CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Office of the City Auditor
Sharon W. Erickson, City Auditor

November 21, 2017

Honorable Mayor and Members
Of the City Council
200 East Santa Clara Street
San José, CA 95113

SUPPLEMENTAL MEMORANDUM: AUDIT OF RETIREMENT SERVICES

Reason for Supplemental

To provide additional information regarding the retirement plans' investment performance.

Background

In February 2017, the City Council approved the Mayor's request for an audit of the administration of the Office of Retirement Services and the retirement plans as well as an external review of the investment performance of San José's pension plans. On October 12, 2017, this office published a report that addressed the request to review the administration of the Office of Retirement Services. The attached report, issued by the Stanford Institute for Economic Policy Research (SIEPR), addresses the Mayor's request for an external review of the plans' investment performance.

Summary of SIEPR Report Results

The analysis conducted by SIEPR compares San José's retirement plans to eight other public plans with similar levels of plan assets. The researchers concluded:

- Funded status – The funded status of San José's retirement plans has deteriorated in recent years. San José is not unique among public plans in this respect. Portfolio management is one tool to address the funding gap.

- Asset allocation – Over the past decade, portfolios across the public pension plan system have evolved, and San José's target asset allocations moved away from traditional equities and fixed income, and into alternative asset classes. Compared to the peer plans, San José allocated 17 percent less to public equities and considerably more to absolute return strategies; both plans held meaningfully more cash relative to their peers and to the plans' own target allocations. The researchers analyzed hypothetical situations finding that changes to either the weighting of assets and/or the actual investments could have improved performance.

- Reliance on investment income – Regarding the plan demographics, the report states that San José's plans' ratio of beneficiaries (eligible or currently drawing pensions) to active members (who are contributing funds into the plans) is higher and growing more quickly than other jurisdictions, over time this will make investment income increasingly important to make up the plans' negative cash flows.

- Investment performance and risk – San José's plans underperformed the peer plans when looking at 1-year, 3-year, 5-year, and 10-year returns, and in the majority of asset classes. The researchers found that on a risk-adjusted basis (the Sharpe ratio), San José's retirement plans' were in the middle of the range relative to the peer group.

- Investment expenses – Lastly, the report notes that investment expenses for San José's plans have increased relative to assets in recent years and that the plans are among the more expensively managed of the peer group.

Report Conclusion

The report concludes that San José's plans are particularly sensitive to weaker investment performance and current income because of the shortfall of contributions relative to benefit payments. While San José's plans have increased allocations to longer-duration investments, the researchers state: "it is questionable whether the allocations to alternative asset classes have been done in the most optimal way." Because poor investment performance affects both the potential growth in assets and could lead to a decrease in the discount rate—which in turn expand the funding gap—the report closes by stating that the plan fiduciaries should have particular focus on investment strategy and management.

We would like to thank the team of researchers at SIEPR for their time, insight, and analysis.

Respectfully submitted,

Sharon W. Erickson
City Auditor

SE:lg
03591

Attachment: Analysis of City of San José Retirement Plans Investment Portfolios (SIEPR)

Stanford | Institute for Economic Policy Research (SIEPR)

Analysis of City of San Jose Retirement Plans Investment Portfolios

Joe Nation, Ph.D.

Olympia Nguyen Tulloch

Clive Lipshitz

November 20, 2017

Working Paper No. 17-039

Analysis of City of San Jose Retirement Plans Investment Portfolios

City of San Jose Police and Fire Department Retirement Plan
San Jose Federated City Employees' Retirement System

Joe Nation, Ph.D.*
Olympia Nguyen Tulloch
Clive Lipshitz
November 20, 2017

*Nation is the Project Director for Pension Tracker; Nguyen is the Pension Tracker Project Manager; Lipshitz served as a consultant for this Working Paper. Sydney Maples and Nicolas Pena Brown served as Research Assistants for this Paper. Greg Rosston reviewed this Working Paper.

Analysis of San Jose Retirement Investment Portfolios

Introduction

San Jose voters approved a 2016 tax increase in part on an assertion that incremental revenues were necessary to fund maintenance of essential infrastructure and enhance emergency services. In practice, however, much of the incremental revenues is being directed to the City's underfunded public pension plans.[1]

This Working Paper analyzes San Jose's two public pension plans: the City of San Jose Police and Fire Department Retirement Plan (referred to herein as "Police & Fire"), and the City of San Jose Federated Employees' Retirement System (referred to herein as "Federated"). The methodology we use is a financial statement-based evaluation. We examine numerous factors, including funded status and the impact of discount rate assumptions, asset allocation, investment performance, the impact of demographics and employment, the impact of (and on) stakeholders (employees, retirees, and taxpayers), and the efficiency of investment office management. To provide context, we evaluate the San Jose plans within a peer group of public pension systems with similar levels of plan assets. This includes public plans sponsored by various San Francisco Bay Area counties and by cities in other parts of the country. Our actuarial analysis is based on data as of the end of the most recent Fiscal Year (FY), as specified in Table 1. Performance data reflect the calendar year ending December 31, 2016 unless otherwise noted.

[1] Giwargis, Ramon, "Will San Jose's pension costs consume revenue from new taxes?" *San Jose Mercury News*, February 20, 2017, http://www.mercurynews.com/2017/02/20/will-san-joses-pension-costs-consume-revenue-from-new-taxes/. Conversations with city staff confirm that a large share of new revenues are funding pension costs.

Table 1 – Peer Group, Select Metrics

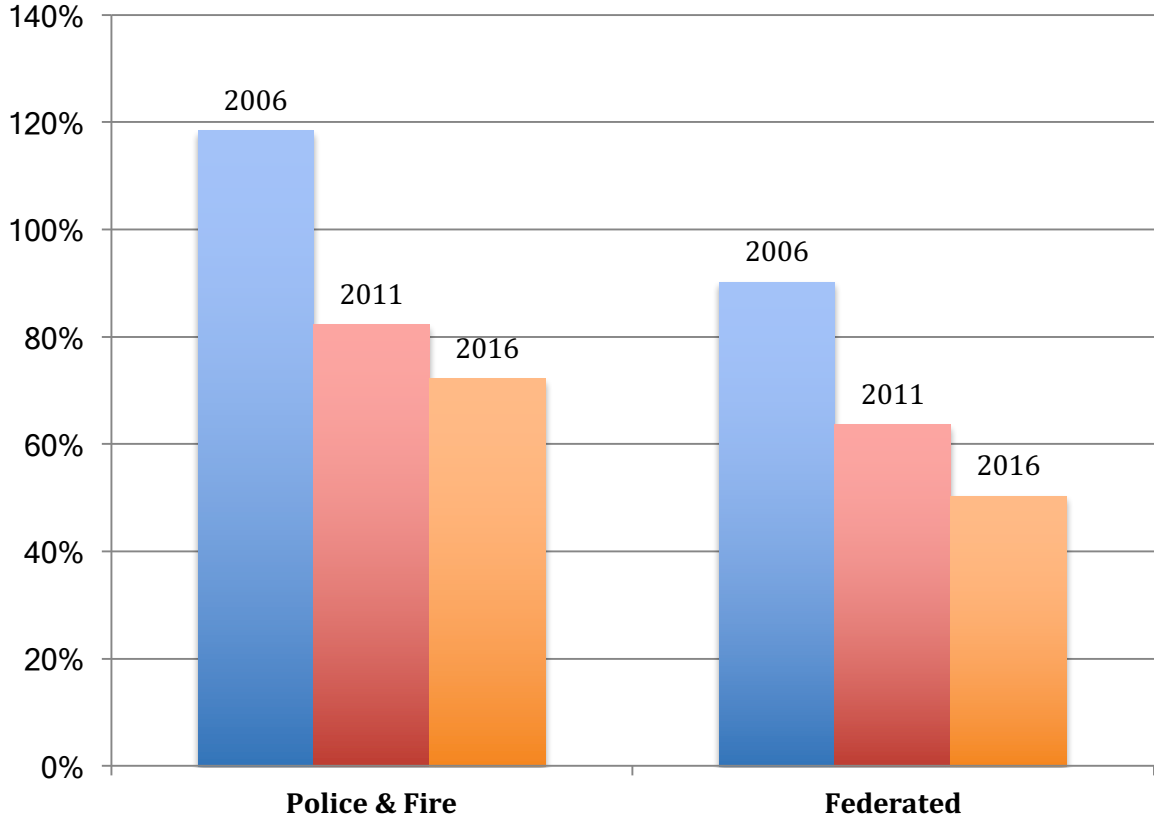
	Pension Liability $mm	Plan Assets $mm	Funded Ratio	Members	As of Date	Municipal Population mm
City of San Jose Police and Fire Department Retirement Plan (Police & Fire)	4,220	3,044	72.1%	3,731	Jun-16	1.03
City of San Jose Federated City Employees Retirement System (Federated)	3,692	1,859	50.4%	7,300	Jun-16	1.03
Seattle Employees Retirement System (SCERS)	3,793	2,489	65.6%	15,533	Dec-16	0.70
Contra Costa County Employees' Retirement Association (CCCERA)	8,839	7,439	84.2%	18,948	Dec-16	1.14
Alameda County Employees' Retirement Association (ACERA)	8,411	6,168	73.3%	19,132	Dec-16	1.65
Fresno County Employees' Retirement Association (FCERA)	5,542	4,009	72.3%	13,446	Jun-16	0.98
San Diego City Employees' Retirement System (SDCERS)	9,609	6,808	70.8%	16,425	Jun-16	1.41
Dallas Police and Fire Pension System (DPFP)	8,491	2,168	25.5%	9,560	Dec-16	1.32
Employees' Retirement Fund of the City of Dallas (Dallas ERF)	4,292	3,352	78.1%	15,730	Dec-16	1.32
District of Columbia Police Officers and Fire Fighters' Retirement Fund (DC Police & Fire)	4,676	4,954	106.0%	8,362	Sep-16	0.68

Source: Pension plan data from Comprehensive Annual Financial Reports. Population data from United States Census Bureau, estimate as of July 1, 2016. Here, and elsewhere, we simplify analyses that make use of member count by including only annuitants (retired members earning benefits) and active members (those paying contributions and not yet receiving benefits); we exclude inactive members not receiving benefits.

