

**TUCSON SUPPLEMENTAL RETIREMENT SYSTEM
BOARD OF TRUSTEES
Notice of Regular Meeting / Agenda**

DATE: Thursday, July 30th, 2015
TIME: 8:30 a.m.
PLACE: Finance Department Conference Room, 5th floor
City Hall, 255 West Alameda
Tucson, Arizona 85701

A. Consent Agenda

1. Welcome Jorge Hernandez, new TSRS Board member
2. Approval of June 25, 2015 TSRS Board Meeting Minutes
3. Retirement ratifications - July 2015
4. June 2015 TSRS expenses compared to budget

B. Administrative Discussions

1. Determination Letter Renewal / Discussion of Proposed TSRS Code Changes – Cassie Langford
2. Discussion of Open and Closed Amortization, comparison to TSRS Funding / Amortization Policy (Gabriel, Roeder, Smith & Company – July 14, 2015)
3. Discussion of Topics and possible guest attendees for the October 30th TSRS Board Retreat (Copy of October 2014 Agenda attached)

C. Investment Activity Report

1. Update on Transition Manager Activity
2. TSRS Portfolio composition, transactions and performance review for 06/30/15

D. Articles for Board Member Education / Discussion

1. Still a Better Bang for the Buck (National Institute on Retirement Security, December 2014)
2. Does the Social Security “Statement” Add Value? (Center for Retirement Research at Boston College, July 2015)
3. Trust Fund Reserve Gains One Year for Projected Depletion Date (Social Security Matters, July 23, 2015)
4. Transition Management – Beyond the Basics (Callan Investments Institute July 2013)

E. Call to Audience

F. Future Agenda Items

G. Adjournment

Please Note: Legal Action may be taken on any agenda item

*Pursuant to ARS 38-431.03(A)(3) and (4): the board may hold an executive session for the purposes of obtaining legal advice from an attorney or attorneys for the Board or to consider its position and instruct its attorney(s) in pending or contemplated litigation. The board may also hold an executive session pursuant to A.R.S. 38-431.03(A)(2) for purposes of discussion or consideration of records, information or testimony exempt by law from public inspection.



Office of the City Clerk
BOARDS, COMMITTEES, COMMISSIONS
Tucson Supplemental Retirement System Board of Trustees (TSRS)

<u>Appointor (Classification)</u>	<u>Member</u>	<u>Appointment</u>	<u>Expiration</u>
<None> (Finance Director)	Silvia Amparano City of Tucson/Finance Department 255 W. Alameda Tucson, AZ 85701 Work Phone: 837-4444 Silvia.Amparano@tucsonaz.gov	8/11/2013	
<None> (Human Resources Director)	Curry Hale City of Tucson/Human Resources Director 255 W. Alameda St. Tucson, AZ 85701 Work Phone: 837-4170 Curry.Hale@tucsonaz.gov	4/6/2014	
City Manager	Kevin Larson Sr. UNS Energy Corp., Mailstop HQE 901 88 E. Broadway Blvd. Tucson, AZ 85701 Home Phone: 884-3660 klarson@tep.com	1/3/2015	
Elected (Employee Representative)	Michael Coffey COT Water 310 W. Alameda St. Tucson, AZ 85701 Work Phone: 837-2108 Michael.Coffey@tucsonaz.gov	1/3/2015	1/2/2018
* Elected (Employee Representative)	Jorge Hernandez Housing & Community Development 310 N. Commerce Park Loop Tucson, AZ 85745 Work Phone: 837-5405 Jorge.Hernandez@tucsonaz.gov	7/30/2015	1/31/2017
Elected (Retiree Representative)	John O'Hare 3865 N. Tucson Blvd. Tucson, AZ 85716 Home Phone: 883-2308	1/1/2015	12/31/2017
Mayor and Council	Robert Fleming Chairman 330 N. Granada Ave. Tucson, AZ 85701 Work Phone: 622-0400 fleming@flemingandcurti.com	11/7/2012	11/6/2016

TUCSON SUPPLEMENTAL RETIREMENT SYSTEM BOARD OF TRUSTEES

Meeting minutes from Thursday, June 25, 2015

Members Present: Robert Fleming, Chairman
Curry Hale, HR Director
Silvia Amparano, Director of Finance
Michael Coffey, Elected Representative
John O'Hare, Elected Retiree Representative

Staff Present: Chris Avery, City Attorney's Office
Silvia Navarro, Treasury Administrator
Allan Bentkowski, Treasury Finance Manager
Michael Hermanson, Plan Administrator
Dennis Woodrich, Lead Pension Analyst
Dawn Davis, Administrative Assistant

Guests Present: Jorge Hernández, City of Tucson Employee
Tami Norman, City of Tucson Employee
Randal Norman, Spouse of Tami Norman
Heather Manriquez, Daughter of Tami Norman

Absent/Excused: Kevin Larson, City Manager Appointee

Call to order- Chairman Fleming called the meeting to order at 8:30 AM.

A. Consent Agenda

1. Approval of May 28, 2015 TSRS Board Meeting Minutes
2. Retirement ratifications for June 2015
3. May 2015 TSRS expenses compared to budget
4. Adoption of TSRS Investment Policy Statement dated June 25, 2015
 - a. Investment Policy and Objectives – DRAFT reviewed at May 28, 2015
 - b. Board member comments received by TSRS staff concerning Draft Investment Policies + staff responses
 - c. Investment Policy and Objectives – June 2015 FINAL version
5. Adoption of TSRS Governance Policies dated June 25, 2015

A motion to approve the Consent Agenda was made by Silvia Amparano, 2nd by Curry Hale, and passed by a vote of 4 – 0 (Chairman Fleming did not vote).

B. Application For Disability Retirement – Tami Norman*

A motion to approve disability retirement for Tami Norman was made by John O'Hare, 2nd by Silvia Amparano.

A motion to go into executive session was made by Curry Hale, 2nd by Silvia Amparano, and passed by a vote of 4 – 0 (Chairman Fleming did not vote).

A motion to return to regular session was made by Silvia Amparano, 2nd by Curry Hale, and passed by a vote of 4 – 0 (Chairman Fleming did not vote).

Disability retirement for Tami Norman was approved by a vote of 3 – 1 (Michael Coffey dissenting, Chairman Fleming did not vote).

C. Administrative Discussions

1. Introduction of Candidates for Open Board Position
 - a. Jorge Hernandez
 - b. Jorge Riveros

Michael Hermanson introduced Jorge Hernández and advised the Board that Jorge Riveros declined to serve on the TSRS Board of Supervisors due to his inability to attend the meetings.

Chairman Fleming asked Mr. Hernández to tell the Board about himself.

Jorge Hernández has a bachelor's degree in economics, his interest in finance, markets, and economics has stayed with him over time and he believes serving on this Board would be a great opportunity to combine his background, experience, and interests to make a meaningful contribution to the City and his fellow employees: At a previous job he was one of 2 people who handled the employee savings program containing 401K and profit sharing components; he worked with the 3rd party administrators, accountants, and to a lesser extent the investment managers. He reviewed many of the application and eligibility requirements, the calculations for benefit and contribution amounts, discrimination test results, IRS annual return reports, and anything dealing with distributions. He worked with accounting on the annual compliance audit by pulling all the necessary documents and acting on any recommendations from the accountants for the trustees, and is also familiar with ERISA rules and regulations. Given the opportunity he looked forward to implementing that knowledge.

Michael Coffey asked what ALPFA was after reading about it in the information provided on Mr. Hernández for the previous Board election.

Mr. Hernández answered it was the Association of Latino Professionals in Finance and Accounting. It is a national organization with between 30,000 and 40,000 members nationwide and in Puerto Rico.

A motion to appoint Jorge Hernández to the TSRS Board of Supervisors was made by Curry Hale, 2nd by Silvia Amparano.

Mr. Hale stated Mr. Hernández attended the Board retreat on October 31, 2014, to learn what being a Board member entailed which showed a lot of initiative.

Mr. Hermanson advised Mr. Hernández that his current term would end December 2017.

The motion passed by a vote of 4 – 0 (Chairman Fleming did not vote).

2. Securities Litigation Engagement - Robbins Geller Rudman & Dowd

Michael Hermanson explained the last orders from the Board were to proceed with what he understood to be a limited engagement; beginning with this firm performing a free securities litigation audit, then provide the Board with any results, then the Board could decide whether they wanted to continue or terminate the engagement. Understanding the Board's stated limitations, the City Attorney's Office (CAO), rewrote the engagement letter provided by Robbins Geller to indicate the limitations, but the firm would not accept any changes to their engagement letter. As a result, Mr. Deibel indicated there should be further clarification with the Board before proceeding.

Michael Coffey asked for clarification on the difference between the engagement letters.

Mr. Hermanson said the CAO specified the engagement would only be for the initial audit of foregone litigation opportunities and the resulting report. The firm wants to use their standard engagement letter which includes starting the engagement with an audit and proceeds with continuous monitoring and monthly reports. It would be a free service, lasting until the Board terminated the engagement, which could be done at any time.

Chris Avery said the decision about whether to engage in any litigation had to be made by the Mayor and Council. The decision about who to hire to proceed with any approved litigation had to be made by the CAO. The general philosophy of the CAO is that they do not actively search for litigation.

Chairman Fleming clarified that litigation was not included in the engagement letter.

Mr. Hermanson answered that would be a separate decision, the Board would be informed there was a litigation opportunity missed by BNY Mellon, who currently registers the City of Tucson for any appropriate class action lawsuits.

Mr. Coffey asked what the potential upside was for engaging with this firm.

Mr. Hermanson answered the potential upside was they would find that BNY Mellon had missed litigation opportunities, and that the Board has an opportunity to pursue litigation and utilize their services.

Chairman Fleming said they would sign the agreement and the law firm would tell them 1 of 3 things: BNY Mellon has done well and there were no missed litigation opportunities, there are some missed lawsuits and the Board needs to fill out a form to collect the money, or they think there was a case they could litigate for the Board. He did not believe there was any need to be anxious about hiring a litigator because they were not near that point by signing the agreement as presented.

John O'Hare said there was a 4th option where if the firm found a litigation opportunity the Board could request the CAO perform a request for proposal (RFP).

Mr. Avery advised that the CAO did not generally perform RFPs for litigation. Robbins, Geller, Rudman & Dowd were trying to put their firm in a position where, by default, they would become the attorneys the CAO would choose to perform the litigations.

Mr. Hermanson said the idea was to bring the engagement letter back and confirm whether the Board wanted to proceed with the agreement.

Mr. O'Hare suggested the Board terminate the engagement once the initial audit report is received and discuss what to do if any missed litigation opportunities are found.

Silvia Amparano clarified the Board would only make a recommendation that the CAO enter into an agreement with this firm.

Mr. Avery answered the CAO decides what counsel will be hired.

Chairman Fleming did not believe they were discussing hiring counsel because they would be hired as consultants not attorneys. The Board might have a fiduciary duty to hire them because there was a realistic possibility there was significant money available with zero risk to obtain more information about it.

Mr. Hermanson asked if the Board wanted to proceed with the engagement letter, after it is reviewed by the CAO.

Mr. Hale asked if the CAO was advising against proceeding with the engagement.

Mr. Avery answered the CAO was not advising against it, they were cautioning against actively seeking out litigation.

Mr. Coffey clarified that the issue the Board ought to be concerned with was whether there was money available that they were unaware of. **A motion to accept the unedited engagement letter provided by Robbins, Geller, Rudman & Dowd was made by Michael Coffey, 2nd by John O'Hare.**

Mr. Hale stated he understood the Board's fiduciary duty but they should make sure to have a full understanding of the issue if they will be going against the CAO recommendation.

Mr. Hermanson clarified that the CAO was trying to protect the interests stated by the Board at the meeting held on May 28, 2015, by limiting the engagement solely to the audit and the firm rejected those changes. The Board could proceed with no changes or decline the engagement altogether, they would not be going against the CAO either way.

Mr. Avery explained if the Board was not hiring the firm to be their attorney they did not need a legal firm and could issue an RFP for an accounting firm or securities consultant and not involve the CAO.

Chairman Fleming answered an offer where the service will be free could not be beaten by an RFP after incurring the loss of time, and administrative and Dollar costs associated with issuing an RFP.

Mr. Hermanson said if the Board reached a point where they might hire the firm, then they could request an RFP from the CAO.

The motion passed by a vote of 3 – 1 (Curry Hale dissenting, Chairman Fleming did not vote).

3. Progress Report on Reconfiguration of Quarterly Retiree Report

Michael Hermanson reported CGI (the City's payroll software vendor) had successfully recreated the quarterly statement to include the year to date pay amounts requested by CTRA a few months ago. The new quarterly statements will be mailed out with the CTRA newsletter in the next few days.

D. Investment Activity Report

1. Board Briefing of Transition Manager Interviews Scheduled for June 3, 2015

Allan Bentkowski reported the transition managers were interviewed June 3, 2015; and staff, along with Callan, had decided to hire Black Rock, Penserra, and Macquarie Capital as the three transition managers on call for future asset transitions. The agreements have been reviewed by treasury staff and the CAO, who advised to have outside council review them further. Catherine Langford, the Board's outside legal counsel will be reviewing the agreements should have get them back to staff by the end of June 2015. Once that is done, staff will ask these 3 managers to prepare a cost estimate for the upcoming transition and a finalist will be selected.

Chairman Fleming asked if staff would be bringing the selection of the Transition Manager back to the Board for a vote before making a final decision.

Mr. Bentkowski answered no.

Michael Coffey advised this was identified as one of the responsibilities of staff in the Investment Policy Statement approved on the consent agenda earlier today.

Michael Hermanson said the Board members could be present for the analysis if they chose to do so and a summary report would be provided to the Board after the decision was made.

Mr. Bentkowski stated the transaction will likely be completed before the next Board meeting on July 30, 2015.

2. TSRS Portfolio composition, transactions and performance review for 05/31/15

Allan Bentkowski reported as of 5/31/15 the total portfolio value was \$747.5M, on 4/30/15, it was \$746.3M, and \$750.1M as of 6/24/15. All managers remain within the target allocation ranges. During the month of May, 2015, \$3M was moved out of T. Rowe Price and \$1M out of Pyramis to fund monthly retirement payments.

Calendar YTD returns – For the month of May, the Total Fund returned 0.70% vs. the Custom Plan Index at 0.42%; Total Fixed returned -0.03% vs. the Barclays Aggregate at -0.24%; Total Equities returned 1.05% vs. Equity Composite at 0.82%; Total Real Estate returned 0.73%; Total Infrastructure returned -0.43% vs. the CPI +4% at 0.84%. Through 5/31/15, the calendar YTD return for the Total Fund was 4.0% vs. 3.54% for the Custom Plan Index.

Michael Coffey asked when the last time Total Infrastructure hit its target was.

Mr. Bentkowski answered Steel River was consistently hitting the benchmark. Macquarie has had a problem lately due to valuations on the infrastructure accounts; they operate in Euros which are converted to Dollars; so as the Dollar strengthens, it affects the valuation of that account. Callan advised that the internal rate of return for Macquarie is better than the internal rate of return for Steel River. They were hired to be bond like for the infrastructure accounts and the plan is receiving cash from them regularly.

Fiscal YTD returns – As of 5/31/15 the Total Fund returned 5.37% vs. the Custom Plan Index at 5.59%; Total Fixed returned 2.22% vs. the Barclays Aggregate at 2.97%; Total Equities returned 7.02% vs. the Equity Composite at 6.30%; Total Real Estate returned 10.04% vs. NCREIF at 10.22% (as of 3/31/15); and Total Infrastructure returned -5.93% vs. the CPI +4% at 3.43%.

Trailing One Year Returns – As of 5/31/15 the Total Fund returned 7.26% vs. the Custom Plan Index at 7.43%; Total Fixed returned 2.73% vs. Barclays Aggregate at 3.02%; Total Equities returned 9.26% vs. the Equity Composite at 8.77%; Total Real Estate returned 11.30% vs. the NCREIF at 13.45% (as of 3/31/15); and Total Infrastructure returned -1.59% vs. the CPI +4% at 3.96%.

E. Articles for Board Member Education / Discussion

1. Dispersion of Returns Will Remain a Feature (T. Rowe Price Global Midyear Market Outlook 2015, June 2015)
2. Opportunities to Gain Yield and Time (T. Rowe Price Global Midyear Market Outlook 2015, June 2015)

F. Call to Audience

Allan Bentkowski announced this would be his last TSRS Board meeting since he will be retiring July 24, 2015. Allan thanked the Board for taking their fiduciary responsibilities seriously and appreciated his opportunities to serve this Board and those in the past.

A motion to offer Mr. Bentkowski a formal thank you for his service and congratulations was made by Michael Coffey, 2nd by Curry Hale, and passed by a vote of 4 – 0 (Chairman Fleming did not vote).

Jorge Hernández thanked the Board for their time and consideration.

Service & Disability Retirements, End of Service Entrants for TSRS Board of Trustees Ratification

6/10/15 - 7/09/15 - July 2015											
Name of Applicant	Department	Type	Effective Date	Date of Birth	Age	Credited Service	Present Value	Member's Accumulated	AFC	Option	Pension
Denman, Daniel T	Water	Normal	7/8/2015	7/2/1951	64.02	27.5955	444,627.45	145,340.49	5,859.37	J&S 100%	3,181.97
Drow, Robert N	Housing & Comm. Develop.	Normal	7/8/2015	11/24/1959	55.62	26.051	272,817.53	86,044.66	3,351.01	J&S 100%	1,747.51
Lee, James R	Library	Deferred	4/6/2015	4/6/1953	62.00	7.7432	52,853.39	20,161.09	2,391.52	Single	416.65
Martinez, Francisco	Parks & Recreation	Normal	6/13/2015	6/3/1950	65.03	10.4311	62,714.56	17,562.38	2,230.91	J&S 100%	433.57
Norman, Tami	Transportation	Disability	6/25/2015	12/22/1959	55.51	10.1428	90,805.35	22,075.44	2,774.64	Single	633.21
Oden, Belinda K	Water	Normal	7/10/2015	7/28/1962	52.95	28.9587	788,425.78	205,220.51	8,184.64	180 mo. Term certain	5,236.46
Robinson, Robbee	Housing & Comm. Develop.	Normal	6/27/2015	9/16/1953	61.78	19.8019	261,665.17	72,242.51	4,629.73	J&S 100%	1,825.71
Sowards, Renee K	Mayor & Council	Normal	7/1/2015	6/19/1952	63.03	25.4539	448,376.05	111,745.11	6,011.48	Single	3,442.86
Spreisterbach, Michael	City Attorney	Normal	7/1/2015	4/24/1947	68.19	24.9354	489,890.59	166,933.20	7,798.08	J&S 50%	4,099.75
									43,231.38		21,017.69
Averages					60.90	20.12	323,575.10	94,147.27	4,803.49		2,335.30

Comparison of Monthly Pension Payments - Beginning of FY 2015 to Current Monthly Pension Payments

	Plan Year beginning 07/01/2014 (*from GRS annual valuation)	Monthly	Annual	June 2015 Pension Payroll		Annualized	Annual change since July 1, 2014	% change
				1	\$			
Service Pensions	2,264	4,860,656	58,327,872	2,312	5,018,393	60,220,717.32	1,892,845	3.25%
Disability Pensions	156	169,123	2,029,477	156	172,186	2,066,237	36,760	1.81%
Survivor Pensions	344	326,541	3,918,488	330	321,001	3,852,016.80	(66,471)	-1.70%
	2,764	5,356,320	64,275,837	2,798	5,511,581	66,138,971	1,863,134	2.90%
				1	\$ 11,901			
				(net) change from previous month				

Report ID : FIN-COT-BA-0001

Run Date : 07/10/2015

Run Time : 10:29 AM

City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Parameter Page

Parameters and Prompts

Fiscal Year	2015
Accounting Period	12
Fund	*
Department	*
Unit	*
Object Code	*

Report Description

The Expenses vs. Actual Report shows expenditures and encumbrances for the selected accounting period and for the selected fiscal year compared against the current expense budget and the unobligated budget balance. The report is sectioned by Department, Fund and Unit and summarized by Object.

