 1994 to 2004, excluding 2001 and 2002 due to the change in reporting in the Census data. See Appendix for more details.
Source: Authors' calculations from 1993-2005 *Employee-Retirement Systems*.

The Census data combined with the Department of Labor's Form 5500 filings also enable us to compare the returns on public sector and private sector defined benefit plans. Two factors will be important in determining returns.[6] The first, as noted above, is the size of the plan; big plans tend to be run more efficiently and have higher returns. In fact, over the period 1994-2004, the average administrative expenses amounted to 0.26 percent of assets for large public plans compared to about 0.43 percent for middle-sized and 0.48 percent for small public plans. The data show that the public sector has more assets than the private sector in plans with more than $1.5 billion (see Figure 7). Therefore, all else equal, one would expect overall returns to be higher in the public sector.

FIGURE 7. PERCENT OF ASSETS IN SMALL, MEDIUM, AND LARGE PLANS, BY SECTOR, 2002
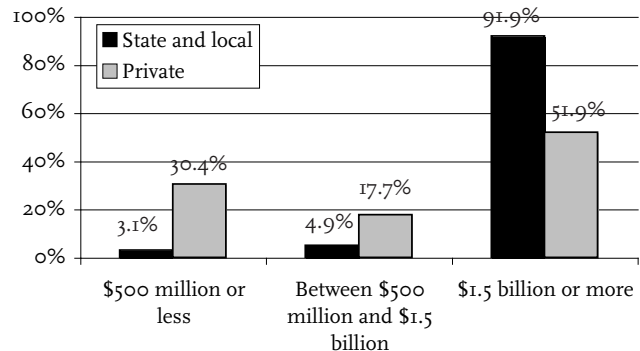
Note: These data are for plans with at least 100 participants in the calendar year 2002. See Appendix for more details.
Sources: Authors' calculations from 2002 *Employee-Retirement Systems*; and U.S. Department of Labor, Annual Return/Report Form 5500 Series, 2002.

The second factor that will affect investment performance is the percent of assets held in equities, since equities have produced higher returns — albeit with higher risk. The Census data show slightly higher equity holdings in the public sector than the private sector (see Figure 8).[7] This finding would also lead one to expect public returns to be higher.

FIGURE 8. PERCENT OF PENSION ASSETS INVESTED IN EQUITIES, BY SECTOR, 1994-2004
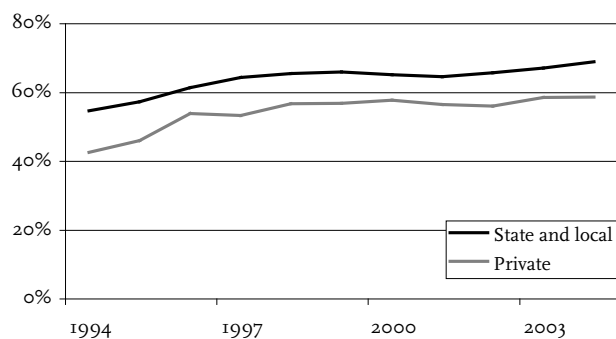
Note: These data are for plans with at least 100 participants in calendar years 1994-2004. See Appendix for details.
Sources: Authors' calculations from 1994-2004 *Employee-Retirement Systems*; 1994-2004 Form 5500 Series; and Standard and Poor's (1996-2004).

The results of a regression that relates each public and private plan's return over the period 1994-2004 are presented in Figure 9. (See Appendix for details on the methodology.) The coefficients show that the

FIGURE 9. EFFECT ON THE REAL RATE OF RETURN, 1994-2004
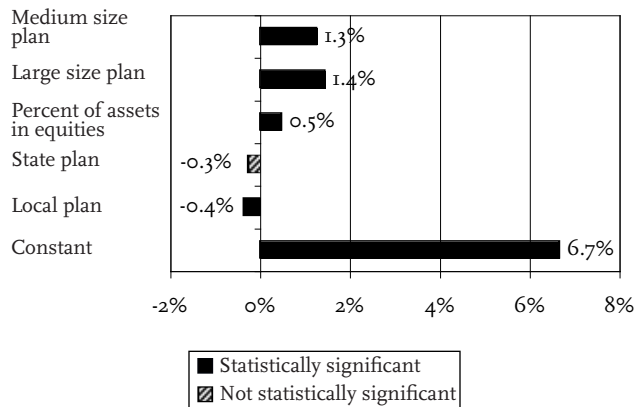
Note: The marginal effect for percent in equities is for a 10-unit change. See Appendix for more details.
Sources: Authors' calculations from *Employee-Retirement Systems* U.S. Census Bureau, 1993-2005 and U.S. Department of Labor, 1993-2004.

size of the plan is the main factor that determines returns — large plans have returns about 1.4 percentage points higher than small plans. Returns are also positively related to the percent of assets held in equities. The coefficient on equity exposure suggests that a 10-percentage-point increase in equities increases annual returns by about 0.5 percentage points. Once size and equity holdings are taken into account, the difference between a state-administered plan in the public sector as compared to a plan in the private sector is not statistically significant. There is, however, a small but significant difference between local public plans and private plans — returns for local public plans are 0.4 percent lower than for private plans.[8] However, another specification using annual real returns as the dependent variable shows no significant difference between public and private plans once size and equity holdings are taken into account. Thus, it would be hard to argue that public plans fare any better or worse than private plans in terms of investment returns.