Deterioration in Funded Status

The funded status of a pension plan is the ratio of net plan assets to actuarially calculated liabilities. Figure 1 illustrates the deterioration in the funded status of the Police & Fire plan from almost 118% in 2006 to 72% in 2016 and of the Federated plan from 90% to 49% over that period.

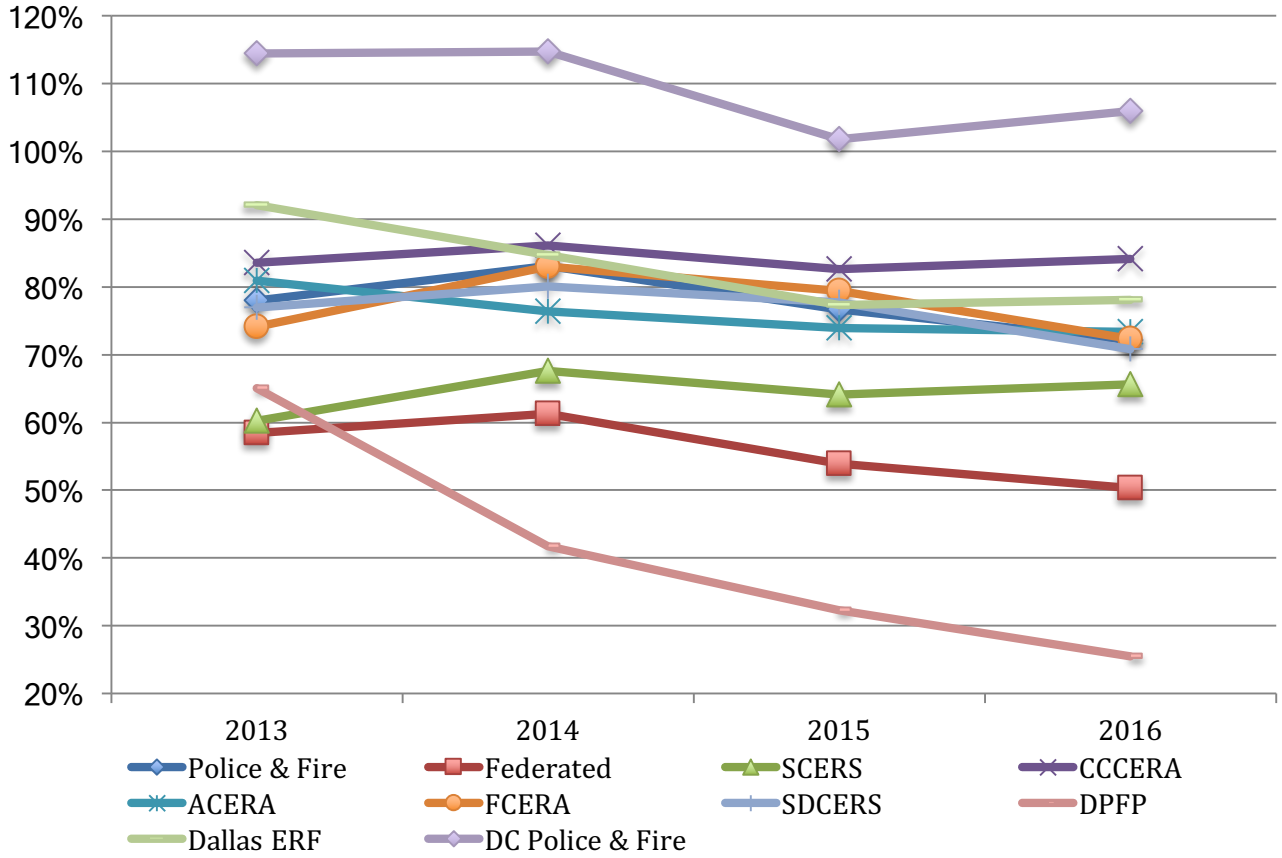
Figure 1 – Funded Status of San Jose Plans (2006, 2011, 2016)



Source: Comprehensive Annual Financial Reports.

This trend is not unique to the San Jose plans; it has been well documented across the U.S. public pension systems. Figure 2 illustrates the funded status of the peer group over the preceding four years.

Figure 2 – Funded Ratios of Peer Group (2013-2016)



Source: Comprehensive Annual Financial Reports.

Framework for Analysis

This decline in funded status is driven by market performance and demographic factors. It is helpful to analyze the impact of these factors through evaluation of plan financial statements, specifically by looking at:

- The diversified portfolio of investments held in trust for beneficiaries, commonly referred to as net plan position, or simply, plan assets;
- Plan liabilities, calculated as the present value of future benefit payments estimated by plan actuaries, discounted by an actuarially-determined rate which, per Governmental Accounting Standards Board (GASB) rules, are generally based on the expected portfolio returns on portfolio of plan assets; and
- Changes in net plan position, which can be thought of as a cash flow statement (although it is reported on an accrual basis) that reflects the net impact on plan assets of inflows from annual contributions by plan members and their employing agencies, outflows from benefit payments to annuitants, plan administration expenses, and the net contribution from plan investments.

Analysis of San Jose Retirement Investment Portfolios

Pension plans with a growing funding gap have three tools at their disposal: benefit reform, contribution policy, and portfolio management. Our analysis focuses on the third of these.

Asset Allocation and Plan Liabilities

The investment program of a pension plan is guided by an Investment Policy Statement approved by the plan's fiduciary (a board comprised of some combination of representatives of the beneficiary population and of the sponsoring municipality, which may include public sector or other political appointees and/or trustees with investment experience). Generally guided by investment consultants, the fiduciary determines a long-term target asset allocation, from which can be determined a weighted-average benchmark return. Investment staff, typically led by a Chief Investment Officer overseen by the fiduciary or an investment committee appointed by the fiduciary, manages the investment program to attempt to earn at least the returns of this benchmark. Various factors go into the formulation of the investment policy, including the structure and duration of plan liabilities as well as liquidity needs. Investment staff manage the portfolio to achieve the investment goals by constructing a diversified portfolio of assets that optimizes returns for a reasonable level of risk. Table 2 illustrates the investment objective and target allocation of each asset class in the San Jose plans' portfolios. We restrict our portfolio evaluation to the level of asset class allocations and do not explore the underlying fund commitments and direct investments made by the plans.

Table 2 – Asset Allocations of San Jose Plans (Current)

Asset class	Objective	Target Allocations Federated	Target Allocations Police & Fire
Global equity	Passive and active strategies on a global basis.	28%	31%
Private equity	Outperformance relative to public equities. Focus on leading managers. Primary fund exposures (up to 80%), co-investments and secondaries (up to 40%). North America (40-55%), Europe (35-45%), rest of world (up to 15%). Diversified across vintage years. Primary fund commitments: buyouts (up to 80%), special situations (up to 30%), venture capital (up to 20%).	9%	8%
Global fixed income	Enhancing returns through low correlation with equity markets, total returns across all market environments, and current income. Global core (25-100%), non-investment grade (up to 50%), emerging market debt (up to 50%).	19%	16%
Private debt	Target S&P Global Leveraged Loan Index + 2%. Senior loans/direct lending (25-100%), mezzanine/ subordinated debt (up to 25%), distressed debt (up to 25%), niche strategies (up to 75%).	5%	11%
Absolute return	Target 3-month Libor + 5% with realized volatility of 4-8%, and a beta to MSCI World Index of less than -.2. Relative value (25-50%), macro/directional (35-75%), equity long-short (up to 10%), event driven (up to 10%).	11%	6%
GTAA/opportunistic	Multi-asset actively-managed strategies, includes "opportunistic" component expressed through tactical short-to-medium term investments on a "best ideas" basis.	5%	10%
Real Assets	Diversification (low correlation), inflation protection. Public, private, active, and passive managers on a direct and fund-of-funds basis, through several sub-asset classes	23%	17%
Real Estate	Core public and private (open-end and closed end), value-add, opportunistic, and debt funds, on a primary fund and fund-of-funds basis, as well as direct property holdings and listed securities.	7%	7%
Commodities	Agriculture, energy, livestock, industrial metals, and precious metals.	6%	7%
Infrastructure	Core, value-add, and opportunistic strategies on a primary fund and fund-of-funds basis, as well as in listed securities, may include debt investments as well as single asset investments.	5%	3%
Natural Resources	Diversification, inflation protection (crude oil, copper, timber, agricultural products).	5%	0%
Cash		0%	1%

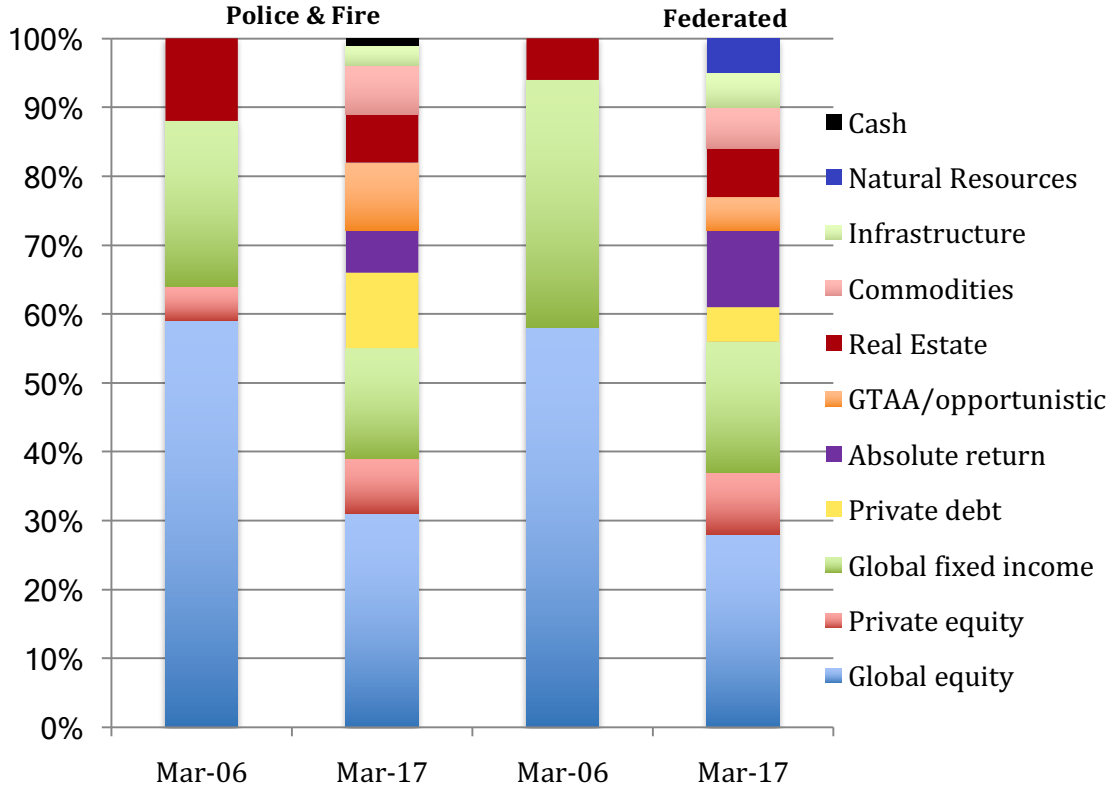
Sources: Investment Policy Statements of the Police and Fire Plan (1/5/17) and the Federated Plan (1/19/17).