Report ID : FIN-COT-BA-0001

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9001 - Normal Retiree Benefit

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	5,015,101.41	5,015,101.41	0.00	59,384,727.56	59,384,727.56	58,050,000	(1,334,727.56)	-2.30 %
Total for 100 - PAYROLL CHGS	0.00	5,015,101.41	5,015,101.41	0.00	59,384,727.56	59,384,727.56	58,050,000	(1,334,727.56)	-2.30 %
Total for Unit 9001 - Normal Retiree Benefit	0.00	5,015,101.41	5,015,101.41	0.00	59,384,727.56	59,384,727.56	58,050,000	(1,334,727.56)	-2.30 %

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9003 - Normal Retiree Beneficiary Benefit

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	289,930.20	289,930.20	0.00	3,422,222.21	3,422,222.21	3,470,000	47,777.79	1.38 %
Total for 100 - PAYROLL CHGS	0.00	289,930.20	289,930.20	0.00	3,422,222.21	3,422,222.21	3,470,000	47,777.79	1.38 %
Total for Unit 9003 - Normal Retiree Beneficiary Benefi	0.00	289,930.20	289,930.20	0.00	3,422,222.21	3,422,222.21	3,470,000	47,777.79	1.38 %

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9020 - Disability Retiree Benefit

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	172,186.43	172,186.43	0.00	2,035,754.01	2,035,754.01	2,145,000	109,245.99	5.09 %
Total for 100 - PAYROLL CHGS	0.00	172,186.43	172,186.43	0.00	2,035,754.01	2,035,754.01	2,145,000	109,245.99	5.09 %
Total for Unit 9020 - Disability Retiree Benefit	0.00	172,186.43	172,186.43	0.00	2,035,754.01	2,035,754.01	2,145,000	109,245.99	5.09 %

City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9021 - Pension Fund Administration

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
101 - SALARIES & WAGES FOR PERMANENT EMPLOYEES	0.00	17,721.60	17,721.60	0.00	186,962.51	186,962.51	191,380	4,417.49	2.31 %
108 - DOWNTOWN ALLOWANCE & DISCOUNTED TRANSIT PASSES	0.00	92.32	92.32	0.00	923.70	923.70	1,160	236.30	20.37 %
113 - SUPPLEMENTAL PENSION CONTRIBUTION	0.00	4,873.44	4,873.44	0.00	47,488.10	47,488.10	52,630	5,141.90	9.77 %
114 - FICA (SOCIAL SECURITY)	0.00	1,344.10	1,344.10	0.00	13,375.23	13,375.23	14,800	1,424.77	9.63 %
115 - WORKERS COMPENSATION INSURANCE	0.00	321.49	321.49	0.00	1,987.82	1,987.82	3,850	1,862.18	48.37 %
116 - GROUP PLAN INSURANCE	0.00	1,247.35	1,247.35	0.00	20,434.72	20,434.72	28,420	7,985.28	28.10 %
117 - STATE UNEMPLOYMENT	0.00	17.34	17.34	0.00	144.50	144.50	300	155.50	51.83 %
196 - INTERDEPARTMENTAL LABOR	0.00	7,433.33	7,433.33	0.00	185,199.96	185,199.96	185,200	0.04	0.00 %
Total for 100 - PAYROLL CHGS	0.00	33,050.97	33,050.97	0.00	456,516.54	456,516.54	477,740	21,223.46	4.44 %
202 - TRAVEL	0.00	1,157.69	1,157.69	0.00	8,007.66	8,007.66	4,000	(4,007.66)	#####
204 - TRAINING	0.00	0.00	0.00	0.00	709.74	709.74	14,000	13,290.26	94.93 %
205 - PARKING & SHUTTLE SERVICE	0.00	0.00	0.00	0.00	225.00	225.00	200	(25.00)	-12.50 %
207 - EXECUTIVE VEHICLE ALLOWANCE	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00 %
212 - CONSULTANTS AND SURVEYS	0.00	0.00	0.00	0.00	30,330.75	30,330.75	65,000	34,669.25	53.34 %
213 - LEGAL	0.00	1,453.50	1,453.50	0.00	19,449.00	19,449.00	50,000	30,551.00	61.10 %
219 - MISCELLANEOUS PROFESSIONAL SERVICES	0.00	94,635.25	94,635.25	0.00	2,749,003.74	2,749,003.74	4,042,700	1,293,696.26	32.00 %
221 - INSUR-PUBLIC LIABILITY	0.00	486.07	486.07	0.00	22,265.14	22,265.14	28,880	6,614.86	22.90 %
232 - R&M MACHINERY & EQUIPMENT	0.00	0.00	0.00	0.00	39.83	39.83	1,200	1,160.17	96.68 %

City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9021 - Pension Fund Administration

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
244 - WASTE DISPOSAL	0.00	0.00	0.00	0.00	55.00	55.00	0	(55.00)	0.00%
245 - TELEPHONE	0.00	0.00	0.00	0.00	0.00	0.00	1,200	1,200.00	100.00 %
252 - RENTS EQUIPMENT	0.00	118.69	118.69	0.00	1,036.08	1,036.08	0	(1,036.08)	0.00%
260 - COMPUTER SOFTWARE MAINTENANCE AGREEMENTS	0.00	0.00	0.00	0.00	13,861.50	13,861.50	41,000	27,138.50	66.19 %
263 - PUBLIC RELATIONS	0.00	0.00	0.00	0.00	2,334.96	2,334.96	2,560	225.04	8.79 %
283 - LICENSES AND PERMITS	0.00	0.00	0.00	0.00	120.00	120.00	0	(120.00)	0.00%
284 - MEMBERSHIPS AND SUBSCRIPTIONS	0.00	0.00	0.00	0.00	1,735.00	1,735.00	1,500	(235.00)	-15.67 %
Total for 200 - PROF CHARGES	0.00	97,851.20	97,851.20	0.00	2,849,173.40	2,849,173.40	4,252,240	1,403,066.60	33.00 %
311 - OFFICE SUPPLIES	0.00	45.58	45.58	0.00	3,107.86	3,107.86	7,500	4,392.14	58.56 %
312 - PRINTING,PHOTOGRAPHY,REPRODUCTION	0.00	3,101.79	3,101.79	0.00	11,190.29	11,190.29	7,500	(3,690.29)	-49.20 %
314 - POSTAGE	0.00	84.98	84.98	0.00	6,889.96	6,889.96	10,000	3,110.04	31.10 %
317 - COMPUTER SOFTWARE < \$100,000	0.00	0.00	0.00	0.00	280.10	280.10	0	(280.10)	0.00%
341 - BOOK, PERIODICALS AND RECORDS	0.00	0.00	0.00	0.00	308.50	308.50	250	(58.50)	-23.40 %
345 - FURNISHINGS, EQUIPMENT AND TOOLS < \$5,000	0.00	0.00	0.00	0.00	0.00	0.00	1,000	1,000.00	100.00 %
346 - COMPUTER EQUIPMENT < \$5,000	0.00	0.00	0.00	0.00	721.07	721.07	1,000	278.93	27.89 %
Total for 300 - SUPPLIES	0.00	3,232.35	3,232.35	0.00	22,497.78	22,497.78	27,250	4,752.22	17.44 %
Total for Unit 9021 - Pension Fund Administration	0.00	134,134.52	134,134.52	0.00	3,328,187.72	3,328,187.72	4,757,230	1,429,042.28	30.04 %

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9022 - Disability Retiree Beneficiary Benefit

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
105 - PAYROLL PENSION	0.00	31,071.20	31,071.20	0.00	373,754.04	373,754.04	300,000	(73,754.04)	-24.58 %
Total for 100 - PAYROLL CHGS	0.00	31,071.20	31,071.20	0.00	373,754.04	373,754.04	300,000	(73,754.04)	-24.58 %
Total for Unit 9022 - Disability Retiree Beneficiary Ben	0.00	31,071.20	31,071.20	0.00	373,754.04	373,754.04	300,000	(73,754.04)	-24.58 %

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9023 - ACTIVE MEMBER REFUNDS-CONTRBS

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	270,489.14	270,489.14	0.00	1,907,768.20	1,907,768.20	2,400,000	492,231.80	20.51 %
Total for 100 - PAYROLL CHGS	0.00	270,489.14	270,489.14	0.00	1,907,768.20	1,907,768.20	2,400,000	492,231.80	20.51 %
Total for Unit 9023 - ACTIVE MEMBER REFUNDS-CON	0.00	270,489.14	270,489.14	0.00	1,907,768.20	1,907,768.20	2,400,000	492,231.80	20.51 %

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9025 - INTEREST ON REFUNDS

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	4,922.03	4,922.03	0.00	29,597.09	29,597.09	50,000	20,402.91	40.81 %
Total for 100 - PAYROLL CHGS	0.00	4,922.03	4,922.03	0.00	29,597.09	29,597.09	50,000	20,402.91	40.81 %
Total for Unit 9025 - INTEREST ON REFUNDS	0.00	4,922.03	4,922.03	0.00	29,597.09	29,597.09	50,000	20,402.91	40.81 %

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9026 - DWE SYSTEM BENEFIT PAYMENT

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	0.00	0.00	0.00	316,820.15	316,820.15	200,000	(116,820.15)	-58.41 %
Total for 100 - PAYROLL CHGS	0.00	0.00	0.00	0.00	316,820.15	316,820.15	200,000	(116,820.15)	-58.41 %
Total for Unit 9026 - DWE SYSTEM BENEFIT PAYMEN	0.00	0.00	0.00	0.00	316,820.15	316,820.15	200,000	(116,820.15)	-58.41 %

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9027 - CREDITABLE SERVICE TRANS(ASRS)

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	0.00	0.00	0.00	123,394.04	123,394.04	0	(123,394.04)	0.00%
Total for 100 - PAYROLL CHGS	0.00	0.00	0.00	0.00	123,394.04	123,394.04	0	(123,394.04)	0.00%
Total for Unit 9027 - CREDITABLE SERVICE TRANS(A:	0.00	0.00	0.00	0.00	123,394.04	123,394.04	0	(123,394.04)	0.00%

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City of Tucson
Budget vs Actual Expenses
Through: June, 2015
For Fiscal Year 2015

Department 900 - TUCSON SUPPL RETIREMENT SYSTEM

Fund 072 - TUCSON SUPP RETIREMENT SYSTEM

Unit 9028 - EXCESS SER TRS/CTY CONT(ASRS)

Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
186 - TSRS REFUNDS	0.00	0.00	0.00	0.00	18,313.66	18,313.66	0	(18,313.66)	0.00%
Total for 100 - PAYROLL CHGS	0.00	0.00	0.00	0.00	18,313.66	18,313.66	0	(18,313.66)	0.00%
Total for Unit 9028 - EXCESS SER TRS/CTY CONT(ASR	0.00	0.00	0.00	0.00	18,313.66	18,313.66	0	(18,313.66)	0.00%
Total for Fund 072 - TUCSON SUPP RETIREMENT SYS	0.00	5,917,834.93	5,917,834.93	0.00	70,940,538.68	70,940,538.68	71,372,230	431,691.32	0.60 %
Total for Department 900 - TUCSON SUPPL RETIREME	0.00	5,917,834.93	5,917,834.93	0.00	70,940,538.68	70,940,538.68	71,372,230	431,691.32	0.60 %
Grand Totals	0.00	5,917,834.93	5,917,834.93	0.00	70,940,538.68	70,940,538.68	71,372,230	431,691.32	0.60 %

PROPOSED REVISIONS TO TUCSON CITY CODE

TSRS PROVISIONS

1. **Funding Policy** (statutory authority for Rounding Policy)

Sec. 22-30(h). “Annual Required Contribution” or “ARC” means the annual amount necessary to fund all employee segment normal cost amounts plus that amount necessary to satisfy the annual amortization requirements for the System’s unfunded accrued liability, as determined by the System actuary in accordance with sound actuarial principles, and as set by the Board on a fiscal year basis. The Annual Required Contribution is expressed as a percentage of the City’s active Member payroll costs for a fiscal year. Changes in accrued liabilities, and actuarial experience **and the funding policy maintained by the Board** may increase or decrease the Annual Required Contribution.

2. **Final Leave Cash Outs – Tier I Members** (clarification)

Sec. 22-30(i). “Average Final Monthly Compensation” or “AFMC” means the Member's average compensation for the applicable employment period, as defined below, within the one hundred twenty (120) months immediately preceding the member's termination date, during which the member's compensation was the highest. The "applicable employment period" for a tier I member shall be a period of thirty-six (36) consecutive calendar months of employment with the city and the "applicable employment period" for a tier II member shall be a period of sixty (60) consecutive calendar months of employment with the city. If the member has less than the number of consecutive calendar months of employment required for the applicable employment period calculation (thirty-six (36) months or sixty (60) months), the AFMC shall be the average of the compensation earned by the member during the period of employment with the city. For tier I members, accumulated unused vacation and sick leave hours ~~may~~ **shall** be included in the thirty-six (36) month period at the member's final pay rate, with an equal number of hours subtracted from the beginning of the thirty-six (36) month period, provided that the member contribution requirements of section [22-34\(f\)](#) are satisfied **and that the inclusion of the accumulated unused vacation and sick leave hours does not result in a decrease in the AFMC**. Accumulated unused vacation and sick leave hours shall not be included in the calculation of average final monthly compensation for tier II members. The calculation of average final monthly compensation is subject to the special adjustment rules set forth in section [22-43\(b\)](#) (part-time employment) and section [22-43\(c\)](#) (unpaid authorized leave). For the period beginning on July 1, 2009, and ending on June 30, 2010, any active member who is subject to a reduction in pay in lieu of furlough shall continue to receive compensation credit for purposes of AFMC calculation during the reduction period at the rate of pay in effect for the member immediately preceding the pay reductions in lieu of furlough.

3. **Disability Benefits** (SSA determination as evidence; application timing changes)

Sec. 22-30(jj). "Total and Permanent Disability" means the inability to engage in any substantial gainful activity with the City by reason of any medically determinable physical or mental impairment that can be expected to last for a continuous period of not less than twelve (12) months **result in death or continue for a long and indefinite duration. If the Social Security Administration determines that a Member is totally and permanently disabled for purposes of Social Security Disability Insurance, the Social Security Administration's determination shall be treated as conclusive evidence of Total and Permanent Disability; provided, however, that the Board shall make an independent determination of the date on which any Disability Retirement Benefit shall commence in accordance with section 22-39(b).**

Sec. 22-39(a). Qualification. If a Member **terminates from employment with the City prior to reaching Normal Retirement Age** is not yet eligible for normal retirement, the Member may apply for Disability Retirement Benefits ~~if the member has ten (10) or more years of accrued service and the member is determined, in accordance with applicable rules, to have a total and permanent disability.~~ **To be eligible to receive Disability Retirement Benefits, the Member must (1) apply for Disability Retirement Benefits within twelve (12) months of the date of termination from employment; (2) be credited with ten (10) or more years of Accrued Service, inclusive of accrued vacation and sick leave; (3) [Option #1 - establish that he or she terminated from employment with the City as a result of a disabling mental or physical impairment] [Option #2 – establish that he or she suffered or developed a disabling mental or physical impairment while employed by the City]; and (4) be determined, in accordance with applicable rules, to have a Total and Permanent Disability.**

Sec. 22-39(b). Application Process. An application for Disability Retirement Benefits may be filed by the Member in accordance with the policies and procedures of the System Administrator. **Unless waived by the Board in light of a Social Security Administration determination of Total and Permanent Disability,** ~~the~~ Board's physician shall examine the Member and certify in a written report to the Board whether the Member suffers from a Total and Permanently Disability. The report shall also state when the Member should be reexamined. If the Board determines that the Member should receive Disability Retirement Benefits, ~~the Board shall determine the date on which the disability retirement shall commence.~~ **the Disability Retirement Benefits shall commence as of the date of the System Administrator received the Member's completed application for Disability Retirement Benefits. Notwithstanding the foregoing, the Board may, in its discretion, establish a different commencement date for Disability Retirement Benefits if warranted by the circumstances of a particular application.** Disability Retirement Benefits shall not be paid for periods the Member elects to receive sick and vacation leave pay.

4. **Paid Military Leave – Member Contributions** (Compliance Change)

Sec. 22-34(e). Qualified Military Service. A Member who leaves employment for Qualified Military Service and is timely reemployed by the City and meets all other applicable requirements for benefits following Qualified Military Service including, without limitation, the

requirements set forth in the city's Administrative Directive 2.01-7G regarding military leave, as amended, shall be permitted (but not required) to make up missed Member contributions to the system. Any reemployed member who wishes to make up missed Member contributions shall contribute all or a portion of the Member contributions that would have been made by the Member but for the Qualified Military Service, calculated at the Compensation rate in effect for the Member immediately preceding the commencement of the Qualified Military Service and the Member contribution rate in effect during the Qualified Military Service, and without Interest or any other adjustment. The missed Member contributions shall be contributed to the System during a period that begins on the date of reemployment and ends on the earliest of (1) the date that is five (5) years from the date of reemployment, (2) the date that marks the end of a period which is three times the length of the Member's most recent period of Qualified Military Service, or (3) the Member's Termination Date. Any and all Member contributions made up pursuant to this section shall be treated as regular Member contributions made in accordance with Section 22-34(d). Following the contribution of missed Member contributions to the System, the System Administrator shall take all steps necessary to increase the Member's accrued benefit to include the portion of the Member's Qualified Military Service covered by the missed Member contributions. **Notwithstanding the foregoing, to the extent the Member is afforded paid military leave in accordance with the City's Administrative Directive 2.01-7G, as amended, Member contributions shall be made from military leave pay on the same basis as Member contributions are made by actively employed Members.**

5. **Government and Military Service Purchases** (Expand purchase eligibility)

Sec. 22-36(e). Additional Service -- Prior Government or Military Service. Subject to the provisions of Section 22-36(g), a ~~contributing~~ Member **who has not requested a refund of the Member's accumulated contribution account or filed a retirement application** may elect to purchase Additional Service in the System for periods of Prior Government or Military Service. Additional Service will be used for benefit accrued purposes only, and will not be considered in the determination of whether a Member is Vested. Any Member wishing to purchase Additional Service shall furnish all documentation required by the System Administrator, in its discretion, to substantiate the prior service at the time of making an application to purchase the Additional Service. This provision shall govern the repurchase of prior City service credit forfeited upon receipt of a refund pursuant to Section 22-41, subject to the special redeposit rules of Section 22-36(h). It is the stated and declared purpose of this section to allow for the purchase of all Prior Government or Military Service for which a Member is not entitled to receive, presently or in the future, a benefit from another retirement System. To this end, the provisions of this Section shall be liberally construed.

6. **Commencement of Pension to Deferred Vested Members** (Compliance Change)

Sec. 22-37(d). Payment of Benefits; Deferred Commencement. Retirement Benefits are paid monthly in arrears. **Generally, a** Member may elect to defer the date payments begin as permitted by law provided, however, that no actuarial adjustment or retroactive adjustment shall be made to the Retirement Benefit as a result of the delayed commencement. **Notwithstanding the foregoing, if a Member delays commencement of Retirement Benefits beyond Normal Retirement Age, by affirmative election or failure to file a retirement application, an**

actuarial adjustment to the Retirement Benefit shall be made to reflect only the delayed commencement after the Normal Retirement Age.

7. **Non-Spouse Beneficiary on J&S Election** (Compliance Change)

Sec. 22-42(c). Joint and Survivor Annuity. A Member eligible for retirement may elect to receive his Retirement Benefit payable in a joint and survivor annuity which provides payments to the Member for the remainder of the Member's life and then provides payments to the surviving Beneficiary for the remainder of the Beneficiary's life. In making this election, the monthly benefit to be paid to the surviving Beneficiary following the death of the Member may be one hundred percent (100%), seventy-five percent (75%) or fifty percent (50%) of the monthly benefit the Member had been receiving. All payments will cease upon the death of the Member or the beneficiary, whichever shall occur last. **The Member's designation of a Beneficiary to receive any survivor benefit payable under a joint and survivor annuity shall be subject to the requirements of section 22-43(f) and Code Section 401(a)(9), including the limitations on non-spouse beneficiaries, and any joint and survivor annuity election shall be adjusted as necessary for compliance with the Code.**

8. **Rehire of Retirees** (Codification of Practice)

Sec. 22-37(g) Suspension of Pension Benefits upon Reemployment. Retirement Benefits payable to a retired Member shall be suspended during the retired Member's period of reemployment with the City unless (1) at least twelve (12) months have elapsed between the Member's retirement from the City and the retired Member's reemployment date, and (2) the retired Member is engaged to work in a non-permanent employment classification. **The retired Member shall be permitted to work in consecutive or successive non-permanent employment classifications without triggering a suspension of Retirement Benefits provided that the Member satisfied the twelve (12) month break rule set forth above and provided further that the non-permanent employment classifications are separate and distinct employment positions and are not a subterfuge to avoid the suspension rules of this section.** In no event shall any re-employed retired Member acquire Credited Service or credited compensation or contribute to the System.