CONCLUSION

The Census of Governments has produced data on the revenues, benefit payments, assets, holdings and membership of public employee retirement systems every five years since 1957, with annual updates for a subsample since 1992. These data are valuable because they include the most complete list of plans sponsored by a public entity, thereby providing a benchmark against which to assess the comprehensiveness of surveys. They also can be used to identify differences in plan characteristics by level of administration and plan size. And, because they have both the stock of assets and flow of contributions and benefits, they can be used to calculate returns. Returns among public plans show that size is generally important — the larger the plan, the higher the return. Comparing the returns of public and private plans produced no significant differences once plan size and asset composition were taken into account.

The drawback of the Census data is that they include no information on liabilities, so it is impossible to draw any conclusions about funding behavior. The Census would be substantially more valuable if it included such information. Funding, however, remains important and future *briefs* will address the funding question using survey data.

Endnotes

1 Since 1992, the data have been updated every year with a survey administered to a subsample of the population.

2 These 2,670 retirement systems cover nearly 99 percent of the total assets held by state and local retirement plans. The definitions used in Census Bureau statistics about governments can vary considerably from definitions applied in standard accounting reports. Plans covering less than 10 individuals or with less than $3 million in assets are generally excluded. With respect to plan type, the Census data almost exclusively cover defined benefit plans. Prior to fiscal year 2005, the data also included the income and assets of some defined contribution plans and some health care plans. The Census Bureau estimates that, in 2004, the inclusion of these plans overstated assets by about 1.4 percent. Given the recent growth in these plans, any overstatement was clearly smaller in previous years.

3 The other large locally-administered plans are Los Angeles County Employees ($27 billion), New York Police ($15 billion), Los Angeles Fire and Police ($11 billion), San Francisco City and County Employees ($10 billion), and Chicago Public Schools ($9 billion). See U.S. Census Bureau (2002).

4 See Bleakney (1972).

5 See Munnell et al. (2006) for more details about this formula.

6 Previous research generally focuses on the effect of political influence and governance on returns (see Coronado, Engen, and Knight (2003); Mitchell and Hsin (1997); Munnell and Sundén (2001); Romano (1993); and Yang and Mitchell (2005)).

7 The Flow of Funds data for private plans show a jump in equity holdings of about 8 percentage points between 1999 and 2000. The data used in this brief — which come from the Form 5500 and Standard & Poor's — replicate the Flow of Funds data until 1999, but do not suggest a jump of a similar magnitude. After 2000, the trends followed by the two data series are similar, but the difference arising from the 1999-2000 jump remains.

8 Coronado, Engen, and Knight (2003) find that public plans have lower returns than private plans. Their analysis, however, does not distinguish between state and local plans and uses a smaller sample of public sector plans (PENDAT).

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APPENDIX

Appendix. Data and Methodology for Rate of Return Regression Anaylsis

The sample includes annual data for plans between 1993 and 2004. The state and local plan data are from the Census of Governments, while the private data are from the U.S. Department of Labor's Form 5500.

The regression analysis estimates the effects of the size of the plan, the percent of assets held in equities, and whether the plan covers private or public workers on the geometric mean return for the period 1994-2004. The Form 5500 data are limited to private plans with at least 100 participants, so, for comparability, this size cutoff is used for public plans in the sample as well. An additional measure taken for comparability between private and public plans is that, although both report data by fiscal year, most private plans have a fiscal year that is the same as the calendar year while many public plans have fiscal years of July to June. The public plans' data were approximated to calendar years by taking half of the current fiscal year value plus half of the following fiscal year value.

Another adjustment was made to the Census data in order to ensure that equities are reported on a consistent basis. The Census reports assets at book value prior to 2002 and at market value beginning in 2002. The Census also includes information on equities at market value and equities at book value prior to 2002. All public plans included in the regression had pre-2002 equities adjusted to market value. Since corporate bonds were only measured at book value prior to 2002, no adjustment to market value was possible.