Analysis of San Jose Retirement Investment Portfolios

Over the past decade, portfolios across the public pension plan system have evolved. The universe of potential investment instruments has become more sophisticated, and investment officers have become increasingly confident with allocations to more esoteric investment strategies. This has led to increased diversification and allocations to alternative investments[2], including less liquid assets.

Figure 3 illustrates how the target allocations of the San Jose plans evolved between 2006 and 2016. By allocating more to asset classes such as private equity, real estate, and infrastructure, investment programs access return streams beyond those available in the public markets. Additionally, these illiquid asset classes provide investment programs with the benefits of illiquidity premia[3] and are arguably well-suited to match the longer-duration of pension plan liabilities. It has become evident that certain alternative asset classes, such as commodities and absolute return strategies have not generated consistent after-fee returns required to meet pension systems' target returns.

Figure 3 – Target Asset Allocations of San Jose Plans (2006 and 2016)



Source: Comprehensive Annual Financial Reports.

---

[2] There is debate what constitutes an alternative investment. In general, alternative investment assets are not stocks, bonds or cash.

[3] While the academic literature is equivocal about the existence of an illiquidity premium over the very long term; there is research arguing for a premium over the medium term. See for example – Staub, Renato, "Modeling Illiquidity Premiums for Alternative Investments," CFA Institute Conference Proceedings Quarterly, June 2010: 40.

Target allocations are generally expressed in terms of ranges; actual allocations regularly drift slightly from these targets. Reasons for these deviations include tactical decisions to over- or underweight a particular asset class for a finite period of time, the need to rotate into or out of asset classes when allocation targets change, and the latency inherent in drawdown of capital commitments or reinvestment of proceeds from realized gains. Table 3 illustrates the variance between target and actual allocations as at December 31, 2016 for the two San Jose plans.

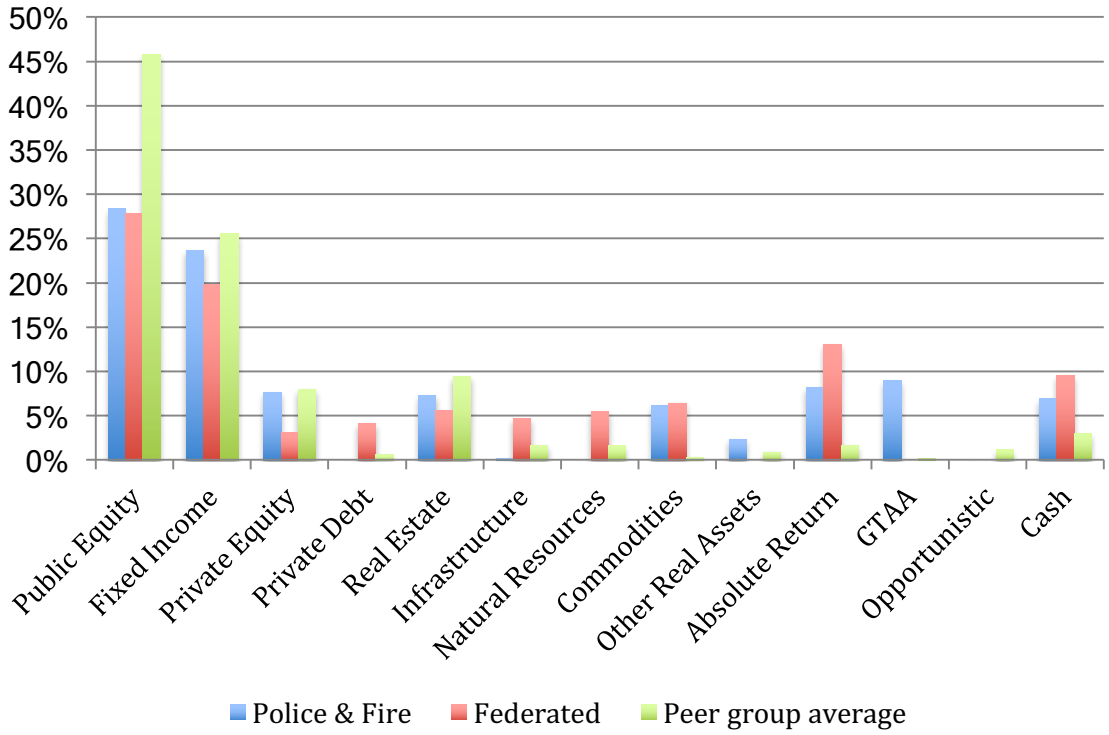
Table 3 – Target and Actual Allocations of San Jose Plans (December 31, 2016)

	Police & Fire				**Federated**		
	Target	**Actual**	**Variance**		**Target**	**Actual**	**Variance**
Global equity	31.0%	30.5%	-0.5%		28.0%	30.6%	2.6%
Private equity	8.0%	7.8%	-0.2%		9.0%	3.0%	-6.0%
Global fixed income	16.0%	16.0%	0.0%		19.0%	19.7%	0.7%
Private debt	11.0%	7.4%	-3.6%		5.0%	4.2%	-0.8%
Absolute return	6.0%	8.4%	2.4%		11.0%	13.8%	2.8%
GTAA/opportunistic	10.0%	9.1%	-0.9%		5.0%	0.0%	-5.0%
Real Estate	7.0%	7.2%	0.2%		7.0%	5.7%	-1.3%
Commodities	7.0%	6.4%	-0.6%		6.0%	6.4%	0.4%
Infrastructure	3.0%	2.4%	-0.6%		5.0%	5.1%	0.1%
Natural Resources	0.0%	0.0%	0.0%		5.0%	5.6%	0.6%
Cash	1.0%	4.8%	3.8%		0.0%	5.9%	5.9%

Source: Target Asset allocations as per Investment Policy Statements of the Police and Fire Plan (1/5/17) and the Federated Plan (1/19/17). Actual asset allocation as per investment consultant report, dated March 31, 2017.

As seen in Table 3, both plans hold meaningfully more cash relative than is budgeted in their benchmark allocations. Additionally, the Police & Fire plan has under-allocated to private debt and over-allocated to absolute return, while the Federated plan has under-allocated to both private equity and global tactical asset allocation strategies (GTAA) and over-allocated to global equity and absolute return. As a point of reference, Figure 4 compares the actual asset allocations of the peer group average.

Figure 4 – Actual Asset Allocations of Peer Group (December 31, 2016)



Source: Consultant reports or investment reports, as of December 31, 2016. Peer group average is the arithmetic mean. Where necessary, we have consolidated asset classes to ensure consistency.

Observations from this comparison include:

- The San Jose plans have allocated approximately 17% less to public equities than the peer group average. One plan (DPFP) has allocated only 7.7% to equities (while another, Dallas ERF, has allocated as much as 60% to the asset class).
- The San Jose plans have allocated considerably more to absolute return strategies than has the peer group (7% more in the case of the Police & Fire plan and 11% more in the case of the Federated plan).[4] The Police & Fire plan has allocated 9% to the GTAA strategy, which is not reported as a distinct allocation among other plans.
- The San Jose plans have significantly larger cash holdings than the other plans. DPFP plan held 13.7% in cash at December 31, 2016 (likely because of the need to fund substantial withdrawals by retirees, particularly Police & Fire).[5] It is also the weakest performer among these plans for all reporting periods.