9. **Post Retirement Marital Changes** (Divorce/Remarriage Have No Impact on Elections)

Sec. 22-42(a). Explanation of Benefit Options. A Member who is eligible to receive a Retirement Benefit may request from the System Administrator information regarding the Retirement Benefit payment options available. No pension is automatically payable hereunder, and all eligible Members must make appropriate retirement elections under the System. The Member and Spouse, if any, shall sign a statement acknowledging that the Retirement Benefit payment options have been satisfactorily explained and shall make a written election of one (1) of the Retirement Benefit payment options, all in accordance with the policies and procedures of the System Administrator. The benefit election can be revoked or changed by the Member by filing a written notice of revocation or change with the System Administrator, subject to any applicable Spousal acknowledgement requirements, any time prior to ratification of the Retirement Benefit by the Board. The benefit election is irrevocable upon Board ratification of

the Member's application for retirement benefits, **regardless of any changes in the Member's marital status.**

Sec. 22-43.1(b). System Administrator Review and Approval. The System Administrator is responsible for the review and approval of any Domestic Relations Order impacting benefits or rights of a Member under this System and which is presented to the System Administrator in a timely fashion. The System Administrator shall determine whether the Domestic Relations Order can be administered and benefits paid in accordance with the applicable requirements of the Order, the System and the Code. Any Domestic Relations Order accepted by the System Administrator shall be referred to as a System Approved Domestic Relations Order. To the extent permitted by law, the System Administrator's decision regarding a Domestic Relations Order shall be final and binding. The City, the Board, and the System Administrator shall not be responsible for the payment of any System benefits in contravention of a Domestic Relations Order when the Domestic Relations Order is not timely presented to the System Administrator for review. **Additionally, upon ratification of a Member's retirement application by the Board, all benefit payment elections (including those filed by the Member, ordered pursuant to a System Approved Domestic Relations Order or filed by an alternate payee) shall become irrevocable and no change in benefit options shall be permitted, regardless of any changes in the marital status of the Member or the alternate payee.**

10. **Board Authority** (Specify Hearing/Appeal Authority)

Sec. 22-45(i). Additional Powers and Duties. In addition to all other powers and duties, the Board shall:

- (1) Keep a record of all of its proceedings, and such record shall be open to inspection by Members and the public;
- (2) Determine the Credited Service, the Compensation, the Average Final Monthly Compensation, and the age of all members; and when the same cannot be determined from the records, it may make the best available estimates thereof;
- (3) Make annually a report to the Mayor and City Council covering the operations of the System for the preceding fiscal year, including its financial conditions as of fiscal closing;
- (4) Review and provide written recommendations to the Mayor and City Council on all proposed ordinances and resolutions not originating from the Board that amend, modify or delete provisions of the System. The Board shall be given forty-five (45) days advance notice prior to any such Mayor and Council action regarding the System;
- (5) Invest the funds of the System;
- (6) Adopt necessary rules and regulations governing the administration of the System; and

(7) **Hear and resolve employee, Member and Beneficiary claims relating to the System; and**

(8) Do all other things necessary for the proper administration of the provisions of the System.

11. **Corrected Section References**

Sec. 22-33(e). Reentry into Membership. Any former Member who is reemployed by the City in an eligible job classification shall become a Member of the System. The Member contributions required from a rehired Member shall be determined in accordance with section 22-34(c) and Credited Service accrued by the rehired Member shall be determined in accordance with Section 22-36(h). The accrued benefit earned by a rehired Member shall be determined based on the Member's status as a Tier I Member or a Tier II Member, as those terms are defined in section 22-30(~~gg~~**hh**) and 22-30(~~hh~~**ii**), respectively. The rules set forth herein regarding rehired Members shall apply to members who return to employment with the City following a layoff or any other event which constitutes a Termination Date under section 22-30(~~ff~~**gg**).

12. **Other Possible Changes**

Propose independent, appointed structure for System Administrator?

Add additional independent (no City ties) Board members?

Modifications to contribution calculation – codification of additional funding beyond rounding policy?

Item B2

July 14, 2015

Mr. Michael Hermanson, CPA
Pension Manager for the City of Tucson
255 W. Alameda, 5th Floor
Tucson, AZ 85701

Re: Discussion on Open and Closed Amortization

Dear Mike:

Per your request, we are providing information on closed and open amortization funding approaches.

CLOSED AMORTIZATION

Most of us are familiar with closed amortization - our houses are due to be paid off in 30 years, our cars are to be paid off in five years. The following chart shows the projection of the Plan's unfunded liability (\$ in millions) as if the Board were to adopt a funding policy based on Normal Cost plus 20-year Closed Level Percent of Pay Amortization. In the first five years, the payments go down as the deferred asset gains are recognized. After all deferred asset gains are recognized, the payments start to increase by roughly three percent per year, consistent with projected payroll growth. After 20 years, the unfunded liability is projected to be paid off.

20-year Closed, Level Percent of Pay			
Valuation Year	Unfunded Liability	Amortization Payment	Amortization Payment (% of Pay)
2014	\$356.4	\$26.0	20.52%
2015	\$319.7	\$24.1	18.87%
2016	\$299.6	\$23.4	18.09%
2017	\$272.4	\$22.2	16.83%
2018	\$253.5	\$21.5	16.07%
2019	\$249.3	\$22.2	16.24%
2020	\$244.0	\$22.8	16.40%
2021	\$237.7	\$23.5	16.52%
2022	\$230.3	\$24.2	16.62%
2023	\$221.5	\$24.9	16.70%
2024	\$211.4	\$25.7	16.77%
2025	\$199.8	\$26.5	16.83%
2026	\$186.4	\$27.3	16.87%
2027	\$171.3	\$28.1	16.91%
2028	\$154.2	\$28.9	16.93%
2029	\$135.0	\$29.8	16.96%
2030	\$113.5	\$30.7	16.97%
2031	\$89.5	\$31.7	16.99%
2032	\$62.7	\$32.6	17.00%
2033	\$33.0	\$33.7	17.01%
2034	\$0.0	\$0.0	0.00%

Discount rate 7.25%, Payroll Growth 3.00%

OPEN AMORTIZATION

In open amortization, payment amounts are recalculated each year based on the outstanding balance that year, and the years to amortize remains the same. In defined benefit plans, the unfunded liability each year may fluctuate, depending upon a variety of factors including market returns. The following chart shows the projection of the Plan’s unfunded liability (\$ in millions) as if the Board were to adopt a funding policy based on Normal Cost plus 20-year Open Level Percent of Pay Amortization. In the first five years, the payments decrease as the deferred asset gains are recognized. After all deferred asset gains are recognized, the payments remain fairly level as a dollar amount, which will be a diminishing percentage relative to a growing payroll. Unlike the closed amortization policy, an Unfunded Accrued Liability of \$275.8 million will exist at the end of the 20-year period.

Open amortization is often used when the life of the entity is considered perpetual; such as Cities, Counties, States and other municipalities. Private sector employers, who can go out of business and who do not have a “perpetual” life, are not allowed to use open amortization in the funding of their pension obligations.

20-year Open, Level Percent of Pay			
Valuation Year	Unfunded Liability	Amortization Payment	Amortization Payment (% of pay)
2014	\$356.4	\$26.0	20.52%
2015	\$321.3	\$23.4	18.34%
2016	\$303.6	\$22.1	17.09%
2017	\$279.6	\$20.4	15.49%
2018	\$264.8	\$19.3	14.42%
2019	\$265.3	\$19.3	14.18%
2020	\$265.9	\$19.4	13.93%
2021	\$266.5	\$19.4	13.65%
2022	\$267.0	\$19.5	13.36%
2023	\$267.6	\$19.5	13.06%
2024	\$268.3	\$19.6	12.76%
2025	\$268.9	\$19.6	12.46%
2026	\$269.6	\$19.7	12.16%
2027	\$270.3	\$19.7	11.86%
2028	\$271.0	\$19.8	11.56%
2029	\$271.8	\$19.8	11.26%
2030	\$272.5	\$19.9	10.98%
2031	\$273.3	\$19.9	10.69%
2032	\$274.1	\$20.0	10.41%
2033	\$274.9	\$20.0	10.13%
2034	\$275.8	\$20.1	9.87%

Discount rate 7.25%, Payroll Growth 3.00%

Open amortization is frequently seen as a method that produces a more stable contribution requirement. The tradeoff between open and closed amortization is between the two policies of (1) paying off the Unfunded Accrued Liability and (2) budget predictability and lower contribution requirements.

CURRENT FUNDING POLICY

The Board’s Funding Policy adopted as of December 30th, 2014 is based on an underlying Open Level Percentage of Pay Amortization with a 20-year period; however adjustments after the fact make the contribution more consistent with a Closed Amortization Policy.

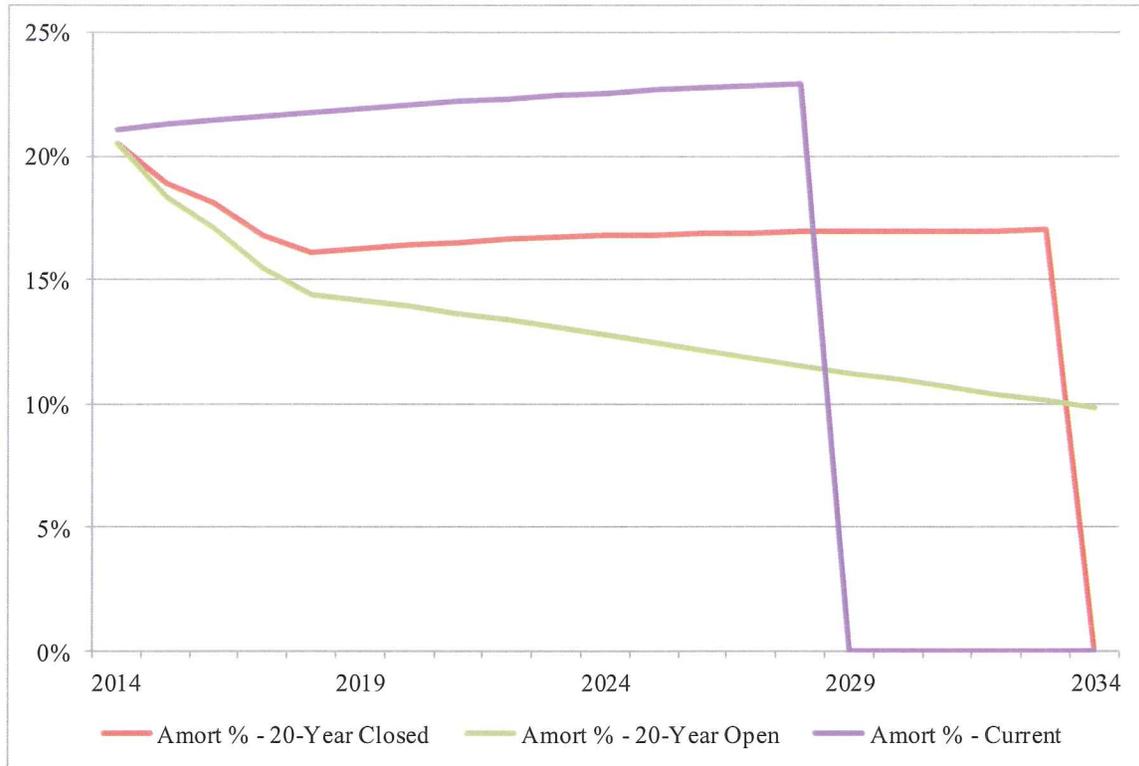
The rounding up of both City and Employee contributions, after the Actuarial Contribution is calculated, add some margin on the contribution level and accelerate the funding of the Plan. In addition, the funding policy states the following:

“As of December 2014, the Board intends to address the unfunded accrued liabilities in TSRS. As of December 2014, the Board intends to encourage the City to extinguish the TSRS unfunded liability over a 12 – 15 year time period by recommending that the City contribution to TSRS remain fixed at a minimum of 27.5% of payroll, subject to changing market conditions.”

Keeping the City contribution at a minimum level of 27.5% makes the funding policy much more consistent with a closed level percentage of pay amortization policy, and in particular, the current projection shows the period to full funding is 15 years.

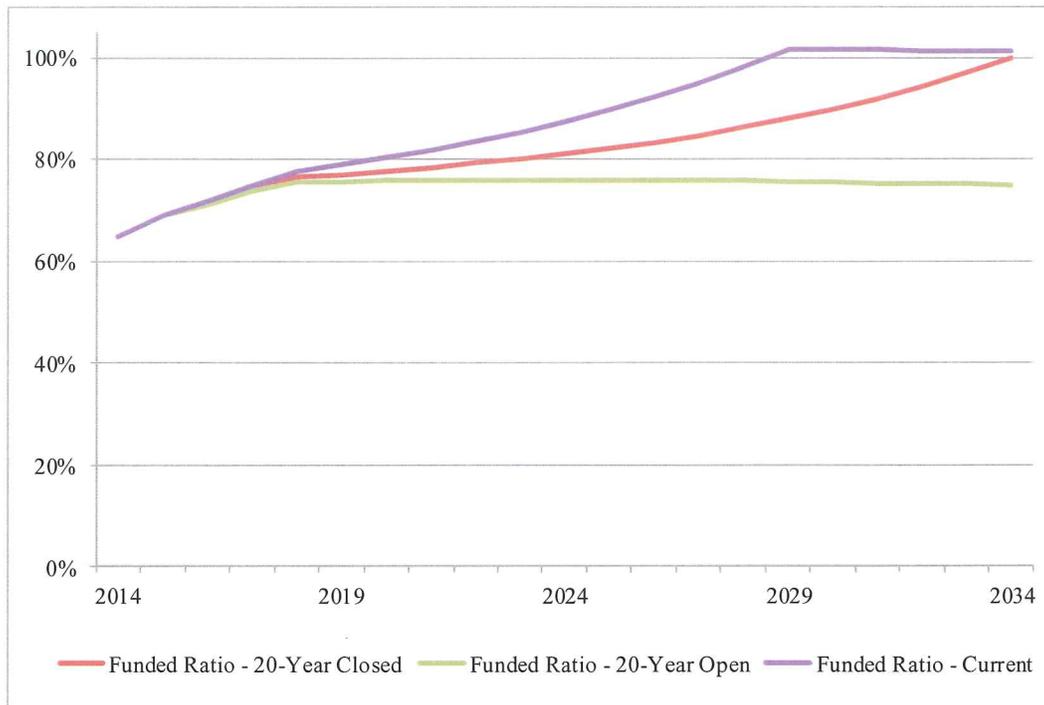
Current Funding Policy			
Valuation Year	Unfunded Liability	Amortization Payment	Amortization Payment (as a % of pay)
2014	\$356.4	\$26.0	21.07%
2015	\$319.7	\$23.3	21.28%
2016	\$297.2	\$21.7	21.44%
2017	\$266.2	\$19.4	21.61%
2018	\$241.3	\$17.6	21.76%
2019	\$229.1	\$16.7	21.92%
2020	\$215.3	\$15.7	22.06%
2021	\$199.7	\$14.6	22.20%
2022	\$182.1	\$13.3	22.32%
2023	\$162.2	\$11.8	22.44%
2024	\$139.9	\$10.2	22.55%
2025	\$114.9	\$8.4	22.65%
2026	\$87.1	\$6.3	22.74%
2027	\$56.0	\$4.1	22.83%
2028	\$21.6	\$1.6	22.91%
2029	(\$16.7)	N/A	N/A

COMPARISON OF AMORTIZATION PAYMENT AS A % OF PAY



Both the closed amortization policy and the current Board funding policy show amortization payments that are relatively level as a percentage of pay until full funding is reached. The open amortization shows the lowest amortization payment trajectory, but leaves an unfunded liability of \$275.8 million at the end of 20 years.

COMPARISON OF FUNDED RATIO



Both the closed amortization policy and the current Board funding policy reach full funding within the next 20 years. The open amortization funded ratio plateaus at around 75%.

SURVEY DATA

We have surveyed the GRS data base and found, out of 347 surveyed “City “clients that 152 use open amortization and 195 use closed amortization. Some entities have moved to a hybrid approach that looks at the change in unfunded on a year-by-year basis and amortizes that new piece of unfunded over a closed period of time. Tucson’s approach is an even more unique approach for it states a policy of open amortization and develops the actuarially determined contribution on an open basis, while the actual contribution accelerates the funding and produces similar results to a 15-year closed funding policy.

CLOSING

The analysis shown in this report is based on the June 30, 2014 actuarial valuation and assumptions. The projections assume a constant active member population. Further projection detail is shown in the Appendices.

The projection results are considered to be for purposes of making funding decisions. The results presented herein may not be applicable for other purposes.

The actuarial assumptions represent estimates of future experience and are not market measures. The results of any actuarial valuation and projection are dependent upon the actuarial assumptions used.

Actual results (and future measures) can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future actuarial measurements. The actuarial calculations presented in this Report are intended to provide information for rational decision making.

The undersigned are independent actuaries and consultants. Leslie Thompson and Dana Woolfrey are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Sincerely,



Leslie Thompson, FSA, FCA, EA, MAAA
Senior Consultant



Dana Woolfrey, FSA, FCA, EA, MAAA
Consultant

**Tucson Supplemental Retirement System
Open Group Projection as of June 30, 2014
Twenty-year Level Percent of Pay Closed Amortization Funding Policy**

Appendix I

Valuation Year	Actuarial Accrued Liability	Actuarial Value of Assets	Funded Ratio	Unfunded Accrued Liability (UAL)	Normal Cost (\$ amount)	Normal Cost (% of pay)	20-Year Amortization of the UAL	UAL (% of pay)	Covered Payroll	Total Computed Contribution	Combined Member Financed Portion	City Financed Portion	City Financed Portion in Dollars	Expected Benefit Payments
2014	\$1,012.39	\$656.00	64.8%	\$356.40	\$14.02	11.71%	\$25.99	20.52%	\$126.64	32.23%	5.28%	26.95%	\$34	\$67.46
2015	\$1,030.88	\$711.19	69.0%	\$319.68	\$13.95	11.51%	\$24.11	18.87%	\$127.77	30.38%	5.29%	25.09%	\$32	\$70.69
2016	\$1,047.27	\$747.72	71.4%	\$299.55	\$13.94	11.35%	\$23.43	18.09%	\$129.50	29.44%	5.29%	24.15%	\$31	\$73.61
2017	\$1,061.81	\$789.45	74.3%	\$272.36	\$13.97	11.19%	\$22.15	16.83%	\$131.63	28.02%	5.30%	22.72%	\$30	\$76.36
2018	\$1,074.59	\$821.05	76.4%	\$253.54	\$14.02	11.04%	\$21.52	16.07%	\$133.90	27.11%	5.30%	21.81%	\$29	\$79.06
2019	\$1,085.55	\$836.28	77.0%	\$249.28	\$14.10	10.89%	\$22.16	16.24%	\$136.48	27.13%	5.31%	21.82%	\$30	\$81.80
2020	\$1,094.55	\$850.50	77.7%	\$244.04	\$14.22	10.75%	\$22.83	16.40%	\$139.21	27.15%	5.31%	21.83%	\$30	\$84.25
2021	\$1,101.77	\$864.03	78.4%	\$237.74	\$14.38	10.62%	\$23.51	16.52%	\$142.32	27.14%	5.32%	21.82%	\$31	\$86.32
2022	\$1,107.53	\$877.25	79.2%	\$230.28	\$14.56	10.50%	\$24.22	16.62%	\$145.73	27.12%	5.32%	21.80%	\$32	\$88.21
2023	\$1,111.93	\$890.40	80.1%	\$221.53	\$14.77	10.38%	\$24.95	16.70%	\$149.37	27.08%	5.32%	21.76%	\$33	\$90.08
2024	\$1,114.93	\$903.53	81.0%	\$211.40	\$15.00	10.27%	\$25.70	16.77%	\$153.26	27.04%	5.32%	21.72%	\$33	\$91.75
2025	\$1,116.66	\$916.90	82.1%	\$199.75	\$15.26	10.17%	\$26.48	16.83%	\$157.36	27.00%	5.32%	21.67%	\$34	\$93.24
2026	\$1,117.23	\$930.78	83.3%	\$186.44	\$15.54	10.08%	\$27.28	16.87%	\$161.65	26.95%	5.32%	21.63%	\$35	\$94.48
2027	\$1,116.83	\$945.51	84.7%	\$171.32	\$15.85	9.99%	\$28.10	16.91%	\$166.19	26.90%	5.32%	21.58%	\$36	\$95.64
2028	\$1,115.52	\$961.28	86.2%	\$154.23	\$16.18	9.90%	\$28.95	16.93%	\$170.96	26.83%	5.31%	21.52%	\$37	\$96.57
2029	\$1,113.48	\$978.44	87.9%	\$135.03	\$16.54	9.83%	\$29.83	16.96%	\$175.91	26.79%	5.31%	21.48%	\$38	\$97.20
2030	\$1,110.99	\$997.49	89.8%	\$113.50	\$16.92	9.76%	\$30.73	16.97%	\$181.05	26.73%	5.30%	21.43%	\$39	\$97.55
2031	\$1,108.34	\$1,018.88	91.9%	\$89.46	\$17.33	9.70%	\$31.67	16.99%	\$186.39	26.69%	5.30%	21.39%	\$40	\$97.63
2032	\$1,105.83	\$1,043.13	94.3%	\$62.70	\$17.77	9.65%	\$32.63	17.00%	\$192.02	26.65%	5.29%	21.35%	\$41	\$97.57
2033	\$1,103.64	\$1,070.67	97.0%	\$32.97	\$18.22	9.60%	\$33.65	17.01%	\$197.82	26.61%	5.29%	21.33%	\$42	\$97.33
2034	\$1,101.99	\$1,101.99	100.0%	\$0.00	\$18.69	9.56%	\$0.00	0.00%	\$203.82	9.56%	5.28%	4.28%	\$9	\$96.95

The assumptions, except where stated otherwise are the same as those used in the June 30, 2014 report.