Geometric Returns

The dependent variable in the regression is the geometric mean of the real return over the period 1994-2004. Returns from 2001 and 2002 are excluded due to the change in the valuation method of corporate bonds in the Census data. Aggregate returns for the full period are presented in Table A1.

Size of Plan

Plans were divided into one of three size classifications according to their assets: $500 million or less, between $500 million and $1.5 billion, and $1.5 billion or more. For the regression, the size of the plan corresponds to the level of assets at the start of the period (1993).

Table A1. Aggregate Real Returns, by Sector, 1994-2004

Year	Public	Private
1994	10.01 %	-1.25 %
1995	11.15	16.75
1996	14.94	14.61
1997	17.36	11.91
1998	13.42	13.95
1999	9.87	9.33
2000	1.66	-1.96
2001	-5.50	-6.82
2002	-3.01	-7.54
2003	7.61	15.78
2004	11.34	8.34
Geometric mean (excluding 2001-02)	**10.73**	**9.51**

Note: The returns for 2001 and 2002 were excluded from the regression due to lack of comparability in the measurement of assets for public plans. The numbers above for public plans in 2001 and 2002 are not consistent with other years since the bond valuation method differs in the comparison years.
Source: Authors' calculations.

Percent of Assets in Equities

The percent in equities is the value of equities as a proportion of the value of assets for a plan. For public plans, equities are identified following the Flow of Funds methodology (Equities = Corporate Stocks + Trust Investments + Other Securities + Other Investments + 90 percent of Foreign Stocks). For private plans, the asset allocation data come from two sources. The first is the Form 5500 data. Using these data, we estimate the percent held in equities for pension plans in which allocation is known for at least 75 percent of their assets — a weakness of the Form 5500 data is that a large part of assets are reported as "common/collective trusts," "pooled separate accounts," and "master trust investments." The second source of data for asset allocation of private plans is the Standard and Poor's Money Market Directory (MMD). We merge the asset allocation reported in the MMD data into the Form 5500 data. The resulting dataset — Form 5500 plus MMD data — contains asset allocation for plans that hold about 60 percent of the total assets reported in the 5500 data. For the remaining

plans, the asset allocation is imputed based on asset level and a dummy for each year. For the regression, the percent in equities used is the percent in equities at the start of the period (1993).

Private / State / Local plans

The variable for state plans in the regression is a dummy variable that takes the value of 1 for state plans and 0 for local or private plans. The variable for local plans takes a value of 1 for local public plans and 0 for state or private plans. Private plans are the comparison (excluded) group.

The estimation results for the cross-sectional regression are reported in Table A2 below. Of the 5,861 plans included in the regression, 5,489 are private, 247 are local public, and 125 are state public plans.

TABLE A2. CROSS-SECTIONAL REGRESSION RESULTS

Variable	Coefficient
Medium size plan	0.01261**
	(0.00154)
Large size plan	0.01448**
	(0.00200)
Percent of assets in equities	0.00482**
	(0.00020)
State plan	-0.00275
	(0.00238)
Local plan	-0.00367*
	(0.00158)
Constant	0.06670**
	(0.00079)
Adjusted R-squared	0.1153
Number of observations	5,861

Note: Standard errors are in parentheses. Coefficients are significant at the one percent level (**) or five percent level (*).
Source: Authors' calculations.

The estimation results for the panel regression on each year's return are reported in Table A3 below. This regression includes 64,460 observations — 11 years of data for 5,494 private plans, 242 local plans, and 124 state plans. It is a random effects specification with the standard errors adjusted for within-plan

correlation. The size of the plan is based on assets at the beginning of each year. The percent of assets in equities is also measured at the beginning of each year. A set of year dummies were also included for which all coefficients were significant and of the expected sign relative to the omitted year (2004). Finally, as noted above, the returns for 2001 and 2002 of public plans are based on assets that are measured differently. A dummy variable designating a return for a public plan in either 2001 or 2002 is included to control for this. Results are similar except that the coefficients for both state and local plans are not significant.

TABLE A3. PANEL REGRESSION RESULTS

Variable	Coefficient
Medium size plan	0.00915**
	(0.00107)
Large size plan	0.01046**
	(0.00140)
Percent of assets in equities	0.00363**
	(0.00019)
State plan	-0.00092
	(0.00177)
Local plan	0.00017
	(0.00172)
Public plan in 2001 or 2002	0.02302**
	(0.00438)
Constant	0.04358**
	(0.00109)
Within R-squared	0.5937
Between R-squared	0.1510
Overall R-squared	0.5767
Number of observations	64,460

Note: Standard errors are in the parentheses. Coefficients are significant at the one percent level (**).
Source: Authors' calculations.

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The Center for Retirement Research at Boston College was established in 1998 through a grant from the Social Security Administration. The Center's mission is to produce first-class research and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

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