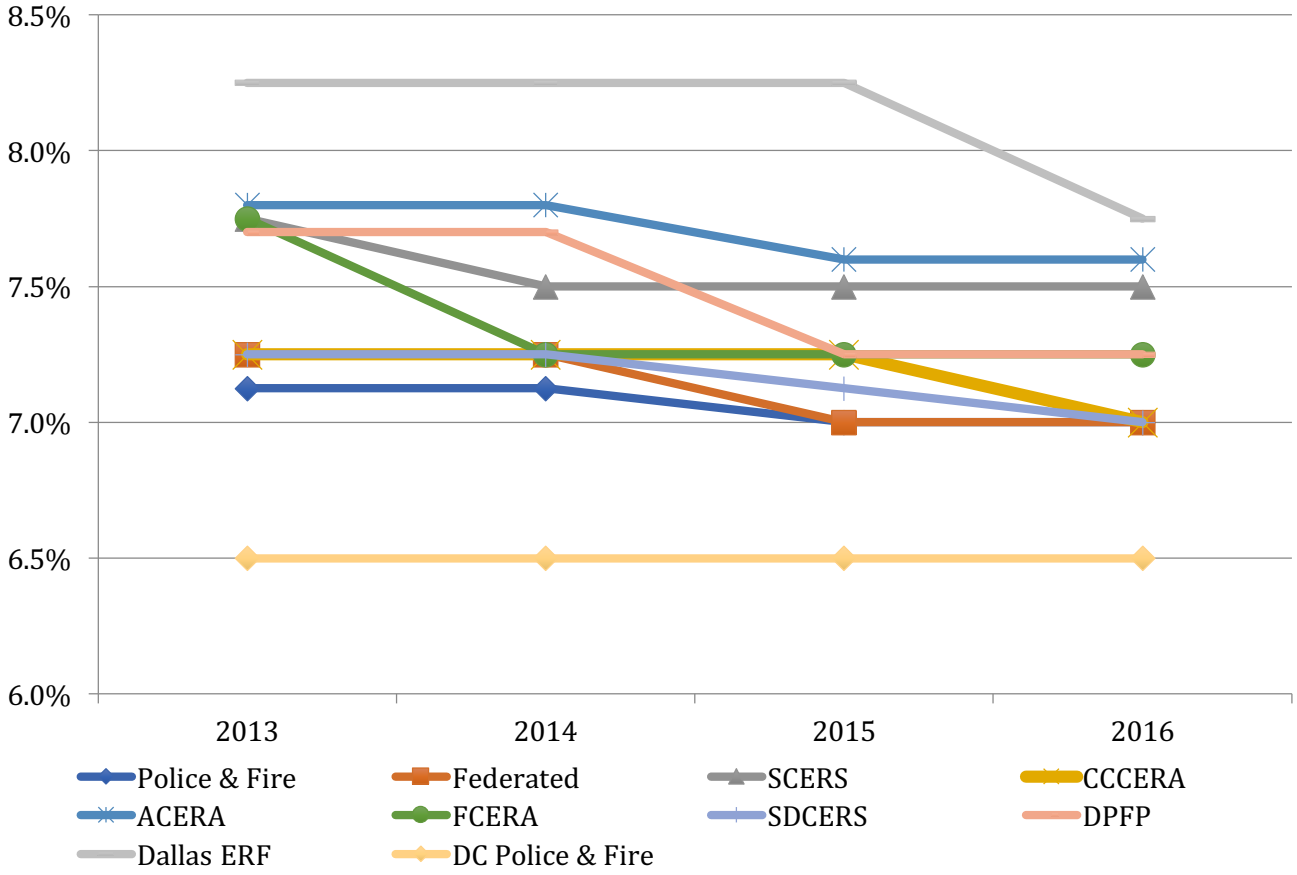
---

[4] It should be noted that certain funds held in the San Jose plans' Public Equity and Fixed Income allocations are sponsored by hedge fund managers and may be considered hedge fund strategies.

[5] Retiree concerns about the sustainability of the DPFP led to substantial redemptions which led to a December 2016 suspension of redemptions. See Hallman, T., "Dallas Police

The actual investment program should earn returns at least equal the actuarially determined discount rate (which itself is based on expected returns on plan assets). Figure 5 illustrates the discount rate for each plan in the peer group over the last four years.

Figure 5 – Discount Rates Assumed in Calculation of Pension Liabilities (2013-2016)



Source: Comprehensive Annual Financial Reports.

What is immediately evident from Figure 5 is the downward trend in discount rates across all plans except for DC Police & Fire. The San Jose plans both use a discount rate of 7% as of FY 2016. This leads to the question of whether the actual portfolios selected by investment staff will generate future returns equal to these discount rates. Table 4 illustrates portfolio returns for the year ended March 31, 2017 as well as hypothetical returns for that period under various scenarios:

- Hypothetical actual asset class returns weighted for the target asset allocation;

---

and Fire Pension Board ends run on the bank, stops $154mm in withdrawals," Dallas Morning News, December 8, 2016, https://www.dallasnews.com/news/dallas-city-hall/2016/12/08/dallas-police-fire-pension-board-ends-run-bank-stops-154m-withdrawals.

- Hypothetical benchmark returns weighted for the actual asset class allocation (note that certain of the benchmarks are based on indices that are not investable);
- Hypothetical benchmark returns weighted for the target asset allocation; and
- Projected portfolio returns[6] using independent projections for each asset class.

In the case of the Police & Fire plan, the portfolio underperformed the benchmark by 30 basis points due to asset class weighting – 8.5% to 8.8%. In the case of the Federated plan, the portfolio lagged the benchmark by 170 basis points due to divergence from both the asset allocation and security selection (i.e. active management compared with index allocations) – 7.3% to 9.0%.

[6] Projected returns are based on outlook per BlackRock Investment Institute (https://www.blackrock.com/institutions/en-us/insights/portfolio-design/capital-market-assumptions) and long-term equilibrium returns based on a geometric mean (time-weighted) calculation, as of November 13, 2017.

Table 4 – San Jose Plans – Returns Under Various Scenarios (YE March 31, 2017)

		Allocations				Returns				
		Police & Fire		Federated		Police & Fire		Federated		Outlook
Asset class	**Benchmark**	**Target**	**Actual**	**Target**	**Actual**	**Target**	**Actual**	**Target**	**Actual**	
Global equity	MSCI ACWI IMI, Net	31%	31%	28%	31%	15.4%	14.7%	15.4%	12.7%	6.0%
Private equity	Cambridge Associated PE Index Lagged one-quarter (and other benchmarks, including MSCI AWCI IMI Public Market Equivalent + 300 bps)	8%	8%	9%	3%	9.7%	11.1%	10.4%	3.6%	6.8%
Global fixed income	Diversified index	16%	16%	19%	20%	0.2%	7.1%	0.3%	2.6%	3.5%
Private debt	S&P Global Leveraged Loans + 2%	11%	7%	5%	4%	9.3%	7.4%	10.8%	2.1%	5.3%
Absolute return	HFRI All Macro Index	6%	8%	11%	14%	0.7%	0.7%	-0.6%	1.3%	3.4%
GTAA / opportunistic	60% MSCI World / 40% Citi WGBI	10%	9%	5%	0%	7.1%	7.3%	8.2%	0.0%	3.4%
Real Estate	NCREIF Property Index	7%	7%	7%	6%	8.1%	7.3%	7.3%	11.0%	4.1%
Commodities	Bloomberg Commodities Index	7%	6%	6%	6%	-9.5%	2.1%	8.7%	2.8%	3.2%
Infrastructure	DJ Brookfield Global Infrastructure Index	3%	2%	5%	5%	11.9%	0.0%	11.9%	11.5%	7.0%
Natural Resources	S&P Global Natural Resources Index	0%	0%	5%	6%	0.0%	0.0%	24.6%	23.1%	3.2%
Cash	91-day T Bills	1%	5%	0%	6%	0.4%	0.4%	0.0%	0.0%	2.0%

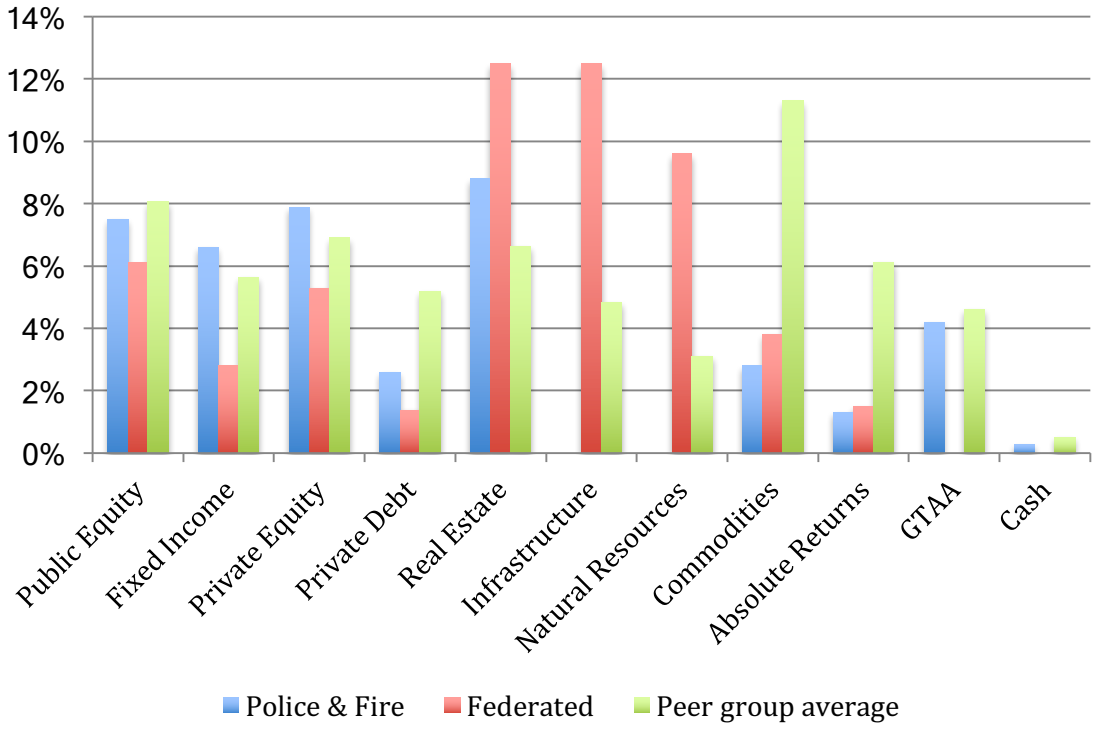
Actual portfolio returns	8.5%	7.3%
Hypothetical returns (target allocations, actual portfolio)	**8.8%**	7.3%
Hypothetical returns (actual allocations, benchmark portfolio)	7.2%	8.4%
Hypothetical returns (target allocations, benchmark portfolio)	7.6%	**9.0%**
Projected returns	4.8%	4.8%

Sources: Target asset allocations as per Investment Policy Statements of the Police and Fire Plan (1/5/17) and the Federated Plan (1/19/17). Actual asset allocations and benchmark returns as provided by investment consultant, as of March 31, 2017. Outlook is based on projected returns as per BlackRock Investment Institute (https://www.blackrock.com/institutions/en-us/insights/portfolio-design/capital-market-assumptions), long-term equilibrium returns based on a geometric mean (i.e. time-weighted) calculation, as of November 13, 2017 (public equities, fixed income, credit aggregated from sub-asset class projections, real estate data is for core, natural resources based on commodities).

Figure 6 illustrates the asset class returns for the San Jose plans relative to the performance of the peer group within each asset class. The Federated plan underperformed the peer group in all asset classes except for real estate, infrastructure, and natural resources during calendar 2016. The Police & Fire plan underperformed in all asset classes except for fixed income, private equity and real estate[7].