All dollar amounts in millions

5% contribution rate for members hired prior to 7/1/2006

6.75% contribution rate for members hired after 6/30/2006 and before 7/1/2011

5.25% contribution rate for members hired after to 6/30/2011

**Tucson Supplemental Retirement System
Open Group Projection as of June 30, 2014
Twenty-year Level Percent of Pay Open Amortization Funding Policy**

Appendix II

Valuation Year	Actuarial Accrued Liability	Actuarial Value of Assets	Funded Ratio	Unfunded Accrued Liability (UAL)	Normal Cost (\$ amount)	Normal Cost (% of pay)	20-Year Amortization of the UAL	UAL (% of pay)	Covered Payroll	Total Computed Contribution	Combined Member Financed Portion	City Financed Portion	City Financed Portion in Dollars	Expected Benefit Payments
2014	\$1,012.39	\$656.00	64.8%	\$356.40	\$14.02	11.71%	\$25.99	20.52%	\$126.64	32.23%	5.28%	26.95%	\$34	\$67.46
2015	\$1,030.88	\$709.57	68.8%	\$321.30	\$13.95	11.51%	\$23.43	18.34%	\$127.77	29.85%	5.29%	24.56%	\$31	\$70.69
2016	\$1,047.27	\$743.68	71.0%	\$303.58	\$13.94	11.35%	\$22.13	17.09%	\$129.50	28.44%	5.29%	23.15%	\$30	\$73.61
2017	\$1,061.81	\$782.17	73.7%	\$279.64	\$13.97	11.19%	\$20.39	15.49%	\$131.63	26.68%	5.30%	21.38%	\$28	\$76.36
2018	\$1,074.59	\$809.77	75.4%	\$264.82	\$14.02	11.04%	\$19.31	14.42%	\$133.90	25.46%	5.30%	20.16%	\$27	\$79.06
2019	\$1,085.55	\$820.22	75.6%	\$265.34	\$14.10	10.89%	\$19.35	14.18%	\$136.48	25.07%	5.31%	19.76%	\$27	\$81.80
2020	\$1,094.55	\$828.66	75.7%	\$265.89	\$14.22	10.75%	\$19.39	13.93%	\$139.21	24.68%	5.31%	19.37%	\$27	\$84.25
2021	\$1,101.77	\$835.32	75.8%	\$266.45	\$14.38	10.62%	\$19.43	13.65%	\$142.32	24.27%	5.32%	18.95%	\$27	\$86.32
2022	\$1,107.53	\$840.50	75.9%	\$267.03	\$14.56	10.50%	\$19.47	13.36%	\$145.73	23.86%	5.32%	18.54%	\$27	\$88.21
2023	\$1,111.93	\$844.30	75.9%	\$267.63	\$14.77	10.38%	\$19.51	13.06%	\$149.37	23.44%	5.32%	18.12%	\$27	\$90.08
2024	\$1,114.93	\$846.67	75.9%	\$268.26	\$15.00	10.27%	\$19.56	12.76%	\$153.26	23.03%	5.32%	17.71%	\$27	\$91.75
2025	\$1,116.66	\$847.74	75.9%	\$268.92	\$15.26	10.17%	\$19.61	12.46%	\$157.36	22.63%	5.32%	17.31%	\$27	\$93.24
2026	\$1,117.23	\$847.63	75.9%	\$269.60	\$15.54	10.08%	\$19.66	12.16%	\$161.65	22.24%	5.32%	16.92%	\$27	\$94.48
2027	\$1,116.83	\$846.54	75.8%	\$270.30	\$15.85	9.99%	\$19.71	11.86%	\$166.19	21.85%	5.32%	16.53%	\$27	\$95.64
2028	\$1,115.52	\$844.49	75.7%	\$271.02	\$16.18	9.90%	\$19.76	11.56%	\$170.96	21.46%	5.31%	16.15%	\$28	\$96.57
2029	\$1,113.48	\$841.71	75.6%	\$271.76	\$16.54	9.83%	\$19.81	11.26%	\$175.91	21.09%	5.31%	15.78%	\$28	\$97.20
2030	\$1,110.99	\$838.47	75.5%	\$272.53	\$16.92	9.76%	\$19.87	10.98%	\$181.05	20.74%	5.30%	15.44%	\$28	\$97.55
2031	\$1,108.34	\$835.03	75.3%	\$273.31	\$17.33	9.70%	\$19.93	10.69%	\$186.39	20.39%	5.30%	15.09%	\$28	\$97.63
2032	\$1,105.83	\$831.71	75.2%	\$274.11	\$17.77	9.65%	\$19.99	10.41%	\$192.02	20.06%	5.29%	14.77%	\$28	\$97.57
2033	\$1,103.64	\$828.70	75.1%	\$274.94	\$18.22	9.60%	\$20.05	10.13%	\$197.82	19.73%	5.29%	14.44%	\$29	\$97.33
2034	\$1,101.99	\$826.20	75.0%	\$275.79	\$18.69	9.56%	\$20.11	9.87%	\$203.82	19.43%	5.28%	14.15%	\$29	\$96.95

The assumptions, except where stated otherwise are the same as those used in the June 30, 2014 report.

All dollar amounts in millions

5% contribution rate for members hired prior to 7/1/2006

6.75% contribution rate for members hired after 6/30/2006 and before 7/1/2011

5.25% contribution rate for members hired after to 6/30/2011

**Tucson Supplemental Retirement System
Open Group Projection as of June 30, 2014**

Appendix III

Current Board Funding Policy (Twenty-year Level Percent of Pay Open Amortization but with Roundup and 27.5% Minimum)

Valuation Year	Actuarial Accrued Liability	Actuarial Value of Assets	Funded Ratio	Unfunded Accrued Liability (UAL)	Normal Cost (\$ amount)	Normal Cost (% of pay)	20-Year Amortization of the UAL	UAL (% of pay)	Covered Payroll	Total Computed Contribution	Combined Member Financed Portion	City Financed Portion	City Financed Portion in Dollars	Expected Benefit Payments
2014	\$1,012.39	\$656.00	64.8%	\$356.40	\$14.02	11.71%	\$25.99	20.52%	\$126.64	32.78%	5.28%	27.50%	\$35	\$67.46
2015	\$1,030.88	\$711.13	69.0%	\$319.74	\$13.95	11.51%	\$23.31	18.25%	\$127.77	32.79%	5.29%	27.50%	\$35	\$70.69
2016	\$1,047.27	\$750.03	71.6%	\$297.23	\$13.94	11.35%	\$21.67	16.74%	\$129.50	32.79%	5.29%	27.50%	\$36	\$73.61
2017	\$1,061.81	\$795.60	74.9%	\$266.21	\$13.97	11.19%	\$19.41	14.75%	\$131.63	32.80%	5.30%	27.50%	\$36	\$76.36
2018	\$1,074.59	\$833.31	77.5%	\$241.28	\$14.02	11.04%	\$17.59	13.14%	\$133.90	32.80%	5.30%	27.50%	\$37	\$79.06
2019	\$1,085.55	\$856.43	78.9%	\$229.12	\$14.10	10.89%	\$16.71	12.24%	\$136.48	32.81%	5.31%	27.50%	\$38	\$81.80
2020	\$1,094.55	\$879.24	80.3%	\$215.30	\$14.22	10.75%	\$15.70	11.28%	\$139.21	32.81%	5.31%	27.50%	\$38	\$84.25
2021	\$1,101.77	\$902.09	81.9%	\$199.68	\$14.38	10.62%	\$14.56	10.23%	\$142.32	32.82%	5.32%	27.50%	\$39	\$86.32
2022	\$1,107.53	\$925.47	83.6%	\$182.05	\$14.56	10.50%	\$13.27	9.11%	\$145.73	32.82%	5.32%	27.50%	\$40	\$88.21
2023	\$1,111.93	\$949.73	85.4%	\$162.20	\$14.77	10.38%	\$11.83	7.92%	\$149.37	32.82%	5.32%	27.50%	\$41	\$90.08
2024	\$1,114.93	\$975.02	87.5%	\$139.91	\$15.00	10.27%	\$10.20	6.66%	\$153.26	32.82%	5.32%	27.50%	\$42	\$91.75
2025	\$1,116.66	\$1,001.71	89.7%	\$114.95	\$15.26	10.17%	\$8.38	5.33%	\$157.36	32.82%	5.32%	27.50%	\$43	\$93.24
2026	\$1,117.23	\$1,030.15	92.2%	\$87.07	\$15.54	10.08%	\$6.35	3.93%	\$161.65	32.82%	5.32%	27.50%	\$44	\$94.48
2027	\$1,116.83	\$1,060.80	95.0%	\$56.04	\$15.85	9.99%	\$4.09	2.46%	\$166.19	32.82%	5.32%	27.50%	\$46	\$95.64
2028	\$1,115.52	\$1,093.96	98.1%	\$21.55	\$16.18	9.90%	\$1.57	0.92%	\$170.96	32.81%	5.31%	27.50%	\$47	\$96.57
2029	\$1,113.48	\$1,130.15	101.5%	-\$16.67	\$16.54	9.83%	(\$1.22)	-0.69%	\$175.91	32.81%	5.31%	27.50%	\$48	\$97.20

The assumptions, except where stated otherwise are the same as those used in the June 30, 2014 report.

All dollar amounts in millions

5% contribution rate for members hired prior to 7/1/2006

6.75% contribution rate for members hired after 6/30/2006 and before 7/1/2011

5.25% contribution rate for members hired after to 6/30/2011

27.5% city financed portion

**TUCSON SUPPLEMENTAL RETIREMENT SYSTEM
BOARD OF TRUSTEES**

Notice of Regular Meeting / Agenda

DATE: Friday, October 31st, 2014

TIME: 8:00 am

PLACE: Arizona Inn – (Safari Room) 2200 East Elm Street, Tucson, AZ

Please Note: Legal action may be taken on any item listed on this agenda

Arizona Inn - Telephone: (520) 325-1541, Fax: (520) 881-5830 Directions: heading eastbound on Speedway from the intersection of Speedway and Stone, turn left (north) at Campbell, and continue to Elm Street, taking a right turn (east) onto Elm Street. Located in a residential zone on the right, approximately 3/10th's of a mile from Campbell (parking area will be to your left, directly in front of the Arizona Inn, on the left side of Elm Street).

Morning Agenda (call to order by 8:00am)

1) Consent Agenda

- a. Approval of September 25, 2014 TSRS Board meeting minutes
- b. September 2014 TSRS Financials
- c. Retirement ratifications for the month of October, 2014

2) Actuary Valuation Report for June 30, 2014 – Gabriel Roeder Smith & Assoc., - Leslie Thompson

- a. Actuary's presentation of June 30, 2014 TSRS valuation report
- b. Discussion of TSRS Funding Policy Draft – Cassie Langford
- c. Recommended contribution rates for FY16 (July 1, 2015 - June 30, 2016)
- d. Acceptance of 6/30/14 Valuation Report, Formal adoption of TSRS Funding Policy, Formal Recommendation of FY16 contribution rates
- e. TSRS Valuation Report Draft for the plan year ended June 30, 2014

3) PIMCO – Rick Fulford, Sasha Talcott

- a. Discussion of Bill Gross departure from PIMCO
- b. Annual Fund Manager Review of Custom Fixed Income Fund
- c. Annual Fund Manager Review of Stocks Plus Fund
- d. Current Economic Overview and Forecast

15 minute Morning Break (estimated at 10:05am)

4) JP Morgan – Darren Smith, Mia Dennis, Dick Oswald

- a. Annual Fund Manager Review of Strategic Property Fund
- b. Annual Fund Manager Review of US Income & Growth Fund
- c. Introduction to Non-US Fixed Income Investments

5) Lunch

Lunch Break (estimated time - 12:00pm to 1:15pm)

**TUCSON SUPPLEMENTAL RETIREMENT SYSTEM
BOARD OF TRUSTEES
Notice of Regular Meeting / Agenda
DATE: Friday, October 31st, 2014**

Reconvene at 1:15pm

6) Investment Activity / Status Report

- a. TSRS portfolio composition, transactions and individual investments, securities lending summary and performance by manager for the quarter ending 9/30/14
- b. **Callan Associates – Paul Erlendson, Gordon Weightman** – ^{Note 1} Executive Summary of TSRS Performance for 9/30/2014

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**15 minute Afternoon Break (estimated at 2:05pm)**  
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7) Callan Associates - Paul Erlendson, Gordon Weightman

- a. Discussion of International Small Cap Equity Manager Search
- b. Evaluation of Causeway's ACWI-Ex US Strategy

8) Administrative Discussions – Cassie Langford

- a. ^{Note 1} Board Governance Policy – General Meeting Matters
- b. ^{Note 1} Board Governance Policy - Conflict of Interest Policy

9) Articles for Board Member Education / Discussion

- a. Callan Memorandum: Bill Gross resigns from PIMCO (October 1, 2014 Callan Associates Fixed Income Global Manager Research Team, Paul Erlendson, Gordie Weightman)

10) Call to Audience

11) Future Agenda Items

12) Adjournment

Note 1 – This item was not available when this information was distributed; therefore, the information will be distributed during the meeting.

*Pursuant to ARS 38-431.03(A)(3) and (4): the board may hold an executive session for the purposes of obtaining legal advice from an attorney or attorneys for the Board or to consider its position and instruct its attorney(s) in pending or contemplated litigation. The board may also hold an executive session pursuant to A.R.S. 38-431.03(A)(2) for purposes of discussion or consideration of records, information or testimony exempt by law from public inspection.

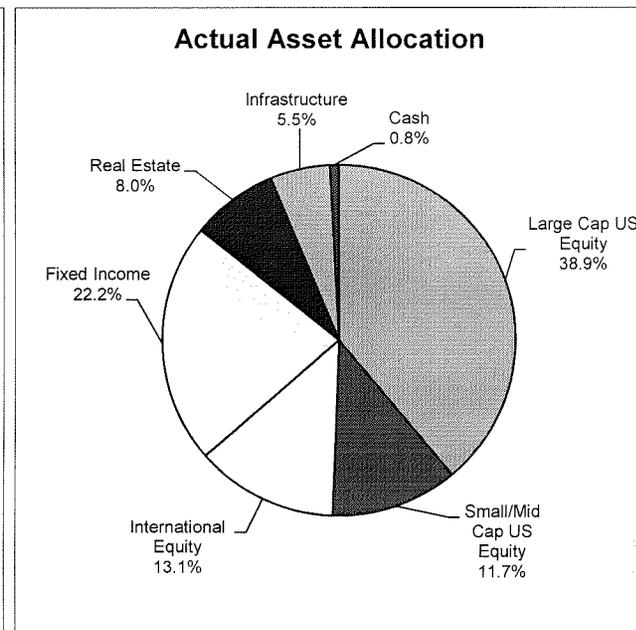
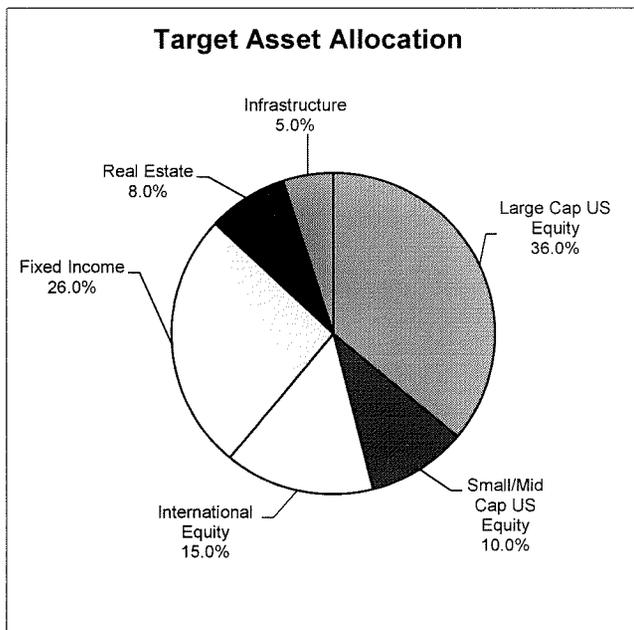
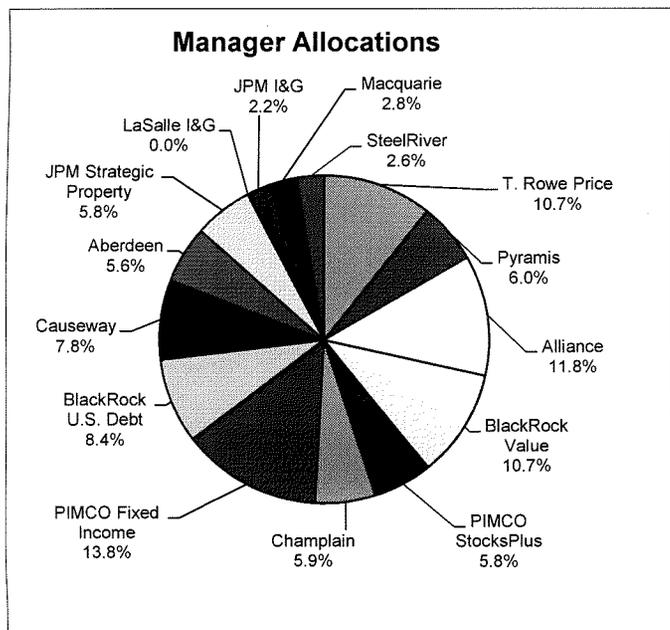
Manager Allocations Compared with Policy Levels

Monthly Report as of: 06/30/15

<i>Managers and Asset Class</i>	<i>Actual</i>		<i>Target</i>		<i>Differences</i>		<i>Range</i>		<i>Outside Range</i>
	<i>(000s)</i>	<i>%</i>	<i>(000s)</i>	<i>%</i>	<i>From Target</i>		<i>Min</i>	<i>Max</i>	
T. Rowe Price	\$ 78,820	10.7%	\$ 73,547	10.0%	0.7%	\$ 5,274	8.0%	12.0%	0.0%
Alliance (S&P 500)	86,801	11.8%	80,901	11.0%	0.8%	5,900	8.0%	14.0%	0.0%
BlackRock Value	78,628	10.7%	73,547	10.0%	0.7%	5,081	8.0%	12.0%	0.0%
PIMCO StocksPlus	42,899	5.8%	36,773	5.0%	0.8%	6,126	3.0%	7.0%	0.0%
Large Cap U.S. Equity	287,149	39.0%	264,768	36.0%	3.0%	22,381	31.0%	41.0%	0.0%
Pyramis	43,895	6.0%	36,773	5.0%	1.0%	7,121	3.0%	7.0%	0.0%
Champlain	43,140	5.9%	36,773	5.0%	0.9%	6,367	3.0%	7.0%	0.0%
Small/Mid Cap U.S. Equity	87,035	11.9%	73,547	10.0%	1.9%	13,488	6.0%	14.0%	0.0%
Causeway Capital Mgmt	57,596	7.8%	55,160	7.5%	0.3%	2,436	5.5%	9.5%	0.0%
Aberdeen Asset Mgmt	41,264	5.6%	55,160	7.5%	-1.9%	(13,896)	5.5%	9.5%	0.0%
International Equity	98,860	13.4%	110,320	15.0%	-1.6%	(11,460)	13.0%	17.0%	0.0%
Total Stocks	473,044	64.3%	448,635	61.0%	3.3%	24,409	56.0%	66.0%	0.0%
PIMCO Fixed Income	101,499	13.8%	117,675	16.0%	-2.2%	(16,176)	13.0%	19.0%	0.0%
BlackRock U.S. Debt	61,449	8.4%	73,547	10.0%	-1.6%	(12,098)	8.0%	12.0%	0.0%
Total Bonds	162,948	22.2%	191,221	26.0%	-3.8%	(28,274)	21.0%	31.0%	0.0%
JPM Strategic Property	42,273	5.7%	36,773	5.0%	0.7%	5,499	3.0%	7.0%	0.0%
LaSalle Income & Growth IV	62	0.0%	11,032	1.5%	-1.5%	(10,970)	0.0%	3.0%	0.0%
JPM Income & Growth	16,427	2.2%	11,032	1.5%	0.7%	5,395	0.0%	3.0%	0.0%
Total Real Estate	58,761	7.9%	58,837	8.0%	-0.1%	(76)	6.0%	10.0%	0.0%
Macquarie	20,840	2.8%	18,387	2.5%	0.3%	2,453	1.5%	3.5%	0.0%
SteelRiver	19,381	2.6%	18,387	2.5%	0.1%	994	1.5%	3.5%	0.0%
Total Infrastructure	40,220	5.4%	36,773	5.0%	0.4%	3,447	3.0%	7.0%	0.0%
Liquidity Fund	493	0.1%	-						
Total Fund	\$ 735,467	100%	\$ 735,467	100%					

Allocation Summaries

As of: 06/30/15



Investment Manager Allocation:

<u>Investment Account</u>	<u>(000s)</u>
1 T. Rowe Price	\$ 78,820
2 Pyramis	43,895
3 Alliance	86,801
4 BlackRock Value	78,628
5 PIMCO StocksPlus	42,899
6 Champlain	43,140
7 PIMCO Fixed Income	101,499
8 BlackRock U.S. Debt	61,449
9 Causeway	57,596
10 Aberdeen	41,264
11 JPM Strategic Property	42,273
12 LaSalle I&G	62
13 JPM I&G	16,427
14 Macquarie	20,840
15 SteelRiver	19,381
Liquidity Account	493
Total Assets	\$ 735,467

Target Asset Allocation:

<u>Asset Class</u>	<u>(000s)</u>
Large Cap US Equity	264,768
Small/Mid Cap US Equity	73,547
International Equity	110,320
Fixed Income	191,221
Real Estate	58,837
Infrastructure	36,773
Total Assets	\$ 735,467

Actual Asset Allocation:

<u>Asset Class</u>	<u>(000s)</u>
Large Cap US Equity	285,799
Small/Mid Cap US Equity	85,796
International Equity	96,076
Fixed Income	162,948
Real Estate	58,761
Infrastructure	40,220
Cash	5,866
Total Assets	\$ 735,467

**TUCSON SUPPLEMENTAL RETIREMENT SYSTEM
CALENDAR YEAR 2015 PERFORMANCE BY MANAGER
NET OF FEES AND CUSTODIAL CHARGES**

	Total Fund	BlackRock U.S. Debt	PIMCO	Total Fixed	Alliance S&P 500	BlackRock Value	PIMCO StocksPlus	T.RowePrice	Pyramis	Champlain	Aberdeen	Causeway Capital	Total Equities	JP Morgan Strat Prop	LaSalle I & G	JP Morgan I & G	Total Real Estate	SteelRiver	Macquarie Capital	Total Infrastructure
JAN	-1.02%	2.10%	1.67%	1.83%	-3.00%	-3.97%	-2.78%	-0.58%	-2.39%	-2.76%	-0.48%	0.53%	-2.02%	0.47%	0.00%	3.00%	1.14%	0.00%	-6.70%	-3.58%
FEB	3.76%	-0.92%	0.76%	0.12%	5.73%	4.86%	5.92%	6.73%	6.88%	5.94%	4.26%	4.42%	5.60%	1.85%	0.00%	0.00%	1.32%	-0.20%	2.16%	1.02%
MAR	-0.57%	0.44%	0.33%	0.37%	-1.58%	-1.37%	-1.46%	-0.55%	1.43%	0.83%	-2.74%	-1.12%	-0.93%	1.35%	2.61%	0.00%	1.00%	0.00%	-4.25%	-2.22%
APR	1.14%	-0.29%	0.20%	0.02%	0.95%	0.94%	0.77%	0.09%	-1.32%	1.02%	4.82%	4.89%	1.39%	0.90%	0.00%	3.36%	1.55%	0.00%	4.33%	2.22%
MAY	0.70%	-0.29%	0.12%	-0.03%	1.29%	1.21%	1.38%	2.03%	3.79%	1.47%	-2.01%	-1.14%	1.05%	1.02%	0.00%	0.00%	0.73%	1.47%	-2.16%	-0.43%
JUN	-1.08%	-1.10%	-1.77%	-1.52%	-1.92%	-1.93%	-2.11%	-1.20%	1.19%	0.06%	-4.19%	-2.71%	-1.66%	1.49%	24.40%	4.95%	2.45%	1.66%	3.61%	2.66%
JUL	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AUG	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SEP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OCT	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NOV	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DEC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CYTD	2.88%	-0.09%	1.28%	0.76%	1.23%	-0.49%	1.48%	6.47%	9.67%	6.54%	-0.69%	4.72%	3.28%	7.29%	27.65%	11.73%	8.47%	2.95%	-3.48%	-0.48%

Benchmark Returns:																				
Latest Month	-1.44%	-1.09%	-1.42%	-1.09%	-1.94%	-2.00%	-1.94%	-1.76%	0.75%	-2.07%	-2.79%	-2.83%	-1.92%	-	-	-	-	0.68%	0.68%	0.68%
Cldr Yr to Date	2.05%	-0.10%	0.97%	-0.10%	1.24%	-0.62%	1.24%	3.97%	4.75%	2.35%	4.03%	5.53%	2.66%	3.39%	3.39%	3.39%	3.39%	3.64%	3.64%	3.64%
Index	Custom Plan Index	Barclays Aggregate	Fixed Inc Custom	Barclays Aggregate	S & P 500	Russell 1000 Value	S & P 500	Russell 1000 Growth	Russell 2000	Russell Midcap	MSCI All Country Wld x-US N	MSCI EAFE Net Divd	Equity Composite	NCREIF-ODCE (1)	NCREIF-ODCE (1)	NCREIF-ODCE (1)	NCREIF-ODCE (1)	CPI + 4% (2)	CPI + 4% (2)	CPI + 4% (2)

(1) CYTD Index returns thru: 03/31/15

(2) CYTD Index returns thru: 06/30/15

**TUCSON SUPPLEMENTAL RETIREMENT SYSTEM
CALENDAR YEAR 2015 PERFORMANCE BY QUARTER
NET OF FEES AND CUSTODIAL CHARGES**

ACCOUNT & BENCHMARK	1st Quarter Ending 3/31/15	2nd Quarter Ending 6/30/15	3rd Quarter Ending 9/30/15	4th Quarter Ending 12/31/15	TOTAL TO DATE
TOTAL FUND	2.12%	0.75%	0.00%	0.00%	2.88%
CUSTOM PLAN INDEX	2.22%	-0.17%	0.00%	0.00%	2.05%
BLACKROCK U.S. DEBT INDEX	1.61%	-1.67%	0.00%	0.00%	-0.09%
BARCLAYS CAPITAL AGGREGATE	1.61%	-1.68%	0.00%	0.00%	-0.10%
PIMCO FIXED INCOME	2.78%	-1.46%	0.00%	0.00%	1.28%
FIXED INCOME CUSTOM INDEX	1.97%	-0.98%	0.00%	0.00%	0.97%
TOTAL FIXED	2.33%	-1.53%	0.00%	0.00%	0.76%
BARCLAYS CAPITAL AGGREGATE	1.61%	-1.68%	0.00%	0.00%	-0.10%
ALLIANCE S&P INDEX	0.94%	0.29%	0.00%	0.00%	1.23%
S&P 500	0.96%	0.28%	0.00%	0.00%	1.24%
BLACKROCK VALUE	-0.68%	0.19%	0.00%	0.00%	-0.49%
RUSSELL 1000 VALUE	-0.72%	0.10%	0.00%	0.00%	-0.62%
PIMCO STOCKS PLUS	1.47%	0.01%	0.00%	0.00%	1.48%
S&P 500	0.96%	0.28%	0.00%	0.00%	1.24%
T. ROWE PRICE	5.53%	0.90%	0.00%	0.00%	6.47%
RUSSELL 1000 GROWTH	3.84%	0.12%	0.00%	0.00%	3.97%
PYRAMIS (FIDELITY)	5.82%	3.64%	0.00%	0.00%	9.67%
RUSSELL 2000	4.31%	0.42%	0.00%	0.00%	4.75%
CHAMPLAIN	3.87%	2.57%	0.00%	0.00%	6.54%
RUSSELL MIDCAP	3.96%	-1.54%	0.00%	0.00%	2.35%
ABERDEEN	0.92%	-1.59%	0.00%	0.00%	-0.69%
MSCI AC WORLD EX U.S. - Net Divd	3.49%	0.53%	0.00%	0.00%	4.03%
CAUSEWAY	3.80%	0.88%	0.00%	0.00%	4.72%
MSCI EAFE - Net Divd	4.88%	0.62%	0.00%	0.00%	5.53%
TOTAL EQUITIES	2.50%	0.75%	0.00%	0.00%	3.28%
EQUITY COMPOSITE	2.47%	0.19%	0.00%	0.00%	2.66%
JP MORGAN STRAT PROP	3.71%	3.45%	0.00%	0.00%	7.29%
NCREIF PROP-ODCE (Est.)	3.39%	0.00%	0.00%	0.00%	3.39%
LASALLE I & G	2.61%	24.40%	0.00%	0.00%	27.65%
NCREIF PROP-ODCE (Est.)	3.39%	0.00%	0.00%	0.00%	3.39%
JP MORGAN I & G	3.00%	8.48%	0.00%	0.00%	11.73%
NCREIF PROP-ODCE (Est.)	3.39%	0.00%	0.00%	0.00%	3.39%
TOTAL REAL ESTATE	3.50%	4.80%	0.00%	0.00%	8.47%
NCREIF PROP-ODCE (Est.)	3.39%	0.00%	0.00%	0.00%	3.39%
STEELRIVER	-0.20%	3.15%	0.00%	0.00%	2.95%
CPI + 4%	1.54%	2.06%	0.00%	0.00%	3.64%
MACQUARIE CAPITAL	-8.74%	5.76%	0.00%	0.00%	-3.48%
CPI + 4%	1.54%	2.06%	0.00%	0.00%	3.64%
TOTAL INFRASTRUCTURE	-4.76%	4.49%	0.00%	0.00%	-0.48%
CPI + 4%	1.54%	2.06%	0.00%	0.00%	3.64%

**TUCSON SUPPLEMENTAL RETIREMENT SYSTEM
FISCAL YEAR 2015 PERFORMANCE BY MANAGER
NET OF FEES AND CUSTODIAL CHARGES**

	Total Fund	BlackRock U.S. Debt	PIMCO	Total Fixed	Alliance S&P 500	BlackRock Value	PIMCO StocksPlus	T.RowePrice	Pyramis	Champlain	Aberdeen	Causeway Capital	Total Equities	JP Morgan Strat Prop	LaSalle I & G	JP Morgan I & G	Total Real Estate	SteelRiver	Macquarie Capital	Total Infrastructure
JUL	-1.37%	-0.23%	-1.08%	-0.77%	-1.34%	-1.66%	-1.43%	-0.99%	-4.64%	-3.03%	-0.53%	-2.04%	-1.78%	0.26%	0.00%	0.00%	0.18%	0.00%	-2.23%	-1.24%
AUG	2.37%	1.08%	1.14%	1.12%	3.97%	3.67%	4.09%	3.26%	5.02%	3.94%	1.18%	1.01%	3.25%	0.78%	-1.01%	0.00%	0.50%	0.00%	0.25%	0.14%
SEP	-1.87%	-0.62%	-1.43%	-1.13%	-1.39%	-2.02%	-1.27%	-1.60%	-4.80%	-2.79%	-4.88%	-2.38%	-2.40%	1.06%	0.00%	0.00%	0.76%	0.00%	-4.10%	-2.27%
OCT	1.46%	0.93%	1.22%	1.11%	2.42%	2.25%	2.15%	3.56%	5.12%	3.30%	-1.75%	-2.26%	1.87%	-0.06%	0.00%	2.70%	0.68%	0.00%	-0.78%	-0.42%
NOV	1.47%	0.72%	0.18%	0.38%	2.69%	2.08%	2.86%	2.01%	1.34%	2.32%	-0.65%	1.37%	1.87%	0.97%	-3.74%	0.00%	0.64%	2.50%	2.40%	2.45%
DEC	-0.68%	0.15%	-1.34%	-0.78%	-0.24%	0.59%	-0.43%	-1.01%	2.55%	-0.99%	-3.97%	-3.28%	-0.79%	1.57%	0.00%	0.00%	1.12%	0.00%	-2.94%	-1.58%
JAN	-1.02%	2.10%	1.67%	1.83%	-3.00%	-3.97%	-2.78%	-0.58%	-2.39%	-2.76%	-0.48%	0.53%	-2.02%	0.47%	0.00%	3.00%	1.14%	0.00%	-6.70%	-3.58%
FEB	3.76%	-0.92%	0.76%	0.12%	5.73%	4.86%	5.92%	6.73%	6.88%	5.94%	4.26%	4.42%	5.60%	1.85%	0.00%	0.00%	1.32%	-0.20%	2.16%	1.02%
MAR	-0.57%	0.44%	0.33%	0.37%	-1.58%	-1.37%	-1.46%	-0.55%	1.43%	0.83%	-2.74%	-1.12%	-0.93%	1.35%	2.61%	0.00%	1.00%	0.00%	-4.25%	-2.22%
APR	1.14%	-0.29%	0.20%	0.02%	0.95%	0.94%	0.77%	0.09%	-1.32%	1.02%	4.82%	4.89%	1.39%	0.90%	0.00%	3.36%	1.55%	0.00%	4.33%	2.22%
MAY	0.70%	-0.29%	0.12%	-0.03%	1.29%	1.21%	1.38%	2.03%	3.79%	1.47%	-2.01%	-1.14%	1.05%	1.02%	0.00%	0.00%	0.73%	1.47%	-2.16%	-0.43%
JUN	-1.08%	-1.10%	-1.77%	-1.52%	-1.92%	-1.93%	-2.11%	-1.20%	1.19%	0.06%	-4.19%	-2.71%	-1.66%	1.49%	24.40%	4.95%	2.45%	1.66%	3.61%	2.66%
FYTD	4.23%	1.94%	-0.07%	0.67%	7.44%	4.36%	7.54%	12.01%	14.22%	9.24%	-10.88%	-3.07%	5.24%	12.28%	21.63%	14.75%	12.74%	5.52%	-10.53%	-3.42%

Benchmark Returns:																				
Latest Month	-1.44%	-1.09%	-1.42%	-1.09%	-1.94%	-2.00%	-1.94%	-1.76%	0.75%	-2.07%	-2.79%	-2.83%	-1.92%	-	-	-	-	0.68%	0.68%	0.68%
Fiscal Yr to Date	4.07%	1.85%	0.34%	1.85%	7.43%	4.14%	7.43%	10.57%	6.48%	6.63%	-5.27%	-4.21%	4.26%	10.22%	10.22%	10.22%	10.22%	4.14%	4.14%	4.14%
Index	Custom Plan Index	Barclays Aggregate	Fixed Inc Custom	Barclays Aggregate	S & P 500	Russell 1000 Value	S & P 500	Russell 1000 Growth	Russell 2000	Russell Midcap	MSCI All Country Wld x-US N	MSCI EAFE Net Divd	Equity Composite	NCREIF - ODCE (1)	CPI + 4% (2)	CPI + 4% (2)	CPI + 4% (2)			

(1) FYTD Index returns thru: 03/31/15

(2) FYTD Index returns thru: 06/30/15

**TUCSON SUPPLEMENTAL RETIREMENT SYSTEM
ONE YEAR TO DATE PERFORMANCE BY MANAGER
NET OF FEES AND CUSTODIAL CHARGES**

	Total Fund	BlackRock U.S. Debt	PIMCO	Total Fixed	Alliance S&P 500	BlackRock Value	PIMCO StocksPlus	T.RowePrice	Pyramis	Champlain	Aberdeen	Causeway Capital	Total Equities	JP Morgan Strat Prop	LaSalle I & G	JP Morgan I & G	Total Real Estate	SteelRiver	Macquarie Capital	Total Infrastructure
JUL '14	-1.37%	-0.23%	-1.08%	-0.77%	-1.34%	-1.66%	-1.43%	-0.99%	-4.64%	-3.03%	-0.53%	-2.04%	-1.78%	0.26%	0.00%	0.00%	0.18%	0.00%	-2.23%	-1.24%
AUG '14	2.37%	1.08%	1.14%	1.12%	3.97%	3.67%	4.09%	3.26%	5.02%	3.94%	1.18%	1.01%	3.25%	0.78%	-1.01%	0.00%	0.50%	0.00%	0.25%	0.14%
SEP '14	-1.87%	-0.62%	-1.43%	-1.13%	-1.39%	-2.02%	-1.27%	-1.60%	-4.80%	-2.79%	-4.88%	-2.38%	-2.40%	1.06%	0.00%	0.00%	0.76%	0.00%	-4.10%	-2.27%
OCT '14	1.46%	0.93%	1.22%	1.11%	2.42%	2.25%	2.15%	3.56%	5.12%	3.30%	-1.75%	-2.26%	1.87%	-0.06%	0.00%	2.70%	0.68%	0.00%	-0.78%	-0.42%
NOV '14	1.47%	0.72%	0.18%	0.38%	2.69%	2.08%	2.86%	2.01%	1.34%	2.32%	-0.65%	1.37%	1.87%	0.97%	-3.74%	0.00%	0.64%	2.50%	2.40%	2.45%
DEC '14	-0.68%	0.15%	-1.34%	-0.78%	-0.24%	0.59%	-0.43%	-1.01%	2.55%	-0.99%	-3.97%	-3.28%	-0.79%	1.57%	0.00%	0.00%	1.12%	0.00%	-2.94%	-1.58%
JAN '15	-1.02%	2.10%	1.67%	1.83%	-3.00%	-3.97%	-2.78%	-0.58%	-2.39%	-2.76%	-0.48%	0.53%	-2.02%	0.47%	0.00%	3.00%	1.14%	0.00%	-6.70%	-3.58%
FEB '15	3.76%	-0.92%	0.76%	0.12%	5.73%	4.86%	5.92%	6.73%	6.88%	5.94%	4.26%	4.42%	5.60%	1.85%	0.00%	0.00%	1.32%	-0.20%	2.16%	1.02%
MAR '15	-0.57%	0.44%	0.33%	0.37%	-1.58%	-1.37%	-1.46%	-0.55%	1.43%	0.83%	-2.74%	-1.12%	-0.93%	1.35%	2.61%	0.00%	1.00%	0.00%	-4.25%	-2.22%
APR '15	1.14%	-0.29%	0.20%	0.02%	0.95%	0.94%	0.77%	0.09%	-1.32%	1.02%	4.82%	4.89%	1.39%	0.90%	0.00%	3.36%	1.55%	0.00%	4.33%	2.22%
MAY '15	0.70%	-0.29%	0.12%	-0.03%	1.29%	1.21%	1.38%	2.03%	3.79%	1.47%	-2.01%	-1.14%	1.05%	1.02%	0.00%	0.00%	0.73%	1.47%	-2.16%	-0.43%
JUN '15	-1.08%	-1.10%	-1.77%	-1.52%	-1.92%	-1.93%	-2.11%	-1.20%	1.19%	0.06%	-4.19%	-2.71%	-1.66%	1.49%	24.40%	4.95%	2.45%	1.66%	3.61%	2.66%
1-YTD	4.23%	1.94%	-0.07%	0.67%	7.44%	4.36%	7.54%	12.01%	14.22%	9.24%	-10.88%	-3.07%	5.24%	12.28%	21.63%	14.75%	12.74%	5.52%	-10.53%	-3.42%

Benchmark Returns:																				
Latest Month	-1.44%	-1.09%	-1.42%	-1.09%	-1.94%	-2.00%	-1.94%	-1.76%	0.75%	-2.07%	-2.79%	-2.83%	-1.92%	-	-	-	-	0.68%	0.68%	0.68%
One Yr to Date	4.07%	1.85%	0.34%	1.85%	7.43%	4.14%	7.43%	10.57%	6.48%	6.63%	-5.27%	-4.21%	4.26%	10.22%	10.22%	10.22%	10.22%	4.14%	4.14%	4.14%
Index	Custom Plan Index	Barclays Aggregate	Fixed Inc Custom	Barclays Aggregate	S & P 500	Russell 1000 Value	S & P 500	Russell 1000 Growth	Russell 2000	Russell Midcap	MSCI All Country Wld x-US N	MSCI EAFE Net Divd	Equity Composite	NCREIF - ODCE (1)	CPI + 4% (2)	CPI + 4% (2)	CPI + 4% (2)			