[7] Although the Federated plan outperformed the peer group in real estate, it should be noted that its allocation was lower. Similarly, the Police & Fire plan outperformed its peers

Figure 6 – Asset Class Returns of San Jose Plans Compared with Peer Group



Source: Investment consultant reports and investment reports for year ended December 31, 2016. Note: this comparison must be evaluated with a number of caveats, notably (i) certain asset classes were consolidated or reclassified to ensure consistency across plans, (ii) certain plans report high yield distinctly from fixed income, (iii) only two other plans (FCERA and ACERA) have allocations to commodities, (iv) only one other plan (DPFP) has an allocation to GTAA.

Sensitivity Analysis on Funded Status

Returning to Table 4, we observe that projected returns for the two plans are each approximately 4.8%, based on the projected returns[8] for the various constituent asset classes and target asset allocation.[9] This is meaningfully below the 7% discount rate illustrated in Figure 5.

The trend of decreasing discount rates illustrated in Figure 5 is attributable to pension plans adjusting their projected returns downwards. The potential impact on funded status from a lower discount rate is significant. Table 5 illustrates the impact on the San Jose plans of a 100 basis point decrease in the discount rate, i.e. to 6%. As at June 30, 2016, this would increase the aggregate net present value of future pension liabilities of the two plans by $1.15 billion.

---

in fixed income, private equity, and real estate but was underweighted relative to peers. The outperformance may have been driven by allocation, selection or timing.

[8] Actual and benchmark projected returns are weighted by actual and target allocations.

[9] Please see the assumptions underlying projected returns in the source notes to Table 4.

Table 5 – Sensitivity of Plan Net Position to Discount Rate

	Police & Fire		Federated	
Discount rate assumption	6%	7%	6%	7%
	$mm	$mm	$mm	$mm
Total pension liability	4,849	4,220	4,213	3,693
Fiduciary net position	3,044	3,044	1,859	1,859
Net pension liability	1,805	1,176	2,354	1,834
Funded status	62.8%	72.1%	44.1%	50.3%

Source: Comprehensive Annual Financial Reports of the plans.

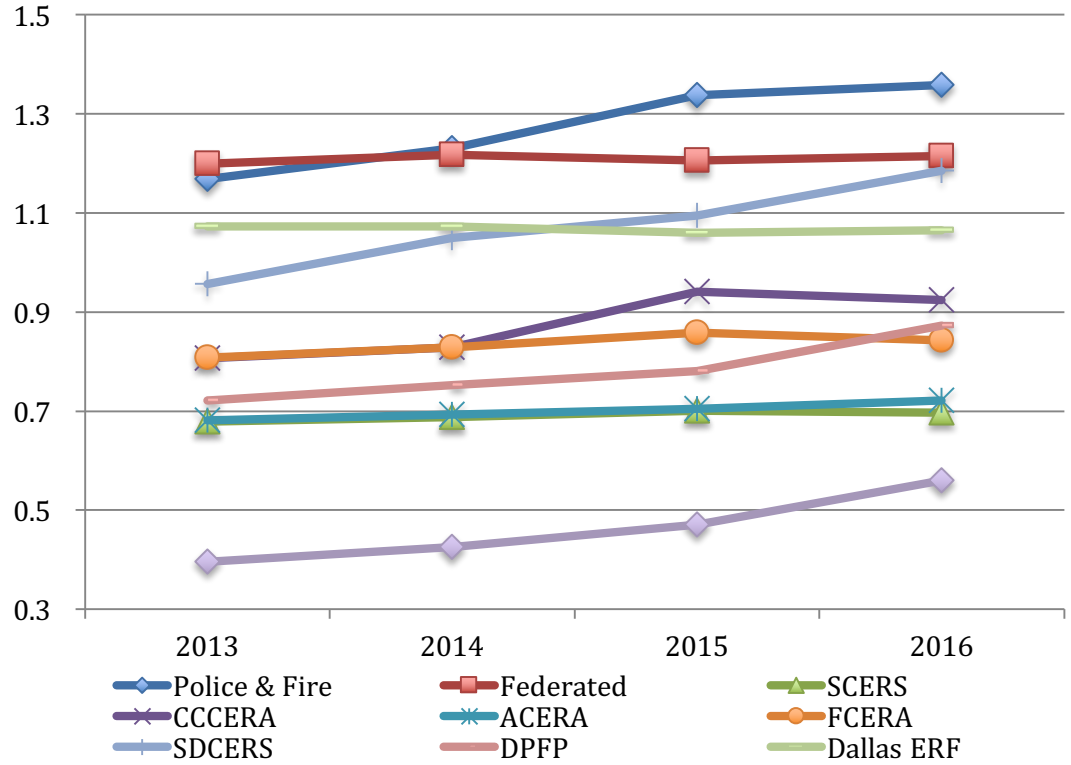
Changes in Net Plan Assets and the Impact of Demographics

We now turn to the annual contributions by members and their employers, and benefits paid to retirees and their beneficiaries. The demographics of the membership of the plans, specifically – the ratio between annuitants (who draw cash out of a plan) and active members (who fund cash into a plan) have a significant impact on cash flows.[10] Like most U.S. public plans, although to a greater degree than the peer group, the San Jose plans are mature, with growth in annuitants exceeding growth in new members. Figure 7 illustrates the ratio of annuitants to active members of the peer group.

This point is further highlighted in Figure 8, which shows the cumulative change in the number of annuitants and active members of plans in the peer group from 2006-2016.

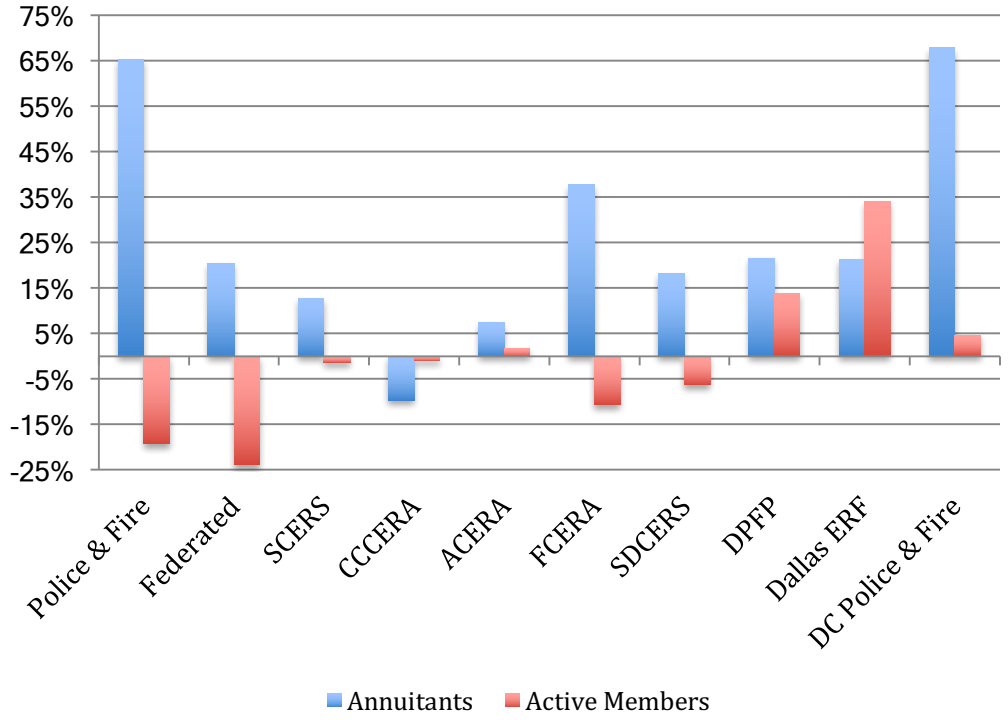
[10] This is similar to the dependency ratio that is commonly cited in economic and sociological studies.

Figure 7 – Ratio of Annuitants to Active Members of Peer Group (2013-2016)



Source: Comprehensive Annual Financial Reports.

Figure 8 – Change in Annuitants and Active Members of Peer Group (2006-2016)



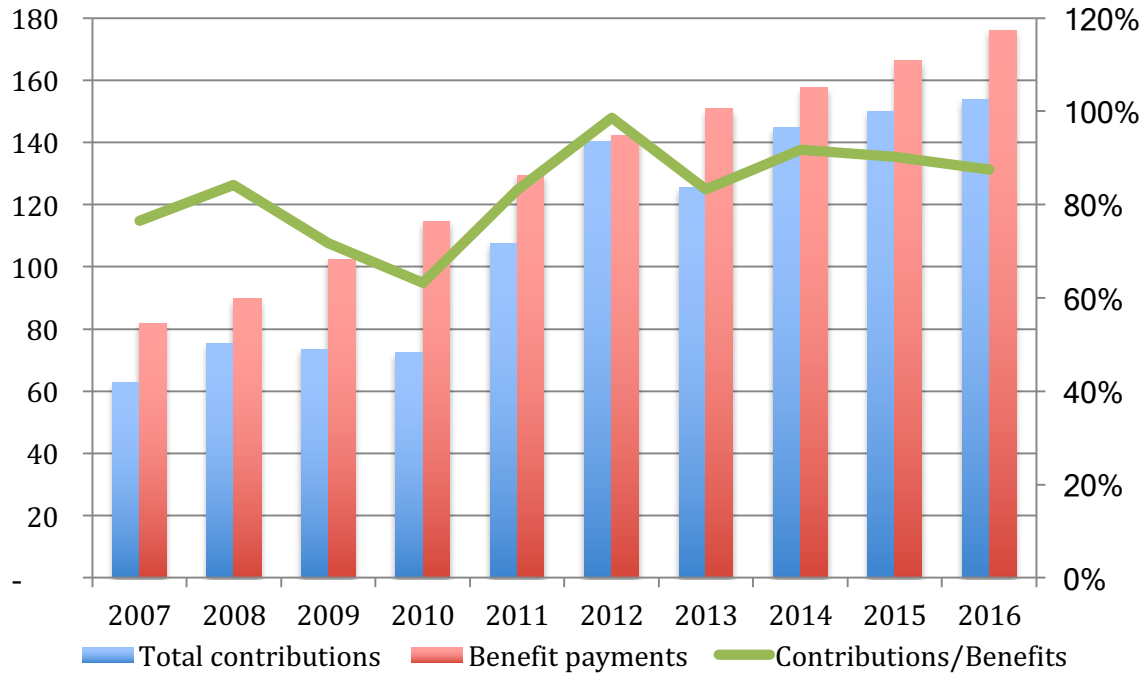
Source: Comprehensive Annual Financial Reports.