(1) One Yr Index returns thru: 03/31/15

(2) One Yr Index returns thru: 06/30/15

**Tucson Supplemental Retirement System (TSRS)
 BNY Mellon - Securities Lending & Custodial Fee Summary
 FY15**

July 1, 2014 - June 30, 2015

	Gross Earnings	Rebate Paid	Bank Fees	Gross Client Earnings	Administration Fee	FY15 Net Client Earnings	FY14 Net Client Earnings	FY15 Custodian Fees	FY14 Custodian Fees
July	\$ 1,592	\$ (9,766)	\$ 4,542	\$ 6,816	\$ -	\$ 6,816	\$ 5,410	\$ -	\$ -
August	1,548	(8,074)	3,848	5,775	-	5,775	5,938	-	-
September	1,816	(8,579)	4,156	6,239	-	6,239	4,605	73,879	80,368
October	1,670	(9,944)	4,644	6,970	-	6,970	4,719	-	-
November	1,711	(8,291)	3,999	6,002	-	6,002	5,198	-	-
December	2,087	(9,003)	4,434	6,655	-	6,655	5,814	71,675	92,075
January	2,418	(9,603)	4,807	7,214	-	7,214	6,299	-	-
February	2,722	(11,629)	5,739	8,612	-	8,612	5,150	-	-
March	3,484	(15,259)	7,496	11,248	-	11,248	6,457	75,962	86,251
April	3,886	(14,582)	7,386	11,082	-	11,082	7,613	-	-
May	3,894	(18,061)	8,781	13,175	-	13,175	14,978	-	-
June	3,652	(10,961)	5,844	8,769	-	8,769	7,267	-	49,951
Totals	\$ 30,481	\$ (133,752)	\$ 65,676	\$ 98,557	\$ -	\$ 98,557	\$ 79,447	\$ 221,516	\$ 308,645

cross check: 98,557

TSRS

Schedule of Cash Transfers Between Investment Accounts and/or Fund 072

FY 15

FROM (Transfers Out):				TO (Transfers In):			NOTES:
Transfer Date	Account #	Account Desc.	Amount	Account #	Account Desc.	Amount	
07/28/14	TSRF5001002	Macquarie Capital Infrastructure Fund	(10,934.65)	TSRF2001002	Liquidity Cash Account	10,934.65	Automatic transfer of excess cash to liquidity account
07/30/14	TSRF1003002	Alliance S&P 500 Account	(1,200,000.00)				
07/30/14	TSRF1005002	BlackRock Value	(1,200,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	2,400,000.00	To meet cash liquidity needs & rebalance portfolio
07/31/14	TSRF5002002	SteelRiver IFNA	(144,453.39)	TSRF2001002	Liquidity Cash Account	144,453.39	Automatic transfer of excess cash to liquidity account
08/12/14	TSRF4002002	LaSalle Income & Growth RE Fund IV	(716,756.86)	TSRF2001002	Liquidity Cash Account	716,756.86	Automatic transfer of excess cash to liquidity account
08/29/14	TSRF1009002	PIMCO StocksPlus	(2,200,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	2,200,000.00	To meet cash liquidity needs & rebalance portfolio
09/08/14	TSRF4002002	LaSalle Income & Growth RE Fund IV	(1,230,077.77)	TSRF2001002	Liquidity Cash Account	1,230,077.77	Automatic transfer of excess cash to liquidity account
09/23/14	TSRF5002002	SteelRiver IFNA	(36,659.32)	TSRF2001002	Liquidity Cash Account	36,659.32	Automatic transfer of excess cash to liquidity account
09/29/14	TSRF1005002	BlackRock Value	(2,000,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	2,000,000.00	To meet cash liquidity needs & rebalance portfolio
10/28/14	TSRF5001002	Macquarie Capital Infrastructure Fund	(10,277.33)	TSRF2001002	Liquidity Cash Account	10,277.33	Automatic transfer of excess cash to liquidity account
10/29/14	TSRF1010002	Champlain Investment Partners	(2,300,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	2,300,000.00	To meet cash liquidity needs & rebalance portfolio
10/31/14	TSRF5002002	SteelRiver IFNA	(128,449.58)	TSRF2001002	Liquidity Cash Account	128,449.58	Automatic transfer of excess cash to liquidity account
11/04/14	TSRF5001002	Macquarie Capital Infrastructure Fund	(583,367.61)	TSRF2001002	Liquidity Cash Account	583,367.61	Automatic transfer of excess cash to liquidity account
11/20/14	TSRF2001002	Liquidity Cash Account	(2,500,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	2,500,000.00	To meet cash liquidity needs & rebalance portfolio
12/17/14	TSRF5002002	SteelRiver IFNA	(354,736.94)	TSRF2001002	Liquidity Cash Account	354,736.94	Automatic transfer of excess cash to liquidity account
12/26/14	TSRF2001002	Liquidity Cash Account	(2,500,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	2,500,000.00	To meet cash liquidity needs & rebalance portfolio
01/27/15	TSRF5001002	Macquarie Capital Infrastructure Fund	(8,846.34)	TSRF2001002	Liquidity Cash Account	8,846.34	Automatic transfer of excess cash to liquidity account
01/29/15	TSRF1003002	Alliance S&P 500 Account	(2,000,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	2,000,000.00	To meet cash liquidity needs & rebalance portfolio
01/30/15	TSRF5002002	SteelRiver IFNA	(55,596.36)	TSRF2001002	Liquidity Cash Account	55,596.36	Automatic transfer of excess cash to liquidity account
02/26/15	TSRF1001202	T. Rowe Price	(1,500,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	1,500,000.00	To meet cash liquidity needs & rebalance portfolio
03/20/15	TSRF5002002	SteelRiver IFNA	(153,354.12)	TSRF2001002	Liquidity Cash Account	153,354.12	Automatic transfer of excess cash to liquidity account
03/27/15	TSRF1009002	PIMCO StocksPlus	(1,500,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	1,500,000.00	To meet cash liquidity needs & rebalance portfolio
04/29/15	TSRF1003002	Alliance S&P 500 Account	(1,500,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	1,500,000.00	To meet cash liquidity needs & rebalance portfolio
04/30/15	TSRF5002002	SteelRiver IFNA	(17,764.78)	TSRF2001002	Liquidity Cash Account	17,764.78	Automatic transfer of excess cash to liquidity account
05/05/15	TSRF5001002	Macquarie Capital Infrastructure Fund	(178,275.98)	TSRF2001002	Liquidity Cash Account	178,275.98	Automatic transfer of excess cash to liquidity account
05/11/15	TSRF5001002	Macquarie Capital Infrastructure Fund	(9,038.12)	TSRF2001002	Liquidity Cash Account	9,038.12	Automatic transfer of excess cash to liquidity account
05/22/15	TSRF4002002	LaSalle Income & Growth RE Fund IV	(648,156.36)	TSRF2001002	Liquidity Cash Account	648,156.36	Automatic transfer of excess cash to liquidity account
05/28/15	TSRF1001202	T. Rowe Price	(3,000,000.00)				
05/28/15	TSRF1002002	Pyramis Small Cap Account	(1,000,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	4,000,000.00	To meet cash liquidity needs & rebalance portfolio
06/26/15	TSRF1001202	T. Rowe Price	(2,000,000.00)				
06/26/15	TSRF1005002	BlackRock Value	(1,000,000.00)				
06/26/15	TSRF2001002	Liquidity Cash Account	(1,000,000.00)	FUND 072 (1)	INVESTMENT POOL ACCOUNT	4,000,000.00	To meet cash liquidity needs & rebalance portfolio
TOTALS			(32,686,745.51)			32,686,745.51	-

(1) - INVESTMENT POOL ACCOUNT (Fund 072) Transfer-In Summary:

FY15 -To Date	FY14	FY13	FY12	FY11	FY10	FY09	FY08	FY07	FY06	FY05	TOTAL
28,400,000	24,900,000	21,700,000	27,202,000	29,950,000	20,872,362	26,760,000	10,000,000	17,500,000	2,500,000	2,000,000	211,784,362
2,366,666.67	2,075,000	1,808,333	2,266,833	2,495,833	1,739,363	2,230,000	833,333	1,458,333	208,333	166,667	



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Still a Better Bang for the Buck

An Update on the Economic Efficiencies of Defined Benefit Pensions

by William B. Forna, FSA, and Nari Rhee, PhD

December 2014

ABOUT THE AUTHORS

William B. (Flick) Fornia is President of Pension Trustee Advisors, Inc., specializing in public sector retirement plans. He has 35 years of actuarial and consulting experience, primarily in the areas of retiree pension and healthcare benefits. Mr. Fornia is an author and frequent speaker on all aspects of retirement programs including financing, design and litigation. Mr. Fornia earned a Bachelor of Arts in Mathematics at Whitman College. He is a Fellow of the Society of Actuaries, Enrolled Actuary, Member of the American Academy of Actuaries, and Fellow of the Conference of Consulting Actuaries. He currently serves on the Faculty of the Society of Actuaries Fellowship Admissions Course, and the Conference of Consulting Actuaries Public Pensions Community Steering Committee.

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EXECUTIVE SUMMARY

Over the past three decades, private employers have shifted away from defined benefit (DB) pensions that provide employees with a steady retirement income stream, towards defined contribution (DC) retirement accounts—such as 401(k) plans—in which individual workers manage their own investments. Since the 2008 financial crisis, public employers have faced pressures to make a similar change.

However, DB plans are inherently more cost-efficient than DC plans. A seminal NIRS study released in 2008, entitled “A Better Bang for the Buck,” found that a typical large DB pension plan provides a given level of retirement benefit at about half the cost of a DC plan. In this updated comparison of DB and DC plan costs, we take into account key developments in the retirement benefits landscape with regard to fees, investment strategies, and annuities, while building an “apples to apples” comparison through a uniform set of demographic and economic assumptions. Highlights include the following:

1. A typical DB plan provides equivalent retirement benefits at about half the cost of a DC plan, and 29 percent lower cost than an “ideal” DC plan modeled with generous assumptions.

- A DB plan, modeled with the typical fees and asset allocation of a large public plan, has a 48 percent cost advantage compared to a typical individually directed DC plan.
- The DB pension costs 29 percent less than an “ideal” DC plan that features the same low fees and no individual investor deficiencies.
- Annuitizing DC account balances does not erase the DB pension cost advantage. Annuities offered by private insurance companies would only modestly decrease DC funding requirements at historical average interest rates, and would increase costs at 2014 interest rates.

2. DB plans have three structural cost advantages compared to DC plans: longevity risk pooling, the ability to maintain a well-diversified portfolio over a long investment horizon, and low fees and professional management.

- **Longevity risk pooling.** In order to provide lifelong income to each and every retiree, DB plans only have to fund benefits to last to average life expectancy. In a DC plan, an individual must accumulate extra funds in order to self-insure against the possibility of living longer than average. They can also buy a life annuity from an insurance company, but this comes at a cost.

- **Asset allocation.** DB pensions are able to maintain portfolio diversification—specifically, stay invested in equities—over time, while DC participants must shift to lower-risk, lower-return investments as they age. Thus over a lifetime, DB pensions earn higher gross investment returns than do DC accounts.

- **Low fees and professional management.** Due to economies of scale, DB plans feature low investment and administrative expenses as well as management of investments by professionals. An “ideal” DC plan can theoretically achieve the same fees and investment returns, for a given asset allocation, by removing individual choice. When we use more realistic assumptions—industry average fees and a modest “behavioral drag” on investment returns resulting from well-documented tendencies in individual investor behavior—we find that the DB plan has a large advantage in net investment returns.

3. Given the cost efficiencies inherent to DB plans, employers and policymakers should continue to carefully evaluate claims that “DC plans will save money.”

- For a given level of retirement income, a typical individually directed DC plan costs 91 percent more—almost twice as much—as a typical DB plan.
- Consequently, shifting from a DB plan to a DC plan and maintaining the same contribution rate will generate significant cuts in retirement income. The consequences could be dramatic for employees, employers, and taxpayers.

I. INTRODUCTION

Over the past three decades, private employers have shifted away from defined benefit (DB) pensions that provide employees with a steady retirement income stream, towards defined contribution (DC) retirement accounts—such as 401(k) plans—in which individual workers manage their own investments. By and large, public employers have faced growing pressure since the 2008 financial crisis to make a similar change. Contrary to popular belief, however, DC retirement accounts are not inherently less costly than a pension, and switching from a DB to a DC system saves money only if it involves substantial benefit cuts.

In fact, DB pensions feature critical efficiencies that make them significantly less expensive to provide a given level of retirement benefit compared to DC plans. This was documented by the National Institute on Retirement Security (NIRS) in its 2008 study, “A Better Bang for the Buck: The Economic Efficiencies of Defined Benefit Pensions.”¹ The study found that a typical large DB pension plan provides a given level of retirement benefit at about half the cost of a 401(k) style plan, because of three factors:

- The pooling of longevity risk in DB pensions enables them to fund benefits based on average life expectancy, and yet pay each worker monthly income no matter how long they live. In contrast, DC plans must receive excess contributions to enable each worker to self-insure against the possibility of living longer than average.
- DB pensions realize higher net investment returns due to professional management and lower fees from economies of scale.
- DB pensions are able to maintain portfolio diversification over time, while DC participants must shift to lower-risk, lower-return investments as they age. This means that over a lifetime, DB pensions earn higher gross investment returns than do DC accounts.

In summary, when it comes to providing retirement income, DB pensions are more efficient because they pool risks across a large number of individuals, invest over a longer time horizon, and have lower expenses and higher returns.

While these facts have not fundamentally changed since 2008, this study updates the comparison of retirement benefit funding costs based on an enhanced methodology that takes into account key changes in the DB and DC plan landscapes with regard to investment strategies and fees. We compare a typical large public sector DB pension to two kinds of DC plans—an individually directed DC plan with industry average fees and reduced investment returns based on typical investor behavior, and an “ideal” DC plan with fees well below industry average and asset class investment performance as strong as that achieved by professionals. Both DC plans are modeled with a target date fund (TDF) asset allocation pattern.

...a typical DB plan provides equivalent retirement benefits at about half the cost of a typical DC plan, and 29 percent lower cost than an ideal DC plan...

All three plans—the typical DB plan, the individually directed DC plan, and the ideal DC plan—are modeled with the same underlying demographic and economic assumptions regarding employee wage growth, retirement age, life expectancy, target monthly retirement income, inflation, and projected rates of return for each asset class. We also assume that all plans receive consistent, adequate contributions required to fund target benefits. In addition, we study the cost impact of annuitizing the account balances in the DC plans.

Even with updated assumptions and methodology, we still find that DB pensions offer substantial cost advantage over DC plans.

- A typical DB plan, with advantages based on longevity risk pooling, asset allocation, low fees, and professional management, has a 48 percent cost advantage compared to a typical individually directed DC plan.
- A DB pension costs 29 percent less than an “ideal” DC plan with below-average fees and no individual investor deficiencies.

- Annuitizing DC account balances—that is, converting the account balance at retirement into an insurance contract for lifetime income—does not erase the DB pension cost advantage. This is because insurance companies use a more conservative asset allocation and charge much higher fees than a DB pension. Annuities purchased at historical average interest rates only modestly decrease DC benefit costs, while annuities purchased at 2014 rates would increase benefit costs.

In other words, a typical DB plan provides equivalent retirement benefits at about half the cost of a typical DC plan,

and 29 percent lower cost than an ideal DC plan modeled with very generous assumptions.

Conversely, it would be 91 percent and 41 percent more expensive for an typical DC plan and an ideal DC plan, respectively, to deliver the same level of retirement income as a typical DB plan. Thus DB pensions continue to offer a significant cost advantage. While shifting from a DB pension to a DC plan offers a way to reduce the investment risk borne by employers and taxpayers, this comes with an unavoidable tradeoff—either increased benefit costs or, more likely, significant retirement benefit cuts that are larger than the savings realized by the employer.

II. DEFINED BENEFIT AND DEFINED CONTRIBUTION PLANS

Employers who offer retirement benefits can consider two basic approaches: a traditional defined benefit (DB) pension plan and a defined contribution (DC) retirement savings plan. The DB plan is designed to provide predictable retirement *income* throughout a worker's retirement years. Assets are pooled, and investments are managed by professionals who are responsible for acting in the best interest of participants. The DC plan, in contrast, is focused on accumulating retirement *wealth* expressed as a lump sum, with individual participants ultimately responsible for garnering adequate investment returns and managing their own accumulated wealth throughout their retirement years. This would entail estimating how much they can safely withdraw each year of retirement without running out of money, attempting to evaluate the best annuitization alternative in the open market, or some combination of the two.

Each type of plan has certain distinguishing characteristics that influence its cost to employers and employees.

How DB Plans Work

While employers have a large degree of flexibility in designing the features of a DB plan, there are some features all DB plans share. DB plans are designed to provide employees with a predictable monthly benefit in retirement. The amount of the monthly pension is typically a function of the number of years an employee devotes to the job and the worker's pay—usually at the end of their career.² For example, the plan might provide a benefit in the amount of 1.5 percent of final average pay for each year worked. Thus, a worker whose final average salary was \$50,000, and who had devoted 30 years to the job, would earn a monthly benefit of \$1,875 (\$22,500 per year), a sum that would “replace” 45 percent of her final average salary after she stops working. This plan design is attractive to employees because of the security it provides. Employees know in advance of making the decision to retire that they will have a steady, predictable income that will enable them to maintain a fairly stable and predictable portion of their pre-retirement standard of living.³

Benefits in DB plans are pre-funded. That is, employers (and, in the public sector, most employees) make contributions to

a common pension trust fund over the course of a worker's career. These funds are invested by professional asset managers whose activities are overseen by trustees and other fiduciaries. A typical DB pension fund's asset allocation policy—i.e., the share of holdings allotted to different asset classes such as stock, bonds, and treasuries—is based on a careful analysis of plan demographics and liabilities as well as short- and long-term financial market projections.⁴ The earnings that build up in the fund, along with the dollars initially contributed, pay for the lifetime benefits a worker receives when she retires.

How DC Plans Work

DC plans function very differently than do DB plans. First, there is no implicit or explicit promise of retirement income in a DC plan. Rather, the level of retirement income that an account will provide depends on a number of factors, such as the level of employer and employee contributions to the plan, the investment returns earned on assets, whether loans are taken or funds are withdrawn prior to retirement, and the individual's lifespan.

While DC plan assets are also held in a trust, that trust is comprised of a large number of individual accounts. DC plans are typically “participant directed,” meaning that each individual employee can decide how much to save, how to invest the funds in the account, how to modify these investments over time, and how to withdraw the funds during retirement.

Retirement experts typically advise individuals in DC plans to change their investment patterns over their lifecycle. In other words, at younger ages, because retirement is a long way off, workers should allocate more funds to stocks, which have higher expected returns but also higher risks. As one gets closer to retirement, experts suggest moving money away from stocks and into safer but lower return assets like bonds. This is to guard against a large drop in retirement savings on the eve of retirement, or in one's retirement years.

The high degree of participant direction makes DC plans very flexible in accommodating individuals' desires, decisions, and

control. Unfortunately, a substantial body of empirical and experimental research indicates that this flexibility tends to lead to adverse outcomes. First, too many workers fail to contribute sufficient amounts to the plans.⁵ Second, individuals' lack of expertise in making investment decisions can subject individual accounts to extremely unbalanced portfolios with too little or too much invested in one particular asset, such as stocks, bonds, or cash.⁶ One team of researchers thus concluded, "The likelihood of investment success increases as the participant's involvement in investment decisions decreases."⁷

Another important difference between DB and DC plans becomes apparent at retirement. Unlike in DB plans, where workers receive regular monthly pension payments, in DC plans it is typically left to the retiree to decide how to spend down their retirement savings. Research suggests that many individuals struggle with this task, either drawing down funds too quickly and running out of money, or holding on to funds too tightly and enjoying a lower standard of living as a result.⁸ In theory, employers that offer DC plans could provide annuity payout options, but in practice they rarely do.⁹

The Changing Retirement Benefit Landscape

Changing Asset Allocation and Risk Management Strategies among DB Pension Funds

Changes in the financial and regulatory environments for DB pensions over the last several years have prompted funds to shift financial risk management strategies. Notably, while governmental and corporate DB pension funds had similar asset allocations until 2008, including the share of investments in equities, different regulatory and demographic considerations led to diverging asset allocation after 2008.¹⁰ Given this divergence, and the concentration of DB pension benefits and assets in the governmental sector, this study models a typical public pension's asset allocation.¹¹

In the private sector, corporations began introducing 401(k) plans in the 1980s. Then in the early 21st century, many firms began to close or freeze existing DB pension plans. The long bull market in stocks from the 1980s to 2000 enabled corporate pension sponsors to either maintain pension plans with modest cash contributions or use their pensions as a source of income. Plan costs increased after the financial bubble burst. Then, after the passage of the Pension Protection Act of 2006, private

employers faced new pension funding rules. While intended to safeguard retirement benefits promised to private sector workers, these regulations made pension funding and reported liabilities more volatile which contributed to additional DB pension plan freezes and terminations.¹² Other accounting and regulatory actions over the decades have added to this trend.

With no new workers entering the system, closed corporate pension plans face a shorter investment horizon. This dynamic, combined with the pension expense volatility created by new funding and accounting rules, motivated many corporate DB pension sponsors to de-risk their portfolios by shifting from stocks to bonds and treasuries.¹³

Public pension plans, in particular state and local government pensions, also faced new challenges in the aftermath of the 2008 financial crisis. Almost every state legislature enacted plan changes to enhance sustainability, and most included measures to increase employee contributions and reduce benefits for at least some employees.¹⁴ Very few of these changes included eliminating the core DB plan.

Particularly germane to this study are the investment policy decisions made by many public pension funds. First, in response to a desire for reduced volatility and the low interest environment, pension fund trustees have reduced plan exposure to U.S. stocks and traditional fixed income securities, and further diversified funds by increasing the share of global stocks and alternative investments such as real estate, private equity, and commodities. Second, the changing financial landscape has also prompted many public pension funds to lower their rate of return assumptions. The asset-weighted median investment return assumption dropped from 8 percent in 2011 to 7.75 percent in 2014.¹⁵

Efforts to Improve DC Plans

The DC landscape has changed as well. Experts and policymakers have focused on addressing key problems in 401(k)-type plans related to fees, investment options, investor behavior, and retirement income outcomes.

An incremental decrease in fees has transpired due to increased regulatory scrutiny of 401(k) and IRA fees, and growing use of lower-cost index funds.¹⁶ The U.S. Department of Labor issued regulations in 2010 and 2012 concerning the disclosure of 401(k) fees. According to the Investment

Company Institute, the average 401(k) equity fund expense ratio, exclusive of fees paid by employers, declined from 77 basis points in 2000 to 58 basis points in 2013.¹⁷

Annuities have garnered increasing interest among policymakers and regulators as a way to convert DC account balances into a lifetime income stream. Individual investment accounts are framed in terms of lump-sum retirement *wealth*, while the challenge facing savers is securing adequate *income* to last through retirement. Annuities are financial products in which a third party (typically an insurance company) promises a stream of income in return for a lump sum. However, the availability of annuities as a 401(k) payout option is limited, and overall participation rates remain low. They tend to be expensive, due to today's low interest environment, insurer profit objectives, marketing and administrative costs, and adverse selection.