The San Jose plans are again outliers in that they have among the highest increase in retirees and the largest decrease in the number of members actively making contributions.[11]

Over time, the investment program should earn sufficient cash flows from yield (interest income and dividends) and realized gains on investments to fund the excess of benefit payments over contributions; otherwise, it would have to fund such excess payments from cash holdings.[12] Figures 9, 10, and 11 illustrate contributions and benefit payments for the San Jose plans and the percentage of benefits that is covered by contributions, at least in the short term.

Figure 11 shows employer and employee contributions and annual shortfall of contributions relative to benefits paid. As noted above, this shortfall must be made up for by realized investment gains, yield, or cash holdings in the near term.[13]

Figure 9 – Benefit Payments and Contributions ($mm) – Police & Fire (2007-2016)



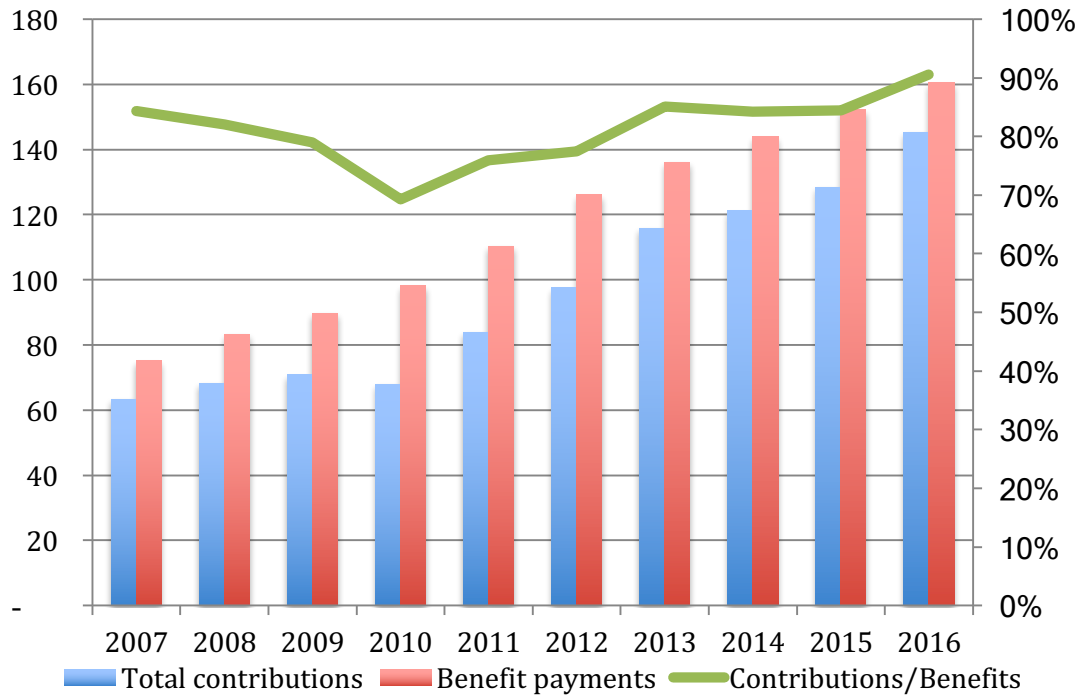
Source: Comprehensive Annual Financial Reports.

[11] The decrease in active members was likely related to the overall economic crisis in 2008-2010, as well as general city budget challenges.

[12] This observation ignores less significant line items, including expenses, death benefits, and refunds.

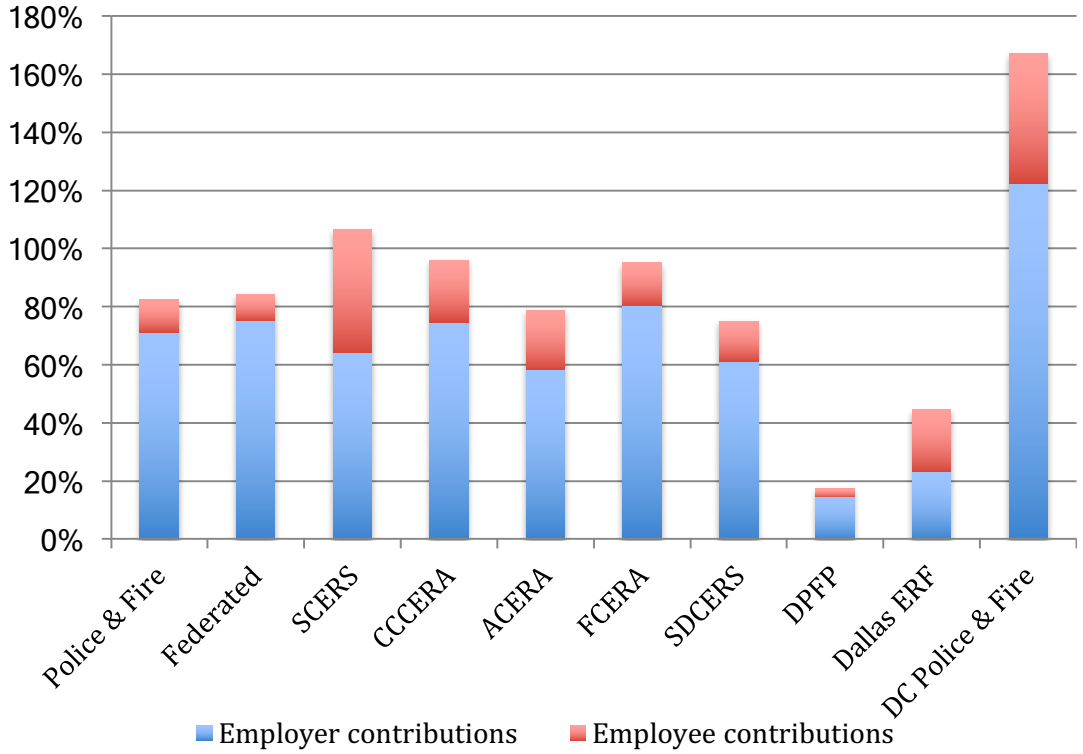
[13] As noted earlier, high DPFP plan outlays were likely caused by substantial withdrawals by retirees.

Figure 10 – Benefit Payments and Contributions ($mm) – Federated (2007-2016)



Source: Comprehensive Annual Financial Reports.

Figure 11 – Contributions and Shortfall as Percentage of Benefits (2016)



Source: Comprehensive Annual Financial Reports.

Evaluating Investment Performance

Next, we consider portfolio relative performance. As is evident in Table 6, the San Jose plans are among the weakest performing of the peer group.

Table 6 – Portfolio Performance of Peer Group (through December 31, 2016)

	1-year		3-years		5-years		10-years
Dallas ERF	9.17%	CCCERA	5.50%	ACERA	9.32%	ACERA	5.50%
SCERS	8.45%	SDCERS	4.90%	CCCERA	9.10%	CCCERA	5.40%
SDCERS	8.30%	SCERS	4.56%	SDCERS	9.00%	SDCERS	5.40%
DC Police & Fire	7.50%	Dallas ERF	4.55%	Dallas ERF	8.84%	FCERA	4.90%
ACERA	7.44%	ACERA	4.13%	SCERS	8.21%	DC Police & Fire	4.00%
CCCERA	6.90%	DC Police & Fire	3.10%	FCERA	7.20%	**Police & Fire**	**3.30%**
FCERA	6.60%	**Police & Fire**	**2.50%**	DC Police & Fire	7.00%	**Federated**	**3.30%**
Federated	**6.30%**	FCERA	2.50%	**Police & Fire**	**5.80%**	DPFP	1.40%
Police & Fire	**6.20%**	**Federated**	**2.40%**	**Federated**	**5.00%**		
DPFP	3.20%	DPFP	-2.10%	DPFP	1.60%		

Source: Investment consultant reports of investment reports of the plans as of December 31, 2016. Note: trailing 10-year returns for Seattle and Dallas Employees not available.

Table 7 shows the plans' investment rank relative to a universe of large ($1bn+) public plans.[14] On this basis, the plans are among the weakest performers in this larger peer group at the fifth percentile or lower.

Table 7 – Portfolio Performance of San Jose Plans (through March 31, 2017)

	1-yr	3-yrs	5-yrs	10-yrs
Median for plans with $1bn+ of net assets	11.6%	5.0%	7.4%	4.9%
Police & Fire				
Actual	8.5%	2.9%	5.2%	3.4%
Policy benchmark	8.7%	2.9%	5.2%	3.8%
Percentile	3%	3%	5%	4%
Federated				
Actual	7.3%	2.5%	4.2%	3.4%
Policy benchmark	8.3%	2.3%	5.1%	4.0%
Percentile	1%	1%	2%	4%

Source: Investment consultant reports, March 31, 2017. Note: Percentile reflects the ranking in the universe of pension plans in the InvestorForce Public Defined Benefit plan database for plans with more than $1bn in net plan assets.

[14] Investment consultant reports, March 31, 2017. Note that this analysis is for the period ending March 31, 2017, i.e. one quarter later than that illustrated in Table 6.

Table 8 provides some insight into portfolio performance relative to target returns. This table illustrates actual performance of each asset class for each of the two plans for the 1-, 3-, 5-, and 10-year periods ending March 31, 2017. It also reports the performance of the particular index (or group of indices) selected as the benchmark for these asset classes over the same periods. As an illustration, the Federated plan's private equity portfolio generated actual annualized returns, net of fees, of 7.2% over the ten-year period ending March 31, 2017. Over that same, the plan's benchmark (the Cambridge Associates Global Private Equity Index) reported annualized gains of 8.5%, implying an annualized underperformance for the Federated plan of 130 basis points of actual allocations relative to benchmark.

The variance between actual and benchmark returns reflects, to some degree, the impact of active portfolio management. Investable indices exist for certain of the asset classes (for example, equities), in the case of other asset classes, the benchmark indices are not readily investable, i.e. it is not possible to mimic the return stream of the underlying benchmark.

Table 8 – Performance Relative to Benchmarks of San Jose Plans (through March 31, 2017)

	Police & Fire				Federated			
	1-yr	3-yrs	5-yrs	10-yrs	1-yr	3-yrs	5-yrs	10-yrs
Equity	14.7%	5.2%	8.3%		12.7%	4.5%	8.2%	
Custom benchmark	15.4%	5.1%	8.6%		15.4%	5.1%	8.5%	
Excess return	-0.7%	0.1%	-0.3%		-2.7%	-0.6%	-0.3%	
Private equity	11.1%	9.1%	11.8%	9.8%	3.6%	7.7%	10.3%	7.2%
Custom benchmark	9.7%	7.2%			10.4%	7.6%	10.4%	8.5%
Excess return	1.4%	1.9%			-6.8%	0.1%	-0.1%	-1.3%
Fixed income	7.1%	2.7%	4.5%	6.0%	2.6%	1.3%	2.2%	
Custom benchmark	0.2%	0.5%	2.3%	5.0%	0.3%	0.5%	0.9%	
Excess return	6.9%	2.2%	2.2%	1.0%	2.3%	0.8%	1.3%	
Private debt	7.4%				2.1%	4.3%	6.5%	
Custom benchmark	9.3%				10.8%	4.3%	6.3%	
Excess return	-1.9%				-8.7%	0.0%	0.2%	
Real estate	7.3%	9.2%	10.0%	6.5%	11.0%	16.0%	14.1%	4.9%
Custom benchmark	8.1%	7.6%			7.3%	10.6%	10.7%	6.7%
Excess return	-0.8%	1.6%			3.7%	5.4%	3.4%	-1.8%
Infrastructure					11.5%	5.1%		
Custom benchmark					11.9%	4.7%		
Excess return					-0.4%	0.4%		
Commodities	2.1%	-9.8%	-7.3%		2.8%	-12.3%	-8.8%	
Custom benchmark	9.1%	-9.5%	-6.3%		8.7%	-13.9%	-9.5%	
Excess return	-7.0%	-0.3%	-1.0%		-5.9%	1.6%	0.7%	
Absolute return	0.7%	1.8%			1.3%	2.8%		
Custom benchmark	-0.5%	0.9%			-0.6%	1.8%		
Excess return	1.2%	0.9%			1.9%	1.0%		
GTAA	7.3%	1.2%			0.0%			
Custom benchmark	7.1%	2.9%			8.2%			
Excess return	0.2%	-1.7%			-8.2%			
Natural resources					23.1%	-4.4%		
Custom benchmark					24.6%	-2.2%		
Excess return					-1.5%	-2.2%		

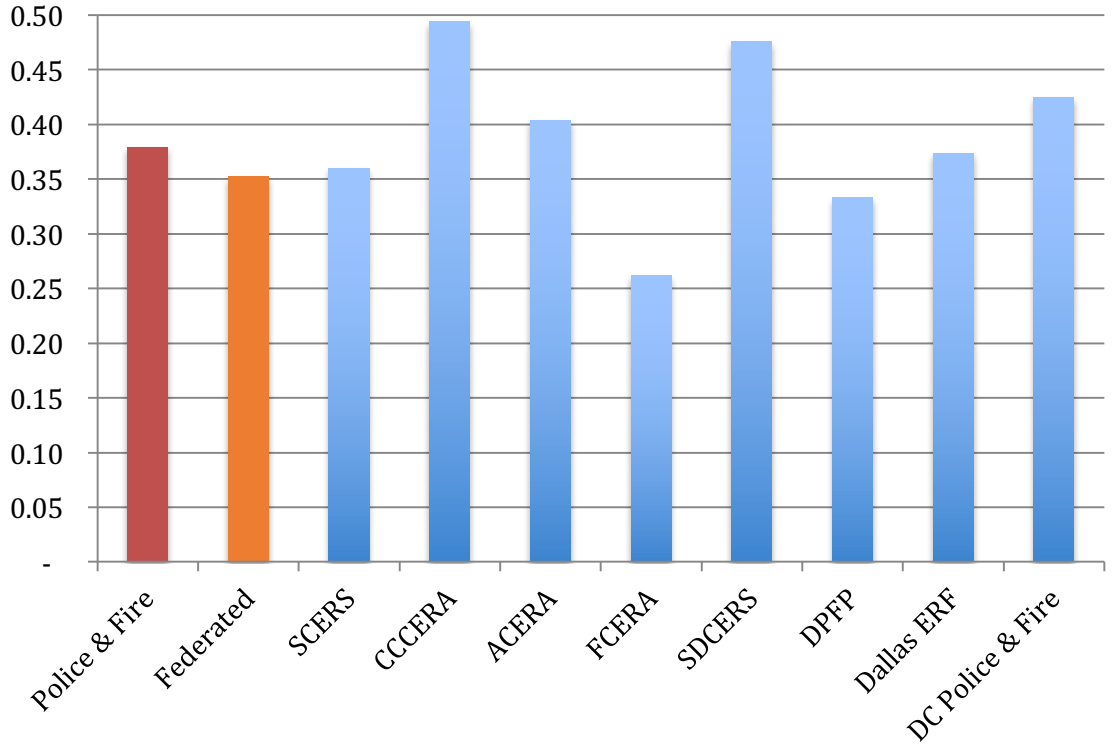
Source: Investment consultant reports, March 31, 2017

Risk-Adjusted Returns

We now evaluate the performance of the San Jose plans on a risk-adjusted basis versus that of the peer group. In the context of portfolio management, the most basic metric to measure risk is volatility, calculated as standard deviation of returns. A commonly used metric that combines risk and return in a single statistic is the Sharpe Ratio, which is calculated as the ratio of excess returns above a risk-free rate, to volatility in returns, as measured by standard deviation.[15]

Figure 12 shows the Sharpe Ratio for each of the plans in the peer group. Per unit of risk, the San Jose plans are in the middle of the range relative to the peer group. Their returns are below those of the other plans and their risk is also somewhat below those of the mean of the peer group.

Figure 12 – Sharpe Ratios of Peer Group (period ending FY 2016)



Source: Investment performance from Comprehensive Annual Financial Report for the period 2006-2016. Calculation uses annual observations. Risk-free rate is the 1-year Treasury, which was 1.3% at the time of writing. This data across plans is not directly comparable as the plans have different fiscal years and hence different reporting periods.

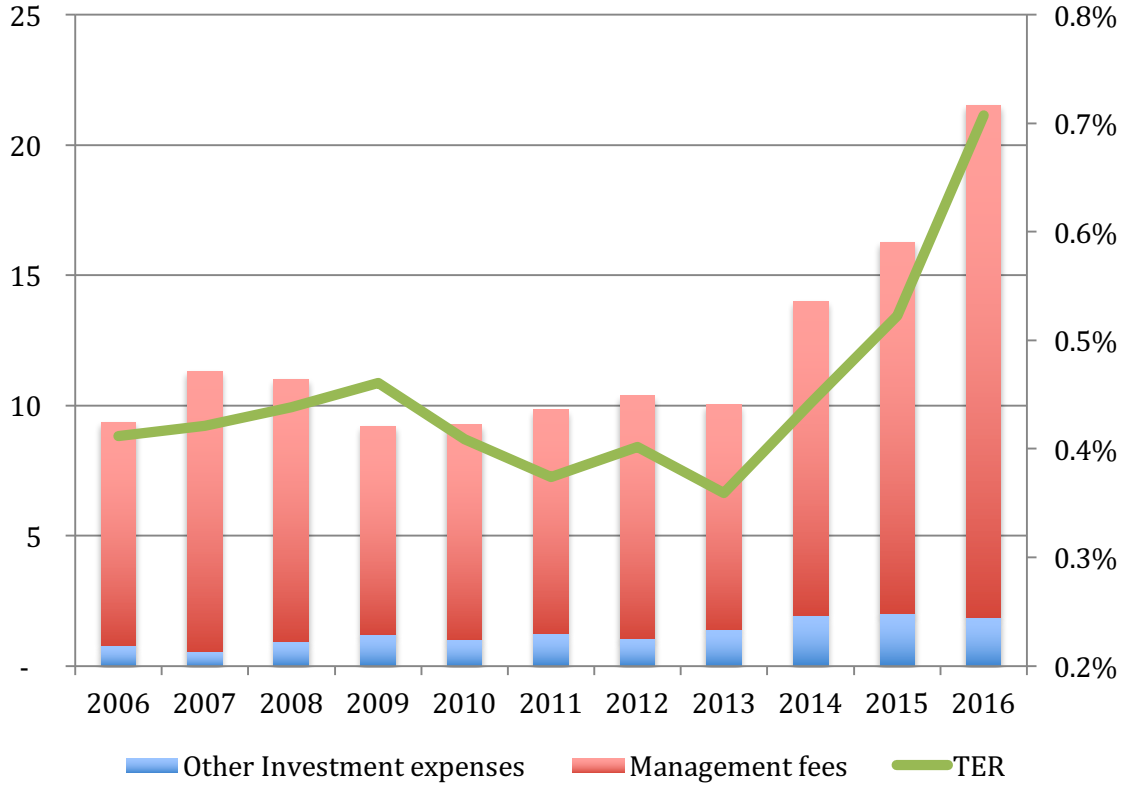
[15] Accordingly, a higher the Sharpe Ratio means better quality returns. A few caveats to the use of the Sharpe Ratio are worth noting. It does not distinguish between upside and downside volatility. The Sortino Ratio seeks to address this by only penalizing downside volatility; it is less prevalent and hence we have used the Sharpe Ratio in this document. Additionally, the Sharpe Ratio assumes a normal distribution of returns, which is not necessarily observed in return data over all time series.

Investment Expenses

One final factor that impacts net plan position and returns is the expense load for managing portfolios. This includes internal costs (primarily, investment staff compensation and related expenses) and external costs (fees paid to external investment managers and administrative expenses). Before we explore the impact of fees, we note that a high expense load is not necessarily a negative indication. After-fee returns are much more important than the expense of achieving those returns.