Growing use of target asset allocation funds. The consensus resulting from a decade of behavioral finance research is that 401(k) participants routinely make asset allocation and investment mistakes, such as buying and selling holdings at the wrong time, failing to regularly re-balance their portfolios, or taking too little or too much risk in their asset allocation. Target asset allocation funds address part of this problem through automatic re-balancing. One such type of fund, called Target Date Funds (TDFs) or lifecycle funds, has gained favor among policymakers, retirement experts, and large employers in the US.¹⁸ TDFs gradually and automatically shift their asset allocation from risky stocks to less risky bonds as a worker ages, based on their target retirement year. TDFs accounted

for 15 percent of 401(k) account balances, with heavier representation among younger workers, in 2013.¹⁹ These funds now account for the largest share of new 401(k) contributions. However, they are not a panacea for individual investor error, and most participants do not use TDFs as intended.²⁰

A Note on Hybrid Retirement Benefits

There is growing interest in “hybrid” retirement benefits that combine some of the features of DB and DC plans, and ostensibly offload some risks onto employees while maintaining some of the retirement security offered by traditional DB pensions. There are two main types. One type is a “side by side” or “stacked” hybrid, in which the core retirement benefit consists of a combination of a DB pension (typically with less generous benefits) and a DC plan. The other is a “blend” between DB and DC such as a cash balance (CB) plan. Under a CB plan, each employee has a notional account balance, as the employer credits each employee with a set percentage of her annual pay plus an interest rate that is either predetermined or tied to an index. A CB plan is legally a DB plan—benefits are guaranteed, albeit as a lump sum, and assets are pooled in a trust and managed professionally. However, CB plan benefits typically are less generous than a traditional DB pension, and generally participants do not obtain longevity protection.

Importantly, the relative costs of hybrid plans depend largely on benefit structure. To the extent that hybrid benefits emphasize DB-like characteristics, they can be more cost efficient. To the extent that they off-load risks onto individual workers, they will be less cost efficient.

III. METHODOLOGY

We compare the relative costs of DB and DC plans by constructing a model that first calculates the cost of achieving a target retirement benefit in a typical public sector DB plan. We calculate this cost as a level percent of payroll over a career. We then calculate the cost of providing the same retirement benefit under two different types of DC plans—an “ideal” DC plan modeled with generous assumptions and a more typical individually directed DC plan. Additional details on our methodology, and sensitivity analyses that account for the impact of alternative economic and demographic assumptions, can be found in the Technical Appendix to this report.

Demographic Assumptions

Our model is based on a group of 1,000 newly-hired employees. For the purposes of simplicity, we give all individuals a common set of features. All newly hired employees are female teachers aged 30 on the starting date of their employment. They work for three years and then take a two-year break from their careers for child rearing. They return to work at age 35 and continue working until age 62. Thus, the length of the career is 30 years. By their final year of work, their salary has reached \$60,000, having grown by 4 percent each year.²¹ For

modeling purposes, we assume that prior to retirement, no one dies, and there is no turnover within our pool of teachers.

Target Benefits

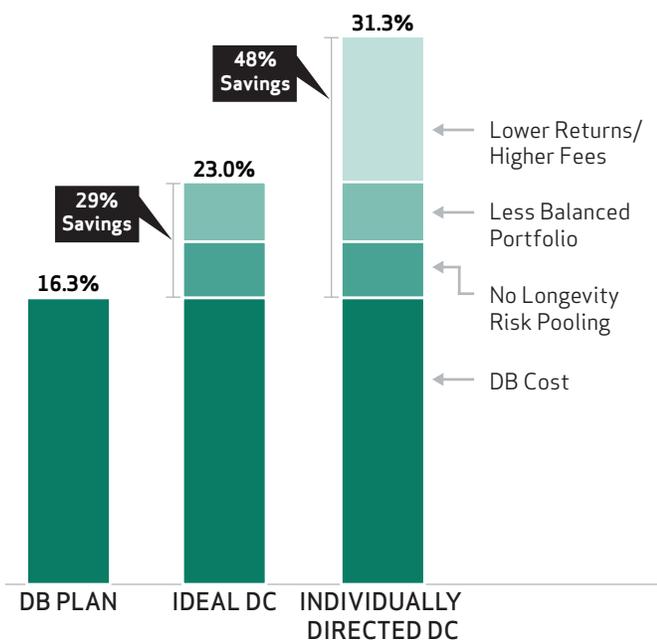
Next, we define a target retirement benefit that, combined with Social Security benefits, will allow our 1,000 teachers to achieve generally accepted standards of retirement income adequacy.²² The target benefit is \$32,036 per year or \$2,670 per month. A cost of living adjustment is provided to ensure the benefit maintains its purchasing power during retirement. Thus, each teacher will receive a benefit equal to 53 percent of her final year’s salary that adjusts with inflation, which we assume will be 3.0 percent per year. With this benefit and Social Security benefits, each teacher can expect to receive roughly 83 percent of her pre-retirement income—a level of retirement income that can be considered adequate, but not extravagant. We define certain parameters for life expectancy and investment returns. On the basis of all these inputs, we calculate the contribution—as a percentage of payroll—that will be required to fund our target retirement benefit through the DB plan over the course of a career. We do the same for the DC plans.

IV. FINDINGS: DB PLANS ARE STILL MORE COST EFFECTIVE

The cost of either a DB or DC plan depends, in the first instance, on the generosity of the benefits that it provides. However, for any given level of benefit, a DB plan will cost less than a DC plan. Conversely, on average a dollar invested in a DB plan will generate higher retirement income than a DC plan. *In other words, DB plans are more efficient.*

We find that the cost to fund the target retirement benefit under the DB plan comes to 16.3 percent of payroll each year. By comparison, we find that the cost to provide the same target retirement benefit is 31.3 percent of payroll under the individually directed DC plan and 23.0 percent under the ideal DC plan. As illustrated in **Figure 1**, the DB plan can provide the same benefit at a cost that is 48 percent lower than the individually directed DC plan and 29 percent lower than the ideal DC plan.

Figure 1:
Cost of DB and DC Plans as a Percentage of Payroll

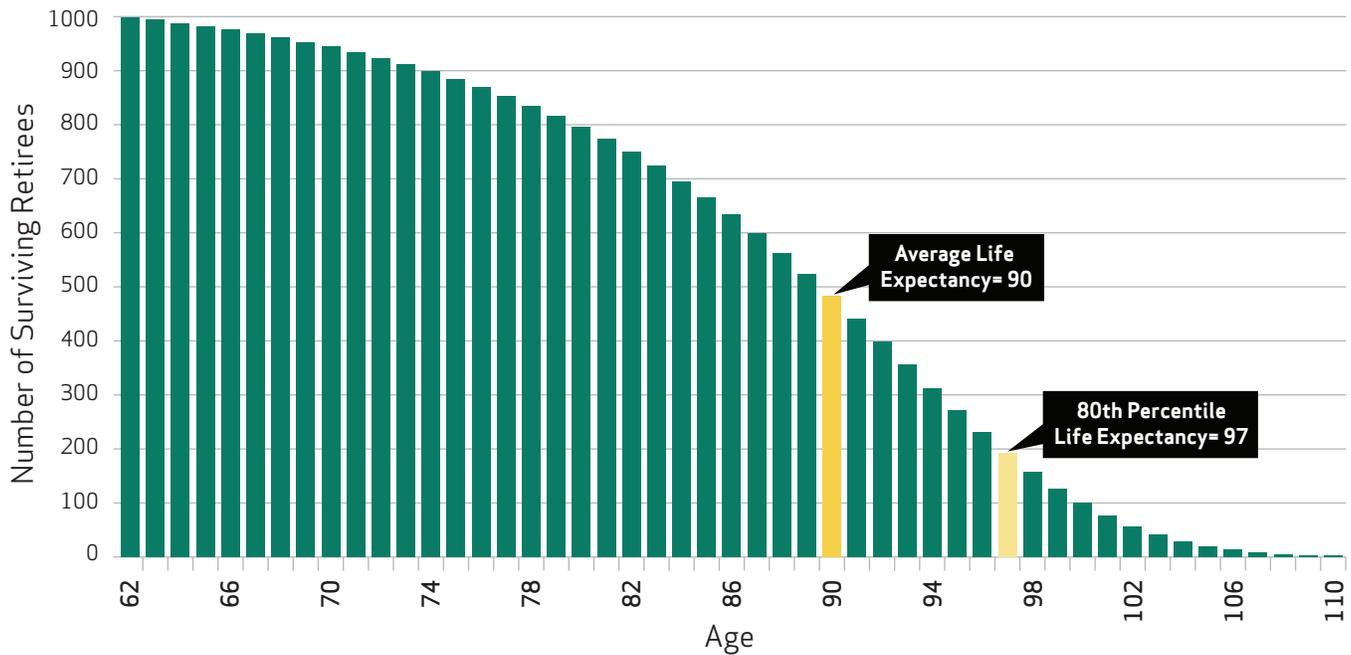


The DB cost advantage stems from differences in how benefits are paid out in each type of plan, how investment allocations shift in DC plans as individuals age, and how actual investment returns in DC plans compare with those in DB plans.

There are three primary reasons behind DB plans' cost advantage.

- First, because DB plans pool the longevity risks of a large number of individuals, these plans need only accumulate enough funds to provide benefits for the *average* life expectancy of the group. If individuals did this in a DC plan, they would face a 50 percent chance of running out of money in retirement. In order to reduce the risk of running out of funds to a reasonable level, individuals need to accumulate enough funds to last several years past average life expectancy. Even using only the 80th percentile life expectancy, which exposes participants to a one-in-five chance of running out of money, causes the DC plan to require significantly more funding.
- Second, because DB plans have a much longer investment horizon than individuals, they are able to take advantage of the enhanced investment returns that come from maintaining a balanced portfolio over a long period of time. The reason behind the longer investment horizon is that a mature DB plan has a mix of younger workers, older workers, and retirees, as younger workers continue to enter the plan. By contrast, individuals in DC plans must gradually shift to a more conservative asset allocation as they age, in order to protect against financial market shocks later in life. This means DB plans can ride out bear markets and keep a larger share of their investments in stocks and other assets that offer higher returns over the long term but fluctuate more in the short term compared to bonds and other fixed income securities. DB plans are also better positioned to take advantage of "illiquid" investments that offer premium returns—for instance, real estate and private equity. These factors allow DB pensions to ultimately earn higher gross returns based on asset allocation.

Figure 2: Longevity of 1,000 Retired Female Teachers



- Third, DB plans achieve even greater investment returns compared with typical individually directed DC plans based on lower fees and professional management. Superior returns can be attributed partly to lower fees that stem from economies of scale: assets are pooled in DB plans, where DC plans consist of individual accounts. In addition, because of professional management of assets, DB plans achieve superior investment performance compared to the average individual investor. DB investment managers have fiduciary duty and must meet the standard of prudence. In contrast, it is well-documented that individual investors make inappropriate decisions regarding both asset allocation and market timing—and thus tend to earn returns that lag behind market returns.²³ This effect is sometimes called “behavioral drag.”

Longevity Risk Pooling

Longevity risk describes the uncertainty an individual faces with respect to their exact lifespan. While actuaries can tell us that, on average, our pool of female teachers who are 30 today and who will retire at age 62 will live to be 90, they can also predict that some will live only a short time, and some will live to be over 100.²⁴ **Figure 2** illustrates the longevity patterns among our 1,000 teachers. With each passing year, fewer retirees are still living. Age 90 corresponds to the year when roughly half of retirees are still alive.

In a DB plan, the normal form of benefit is a lifetime annuity, that is, a series of monthly payments that lasts until death. A DB plan with a large number of participants can anticipate the fact that some individuals will live longer lives and others will live shorter lives. Thus, a DB plan needs only to ensure that it has enough assets set aside to pay for the average life expectancy of all individuals in the plan, or in this case, to age 90. Based on our target benefit level, the DB plan needs to have accumulated approximately \$500,000 for each participant in the plan by the time they turn 62. This amount is projected to be sufficient for every individual in the plan to receive a regular, inflation-adjusted monthly pension payment that lasts as long as they live. The contribution level required to fund this benefit over a career comes to 16.3 percent of payroll.

Total annual payments out of the DB plan will have a hump-shaped pattern as seen in **Figure 3**. The amount of benefits paid out will increase for a number of years, because the effect of inflation adjustments is greater than the effect of individuals gradually dying off. At age 82, the impact of retiree deaths overtakes the effect of the cost of living adjustments, and payments decline with each passing year. In the DB plan, every retiree receives a steady inflation-adjusted monthly income that lasts until her death.

Figure 3: Total Payments under the Defined Benefit Plan



Next, we contrast this situation with that in a DC plan. In the vast majority of cases, individuals must self-insure longevity risks (or purchase an annuity, as discussed below). This can be an expensive proposition.

Because an individual in a DC plan does not know exactly how long she will live, she will probably not be satisfied with a benefit sufficient to last only for the *average* life span, for if she lives past age 90, she will have depleted her retirement savings. For this reason, an individual will probably want to be sure that she has enough money saved to last for several years past average life expectancy.

We modeled the DC plan to provide income for the 80th percentile life expectancy, age 97. It corresponds to the age beyond which only 20 percent of individuals survive.²⁵ This is a conservative target. In fact, our mortality table indicates that it is likely that one lucky individual out of the 1,000 will celebrate her 111th birthday. It is not clear that most individuals will be satisfied with an 80 percent chance of not outliving their money, and in using this life expectancy, we understate the cost of the DC plan. **Figure 4** illustrates the payout pattern under the DC plan, where individuals withdraw funds on an equivalent basis to the DB plan until age 97—that is, in a series of regular, inflation-adjusted payments. After age 97, there are no more withdrawals. The money has simply run out.

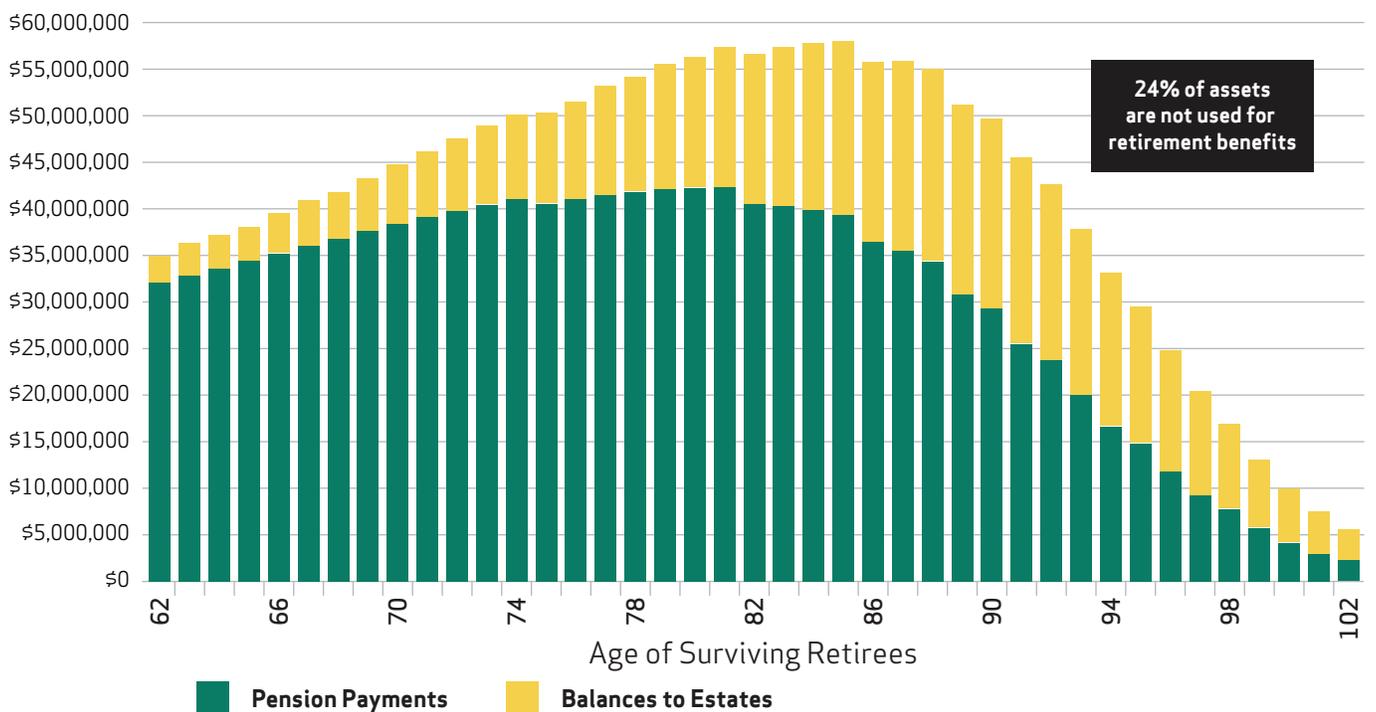
Of course, those 20 percent of individuals who do survive beyond age 97 would want to avoid the possibility of having their retirement income reduced to zero. It is likely that individuals will respond to longer lives by gradually reducing their withdrawals from the plan to avoid running out of money. This means that those with very long lives will see their standard of living reduced significantly. At the same time, because it is difficult to exactly predict one’s lifespan, some retirees who live past age 97 will reduce their withdrawals more than they actually need to. Finally, if a retiree dies before exhausting all of her retirement savings, the money in the account passes to her estate. The funds that were intended to be pension benefits become death benefits paid to heirs instead. **Figure 5** illustrates the combined effect of reduced withdrawals and estate payments.

The aggregate amount of money transferred to estates is substantial—totaling 24 percent of all assets accumulated in the plan in this illustration. While some individual heirs will benefit from these intergenerational transfers of wealth, such transfers are not economically efficient from a taxpayer or employer perspective. Because heirs did not provide services from which the employer/taxpayer benefited, providing additional benefits to heirs is economically inefficient. Moreover, these additional “death benefits” are not tied in any direct way to an individual employee’s productivity during her working years.

Figure 4: **Total Benefit Payments under the DC Plan Based on Life Expectancy of 97**



Figure 5: **Total Benefit and Estate Payments under the DC Plan Based on Adjusted Withdrawal Strategy**



In addition, although annuities purchased through private insurance companies may offer full protection against longevity risk, this protection comes at a significantly higher cost than the same protection provided by a DB pension. (See “Impact of Annuitizing DC Account Balances” on p.16.)

DB plans avoid this problem entirely. By pooling longevity risks, DB plans not only provide all participants in the plan with enough money to last a lifetime, but also accomplish this goal with less money than would be required in a DC plan. Because DB plans need to fund only the *average* life expectancy of the group, rather than the *maximum* life expectancy for all individuals in the plan, less money needs to be accumulated in the pension fund. Remember that the DB plan needs to accumulate about \$500,000 for each participant in the plan by the time they turn 62 in order to fund the target level of benefit. In contrast, DC plans must accumulate at least \$600,000 per participant, or nearly \$100,000 more, in order to minimize the likelihood of that individual running out of funds. This additional amount extends retirement income from average life expectancy to the 80th percentile life expectancy. **In order to accumulate the additional amount necessary for DC plan participants to self-insure against this level of longevity risk, contributions to the plan would climb to 19.6 percent of pay, from 16.3 percent under the DB plan** (an increase of 20 percent). This assumes the same net investment returns. However, as we demonstrate below, two remaining factors contribute to DC plans having inferior returns compared to the DB plan.

Maintenance of Portfolio Diversification (Staying Invested in Equities)

A retirement system that achieves higher investment returns can deliver a given level of benefit at a lower cost. All else being equal, the greater the level of investment earnings, the lower contributions to the plan will need to be.²⁶ Prior research substantiates DB plans’ significant advantage in investment returns, as compared with DC plans.

Part of the reason why DB plans tend to achieve higher investment returns as compared with DC plans is that they are long-lived. That is, unlike individuals, who have a finite career and a finite lifespan, a DB pension fund endures across generations; thus a DB plan, unlike the individuals in it, can maintain a well-diversified portfolio over time. This well-diversified portfolio will include investments which are expected to earn higher returns than a less diversified portfolio, which focuses on more secure but lower-returning asset classes.

In DC plans, individuals’ sensitivity to the risk of financial market shocks increases as they age. The consequences of a sharp stock market downturn on retirement assets when one is in their late 50s are substantial, compared to when one is in their 20s with sufficient time to recover their losses.

For this reason, individuals are advised to gradually shift away from higher risk/higher return assets as they approach retirement. While this shift offers insurance against the downside risk of a bear market, it also sacrifices expected returns since more money will be held in bonds, cash, and similar assets that offer lower rates of return in exchange for more security. A reduction in expected investment returns will require greater contributions to be made to the plan in order to achieve the same target benefit.

Researchers find a large and persistent gap when comparing investment returns in DB and DC plans, although the gap has narrowed somewhat over time. A 2013 report from CEM Benchmarking finds that DB pensions outperformed DC plans in average by 99 basis points, net of fees, over the 17 years ending in 2013—largely due to differences in asset mix.²⁷ Watson Wyatt found that DB plans outperformed DC plans by an annual average of 76 basis points, net of investment expenses, from 1995 to 2011.²⁸

These studies aggregate asset allocation and investment returns. This does not present much of a problem for DB plans, because asset allocation is relatively consistent across large funds that tend to be mature and have roughly similar demographic profiles. However, aggregated DC plan data tells us less about the “typical” investor because there is a large dispersion of asset allocations and returns among individual investors. In addition, aggregated data is of limited usefulness in determining long-term returns over a typical individuals’ career and retirement years as their asset allocation shifts from equities to fixed income securities, as prescribed by the TDF or lifecycle investment strategy.

In order to estimate gross investment returns for the DB and DC plans over our teachers’ working and retirement years, we start with asset allocation for each plan and then apply a uniform set of assumptions about the long-term returns for each asset class. The DB plan is assumed to have an asset allocation typical of a large public sector DB plan. In the ideal and individually directed DC plans, participants are expected to gradually shift out of higher risk/higher return assets in favor of lower risk/lower return assets.