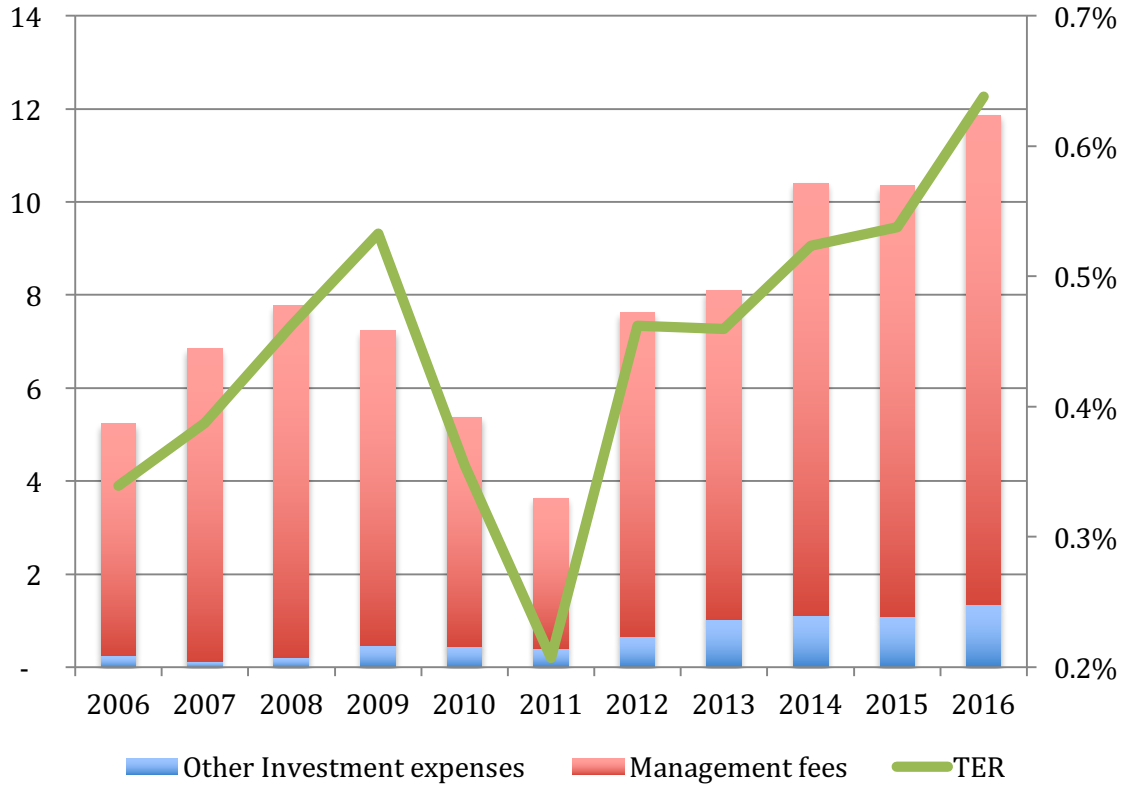
Figures 13 and 14 show that total investment expenses of the San Jose plans have increased over the past three years on both an absolute basis and as a percentage of net plan assets. This is partly attributable to a change in the asset allocation towards more alternative investment products, which incur higher fees (including performance fees) than equity and fixed income strategies. Interestingly, both San Jose plans underperformed the peer group in the absolute returns asset class (Figure 6), one in which they had higher relative allocations (Figure 4).

Figure 13 – Police & Fire Plan - Investment Expenses ($mm, 2006-2016)



Source: Comprehensive Annual Financial Reports. Note: TER refers to the Total Expense Ratio, the ratio of expenses to market value of assets.

Figure 14 – Federated Plan - Investment Expenses (($mm, 2006-2016)



Source: Comprehensive Annual Financial Reports. Note: TER refers to the total expense ratio, the ratio of expenses to market value of assets.

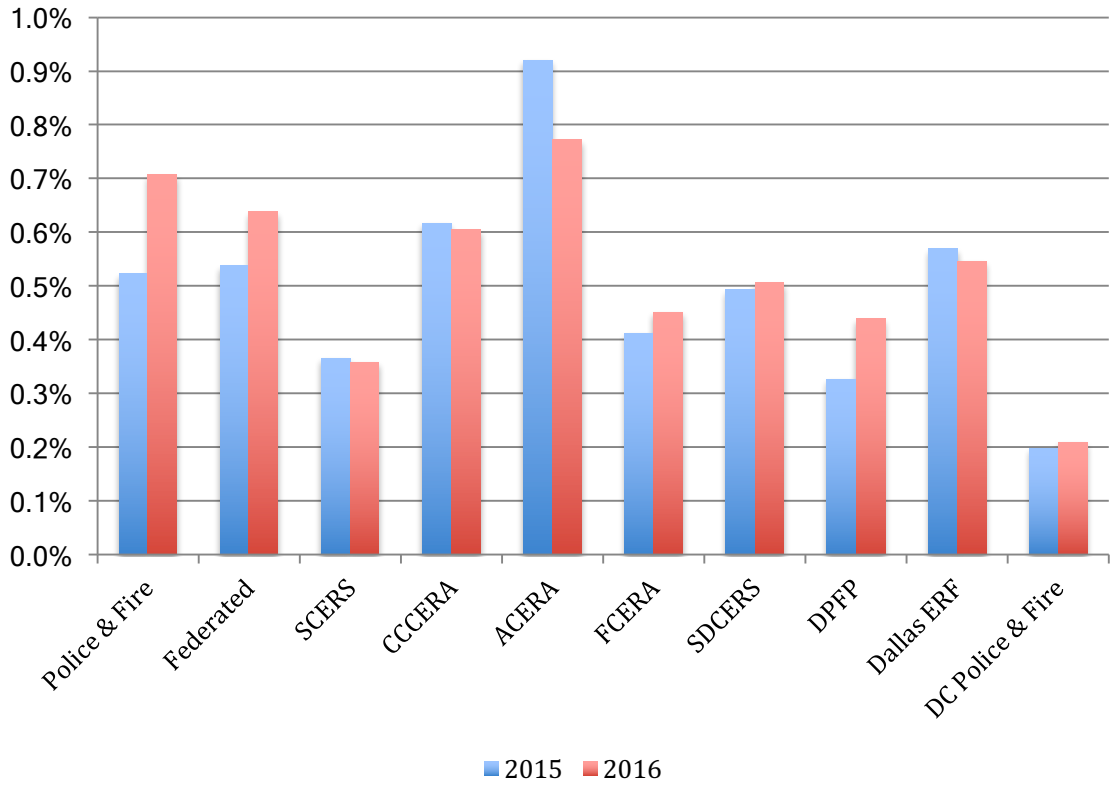
On a relative basis, the San Jose plans are among the more expensively managed of the peer group, as can be seen in Table 9 and Figure 15. As indicated, the TER in 2016 for the San Jose plans exceeded all other plans except ACERA. In 2015, San Jose TERs exceeded those in five of the eight peer group plans.

Table 9 – Management Fee and Total Expense Ratio of Peer Group

	Year End	Market Value of Assets	Mgmt Fee	Expense Ratio	Total Expenses	Total Expense Ratio
		$mm	$mm		$mm	
Police & Fire	Jun-16	3,044	19.65	0.65%	21.52	0.71%
Federated	Jun-16	1,859	10.52	0.57%	11.86	0.64%
SCERS	Dec-15	2,313	9.10	0.39%	9.75	0.42%
CCCERA	Dec-16	7,439	43.66	0.59%	45.03	0.61%
ACERA	Dec-16	6,133	40.90	0.67%	47.36	0.77%
FCERA	Jun-16	4,009	16.91	0.42%	18.07	0.45%
SDCERS	Jun-16	6,388	29.51	0.46%	32.36	0.51%
DPFP	Dec-16	2,680	6.95	0.26%	11.78	0.44%
Dallas ERF	Dec-16	3,328	14.93	0.45%	18.19	0.55%
DC Police & Fire	Sep-16	4,954	11.81	0.24%	14.15	0.29%

Source: Comprehensive Annual Financial Reports. Note: Seattle had not published its 2016 CAFR as of the date of writing, as such fiscal 2015 data is used for that plan.

Figure 15 – Total Expense Ratios of Peer Group (2015 and 2016)



Source: Comprehensive Annual Financial Reports.

With respect to internal expenses and staff count, the San Jose plans are also outliers, with total investment staff of ten. Most other plans report investment staff of one or two (SCERS reports four staff).[16]

Conclusions

Using a financial statement approach, looking at assets, liabilities, and cash flows, we have illustrated challenges facing the San Jose public pension plans. We have noted that these plans have suffered from a deterioration in their funded status (see Figure 1) attributable to (i) demographic factors such as a maturing and shrinking workforce (see Figure 7), (ii) relatively weak investment performance compared with a peer group (see Table 6 for an cross-sectional view, Table 7 for a ranking against all large plans, and Figure 6 for an asset class view), and (iii) relatively high investment expenses (see Table 9 and Figure 16) that act as a drag on performance. Like many U.S. public pension plans, the San Jose plans face a shortfall of contributions relative to benefit payments (see Figures 9-10 for a time series view and Figure 11 for a cross-sectional view), making them particularly sensitive to weaker investment performance and, especially, to the current income (yield) component of the investment program which is necessary to pay excess benefit payments.

The San Jose plans have correctly increased their allocations to longer-duration investments to match the long duration of their liabilities (see Figure 3). That said, it is questionable whether the allocations to alternative asset classes have been done in the most optimal way. This is true from the perspective of asset allocation and portfolio composition (Figure 6 provides a cross-sectional illustration of asset class-level performance for the peer group).

The observation regarding recent investment performance, net of investment expenses, is important because subpar performance affects pension plans in two ways: it reduces the potential growth in assets and, if it is expected to reduce projected performance, could require a downward adjustment to the discount rate as has been occurring in recent years (see Figure 5), which has a direct impact on liabilities (see Table 5). Reduced growth in net plan assets and increased present value of liabilities both expand the funding gap, and as such, the investment strategy and management should be a particular focus of the plan fiduciaries.

[16] This staffing data refers to positions on the organization charts in each plan's CAFR; it does not necessarily imply that each position is currently filled. It is not possible to quantify the cost of this staff, as the plans do not report aggregate compensation data.