Figure 6 shows the expected net annual investment return by age for the DB plan and both DC plans. In our model, the well-diversified DB plan is expected to achieve investment returns of 7.36 percent per year, net of fees. The net returns for the ideal DC plan (modeled with the same expenses and investment skill assumptions as the DB plan, as we will later explain) show that while the typical TDF asset allocation glide path used for the DC plans in this study earns higher returns than the DB plan during the first half of a teacher’s career, those returns drop below the DB plan when she is in her late 40s. To preserve her retirement wealth after she stops working, the teacher needs to reduce her exposure to equities even more. This results in a sacrifice of expected annual return of 2.8 percent by age 97. For detailed DB and DC asset allocation and projected gross investment returns, see Table A1 in the Technical Appendix.

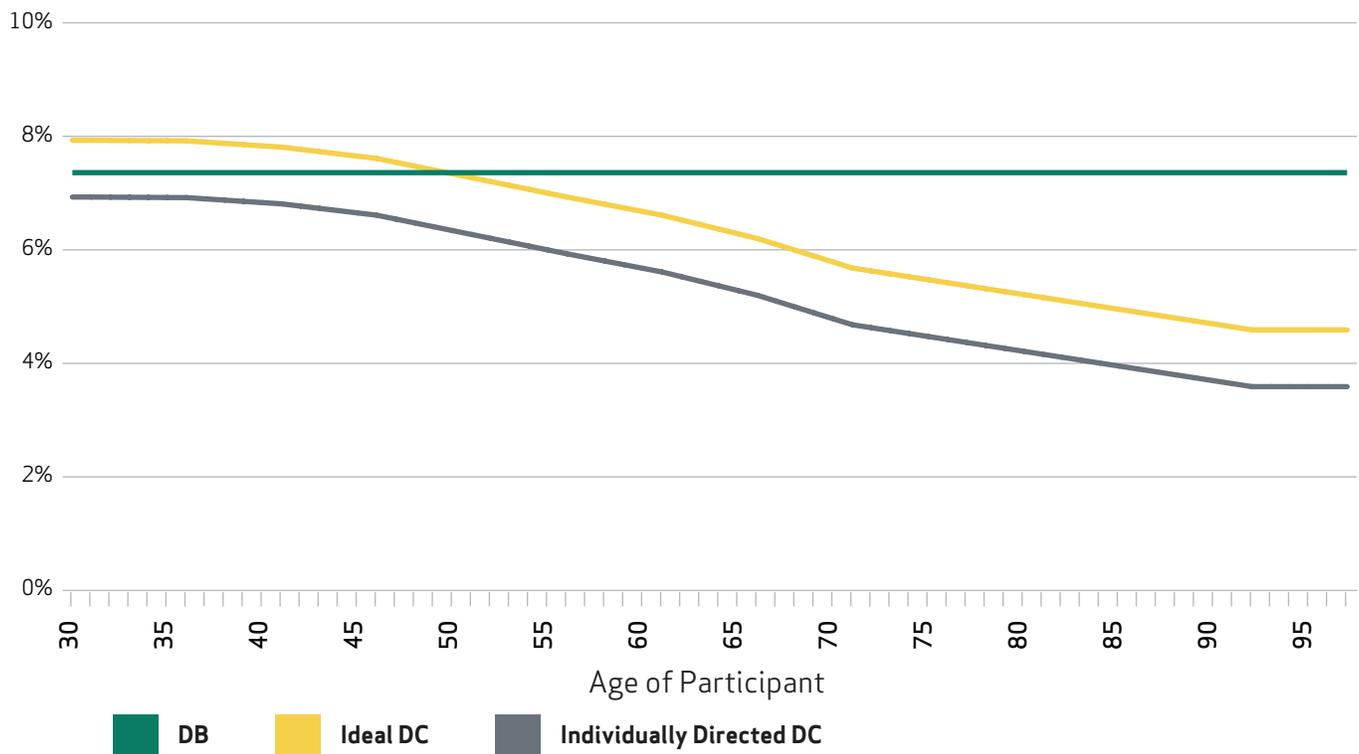
We find that the shift in portfolio allocation has a modest, but nonetheless significant, effect on cost. Specifically, we find that the per-retiree amount that must be accumulated in the

DC plan by retirement age now climbs to nearly \$700,000. By comparison, the DB plan requires about \$500,000. **After accounting for asset allocation in addition to longevity risk, contributions required to fund the target benefit now climb to 23.0 percent of payroll in the DC plans compared to 16.3 percent of payroll under the DB plan** (an increase of 41 percent). This summarizes the cost difference between the ideal DC plan and the DB plan. To arrive at the full cost difference for the individually directed DC plan, differences in investment expertise and expenses must also be taken into account.

Superior Net Returns Compared to Individually Directed DC Plan

In addition to asset allocation, another important reason why DB plans achieve higher investment returns than DC plans is that DB pension assets are pooled and professionally managed. Our model attributes a one percentage point “drag” on the investment returns in individually directed DC plans, based on fees and well-documented individual investor behavior.

Figure 6: Expected Annual Investment Return (Net of Fees)



Expenses paid out of plan assets to cover the costs of administration and asset management reduce the amount of money available to provide benefits. As a result, a plan that can keep these costs down will require lower contributions. By pooling assets, large DB plans are able to drive down asset management and other fees. For example, researchers at Boston College find that asset management fees average just 25 basis points (e.g., 0.25 percent) for public sector DB plans. By comparison, asset management fees for private sector 401(k) plans range from 60 to 170 basis points.²⁹ Thus, private DC plans suffer from a 35 to 145 basis point cost disadvantage, as compared with public DB plans. On their face, these differentials may appear small, but over a long period of time, they compound to have a significant impact. To illustrate, over 40 years, a 100 basis point difference in fees compounds to a 24 percent reduction in the value of assets available to pay for retirement benefits.³⁰

TDF expenses vary depending on whether the underlying funds are actively managed or passively managed (e.g., index funds). A Morningstar survey found that new contributions to TDFs have been shifting towards the latter, and that asset-weighted expense ratio for TDFs in 2012 was 91 basis points, down from 1.04 percent in 2008.³¹

Administrative costs are largely driven by scale. Thus, a large DB plan or DC plan can have opportunities to negotiate minimized administrative expenses. A DC plan involves costs that do not exist in a DB plan, such as the costs of individual recordkeeping, individual transactions, and investment education to help employees make good decisions. However, DB plans, unlike DC plans, bear the administrative costs of making regular monthly payments after retirement.

But fees are only part of the story; differences in the way retirement assets are managed in DB and DC plans play a substantial role. As previously discussed, investment decisions in DB plans are made by professional investment managers, whose activities are overseen by trustees and other fiduciaries.

Research has found that DB plans have broadly diversified portfolios and managers who follow a long-term investment strategy.³² We also know that the average individual in DC plans, despite their best efforts, often falls short when it comes to making sound investment decisions.

Furthermore, studies show that over the long term, individual investor level returns significantly lag behind the returns of any individual asset class or benchmark—largely due to inappropriate investment decisions.³³ For example, during the 2008 financial crisis, individual participants generally failed to re-balance their asset allocation, and those who did shift assets incurred significant losses by fleeing from equities near the bottom of the market.³⁴ In 2012 and 2013, investors pulled funds out of asset classes before they experienced price increases and into asset classes that were about to experience price drops.³⁵

We assume no net disadvantage on the basis of fees or investor skill for the ideal DC plan compared to the DB plan. This is a generous assumption given real life experience with TDF use and with DC investor behavior in general.

We do, however, isolate the impact of expenses and fees from the impact of investment skill for the individually directed DC plan. We assume that a 40 basis point disadvantage in fees and an estimated 60 basis point disadvantage from individual investor “behavioral drag” total to a net 100 basis point (1.00 percent per year) disadvantage in individually directed DC plan investment returns. Although the data clearly support using a 125 basis point or more combined effect, we continue to use only a 100 basis point disparity, as was used in the 2008 study. The Technical Appendix explores the impact of other levels of disparity.

The 1.00 percent drag on individually directed DC plan returns compounds over time to create a significant cost disadvantage relative to the DB plan. In particular, we find that the amount which must be set aside for each individual at retirement age now climbs to about \$800,000 (compared to the roughly \$500,000 required in the DB plan). **Thus after accounting for differences in net returns due to investment expertise and fees—in addition to the longevity risk and asset allocation factors described above—the level of required contributions climbs again for the individually directed DC plan, this time to 31.3 percent of payroll, compared to 16.3 percent under the DB plan** (an increase of 91 percent).

Taken together, the economies that stem from investment pooling and longevity risk pooling can result in significant cost savings to employees and employers/taxpayers. **In our model, required contributions to fund a given level of retirement benefit are 48 percent lower in the DB plan compared with the individually directed DC plan, and 29 percent lower compared to the ideal DC plan.**

V. SUMMARY OF RESULTS: DB PLANS REDUCE COSTS BY NEARLY HALF

Our analysis clearly demonstrates that DB plans are far more cost-effective than DC plans. We find that to achieve roughly the same target retirement benefit that will replace 53 percent of final salary, the DB plan will require contributions equal to 16.3 percent of payroll, whereas the individually directed DC plan will require contributions to be almost twice as high as the DB plan—31.3 percent of payroll. Even the “ideal” DC plan, generously modeled with the same fees and investor skill as the DB plan—provides benefits at a substantially higher cost of 23.0 percent of payroll.

We find that due to the effects of longevity risk pooling, maintenance of portfolio diversification, and greater investment returns over the lifecycle, a DB plan can provide the same level of retirement benefits at about 29 percent lower cost than an ideal DC plan and about 48 percent lower cost than an individually directed DC plan.

Table 1 breaks down the cost savings realized by the DB plan relative to the individually directed DC plan. First, the longevity risk pooling that occurs in the DB plan accounts for 10 percent cost savings. Second, DB plans' ability to maintain a more diversified portfolio drives another 11 percent cost savings. Third, superior net investments returns across the lifecycle generate an additional 27 percent reduction in cost compared to an individually directed DC plan—bringing the total cost savings to 48 percent.

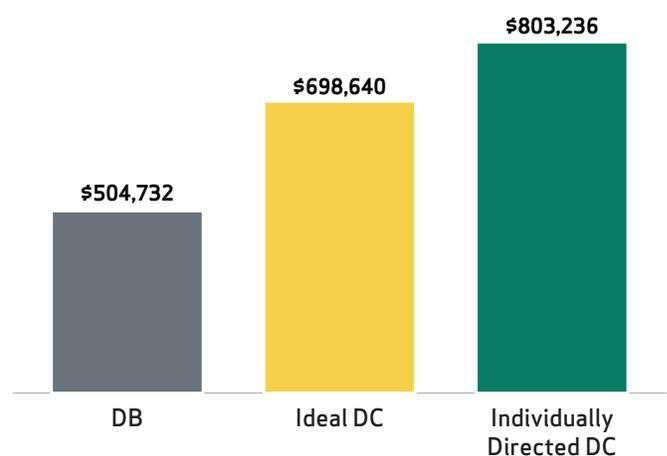
Our results also indicate that DB plans can do more with less. That is, they can ensure that all individuals in the plan (even those with very long lives) are able to enjoy an adequate retirement benefit that lasts a lifetime, at the same time that they require less money to be contributed to a retirement plan and fewer assets to accumulate in the plan. We calculated the amount of money that would be required to be set aside for each retiree in each type of plan, to provide a modest retirement benefit of about \$2,700 per month. As shown in **Figure 7**, at retirement age, the DB plan requires only about \$500,000 to be set aside for each individual, whereas the ideal DC plan requires about \$700,000 and individually directed DC plan requires about \$800,000. The difference—about

\$200,000 and \$300,000 for each and every employee under ideal DC plan and individually directed DC plan, respectively—illustrates that the efficiencies embedded in DB plans can yield large dollar savings for employers, employees and taxpayers.

Table 1: Tallying DB Plan Cost Savings Compared to Individually Directed DC Plan

Source	Savings
1. Longevity risk pooling	10%
2. Maintenance of portfolio diversification (staying invested in equities)	11%
3. Lower fees and professional management	27%
All-in cost savings in DB plan	48%

**Figure 7:
Per Employee Amount Required at Age 62
DB Plan vs. DC Plan**



Our findings indicate that DB plans provide a better bang for the buck when it comes to providing retirement income. We find that a DB plan can provide the same level of retirement income at almost half the cost of an individually directed DC plan. Even compared to an ideal DC plan with generous assumptions about fees and investor skill, a DB plan delivers

the same benefit for 29 percent less cost. An analysis of the costs of providing benefits for a different population—male public safety workers—is provided in the Technical Appendix, and finds similar results. Hence, DB plans should remain a centerpiece of retirement income policy and practice, especially in light of current fiscal and economic constraints.

Impact of Annuitizing DC Account Balances

Although this is not common, some DC plans offer individuals the ability to purchase annuities at retirement. This has sometimes been cited as a solution to the longevity risk obstacle discussed previously, and would eliminate the risk of running out of money no matter how long an individual lives.

However, our analysis indicates that the purchase of annuities does not overcome the inherent shortfall of DC plans *vis-à-vis* DB plans. This occurs for three reasons. First, insurance companies have inherent costs that employer sponsored DB plans do not. These include profit margins, risk charges, marketing costs, administration costs, and other costs. Second, insurers have capital requirements which essentially mean that they typically invest in safer fixed-income securities, while ongoing DB plans can invest more heavily in equities and earn greater investment returns. And third, current interest rates are extraordinarily low, making annuity costs more expensive than during most historical periods. Fluctuating financial market conditions can result in wide disparities in annuity income among individuals retiring with similar accumulated account balances at different points in time.

Many experts believe that the current low interest rate environment will revert to normal, so we have modeled annuitization both at 2014 rates as well as at rates based on investment return 1.0 percent per year higher than currently available. **Table 2** compares the various alternatives.

Table 2. Impact of Annuitization on DC Plan Funding Requirements

Plan	Target Balance at Retirement	Required Contribution (Percentage of Payroll)
DB	\$504,732	16.3%
Ideal DC (without annuities)	698,640	23.0%
Individually Directed DC (without annuities)	803,236	31.3%
Ideal DC with annuities – 2014 rates*	771,752	25.4%
Ideal DC with annuities – significantly improved rates	631,118	20.9%

*Average rates as of April 2014 from AnnuityShopper.Com, adjusted for projected mortality tables to age 62 female.

As can be seen from the table above, while annuities can completely resolve an individual's mortality risk, this insurance today comes at a significant cost. Many experts believe that the current low interest rate environment will not last forever. If this happens, annuities may become a more cost-efficient option, but the nature of third party private annuities will prevent them from becoming as efficient as well-managed DB plans.

VI. CONCLUSION

Despite notable changes in the retirement benefit landscape since 2008, including some improvement in DC performance and fees, DB pensions retain their cost advantage as a means of providing retirement benefits to workers. In this study, we compared the cost of providing equivalent benefits through a typical large public sector DB plan, an ideal DC plan, and an individually directed DC plan. Even compared to the ideal DC plan with no disadvantage in terms of fees and investor skill, the DB plan reduces costs based on longevity risk pooling and the maintenance of portfolio diversification. And when we examine the individually directed DC plan with more realistic assumptions regarding fees and investor skill, the DB plan realizes a hefty additional cost advantage due to its low expenses and professional management of assets.

The sources of cost savings in DB plans reflect, at a very basic level, the differences in how DB and DC plans operate. Group-based DB plans provide lifetime benefits and feature pooled, cost-efficient, professionally managed assets. These features drive significant cost savings that benefit employers, employees, and taxpayers. While well-designed DC plans can theoretically mimic some of these advantages—for instance, employers may select low-fee TDFs as a default investment option for their workers—DB plans would still retain their advantages of longevity risk pooling and long-term portfolio diversification. Using private annuities to convert DC account balances at retirement into a lifetime income stream does not close this gap because such annuities are expensive, especially when they include the kind of inflation protection offered by public DB plans.

When considering our results, it is important to keep in mind that in our effort to construct an “apples to apples” comparison, we made a number of simplifying assumptions that actually reflected more favorably on DC plans. For instance, we did not model any asset leakage from either the ideal or individually directed DC plan before retirement through loans or early

withdrawals. We also assumed that individuals followed a sensible “Goldilocks-like” withdrawal pattern in retirement—not too fast, not too slow, but just right. We used conservative estimates of the difference in actual investment returns between DB and DC plans. And, we used 80th percentile life expectancy to project required accumulations in the DC plans, rather than “full” life expectancies.

Thus, if anything, our analysis underestimates the cost of providing benefits in a DC plan and thereby understates the cost advantages of DB plans.

Due to the built-in economic efficiencies of DB plans, employers and policymakers should continue to carefully evaluate claims that “DC plans will save money.” As discussed, benefit generosity is a separate question from the economic efficiency of a retirement plan. While either type of plan can offer more or less generous benefits, DB plans have a clear cost advantage for any given level of retirement benefit. Consequently, shifting from a DB plan to a DC plan and maintaining the same contribution rate will generate significant cuts in retirement income. Considering the magnitude of the DB cost advantage, the consequences of a decision to switch to a DC plan could be dramatic for employees, employers, and taxpayers.

Finally, policymakers should consider proposals that can strengthen existing DB plans and promote the adoption of new ones. When viewed against the backdrop of workers’ increasing insecurities about their retirement prospects and the economic and fiscal challenges facing employers and taxpayers, now more than ever, policymakers ought to focus their attention and energy on this important goal. The very features that make DB plans attractive to employees drive cost savings for employers and taxpayers. In this way, DB plans represent a rare “win-win” approach to achieving economic security in retirement that should be recognized and replicated.

TECHNICAL APPENDIX: CALCULATING THE COST SAVINGS EMBEDDED IN DB PLANS

Methodology

We calculate the cost, expressed as a level percent of payroll over a career, of achieving a target benefit in a typical DB plan and compare that with the cost of providing the same target benefit in a typical DC plan.

We begin by constructing a cohort of 1,000 newly-hired employees. For the purposes of simplicity, we give this cohort a common set of features. All newly-hired employees are age 30 on the starting date of their employment, and they are all female teachers. They work for three years and then take a two-year break from their careers to have and raise children. They return to work at age 35 and continue working until age 62. Thus, the length of the career is 30 years. By their final year of work, their salary has reached \$60,000, having grown by 4 percent each year.

Modeling DB Plan Benefits and Costs

The DB plan provides a benefit in retirement equal to 1.85 percent of final average salary for each year worked. This represents the median benefit among DB plans covering public employees who are also covered by Social Security.³⁶ Final average salary is calculated on the basis of the final three years of one's career, which in this case is \$57,722. Thus, the initial benefit in the DB plan is \$32,036 per year or \$2,670 per month.

The DB plan provides a cost of living adjustment that ensures the benefit maintains its purchasing power during retirement. Inflation is projected at 3.0 percent per year. Thus, each individual in our cohort will receive a benefit equal to 53 percent of her final year's salary that adjusts with inflation. This DB plan (in combination with Social Security) would allow an employee to meet generally accepted standards of retirement income adequacy, or roughly 83 percent of pre-retirement income.³⁷

DB plans typically offer married participants the ability to receive joint-and-survivor annuity benefits, whereby when

the retiree dies, her spouse can continue to receive a monthly benefit that will last the spouse's lifetime. But the retiree pays the cost of this survivor's benefit. That is, the monthly benefit that would be payable on a single-life basis will be reduced by an actuarially determined factor to account for the fact that payments may continue if the retiree dies before her spouse. Therefore, for simplicity, we model all benefit payouts on a single-life basis (and do the same for the DC plan), using the Generational RP-2014 Healthy Female Annuitants mortality table with projection under scale MP 2014 (hired in 2014 at age 30).³⁸

In order to model the contributions that are required to fund these benefits, we start by establishing expected investment returns based on asset allocation. In order to construct the asset allocation for the DB pension, we drew on the latest available average public pension asset allocation data from surveys from a number of sources: Wilshire, Cliffwater, CEM Benchmarking, and NASRA/NCTR Public Fund Survey. In particular, these sources were used to set allocations to broad asset categories, such as domestic stocks, domestic bonds, global stocks, global bonds, private equity, real estate, other alternatives, and cash. For more detailed categories, we drew on proprietary data provided by CEM Benchmarking and discussions with Callan. The resulting asset allocations are listed in **Table A1**.

Our expected investment returns for each asset class are based on a weighted average of the rate of return projections in the 2014 Survey of Capital Market Assumptions conducted by Horizon Actuarial Services (**Table A1**).³⁹

We estimate DB plan expenses of 45 basis points. A study from the Center for Retirement Research at Boston College found average expenses to be 43 basis points for public DB plans and 97 basis points for DC plans.⁴⁰ Census data from 2012 indicates 45 basis points for state-administered DB plans, inclusive of both investment and administrative expenses.⁴¹

Based on this methodology, the DB plan is expected to achieve nominal investment returns of 7.36 percent per year, net of

fees. Readers should exercise caution in comparing this rate of return to expected returns reported by individual public pension funds, because funds tend to use higher inflation assumptions in their forecasting. We used an inflation assumption of 3.0 percent in this study for benefit increases as well as for capital market expectations.

On the basis of these inputs, we calculate the contribution that will be required to fund this benefit through the DB plan over the course of a career, and express this as a level percent of payroll. We find that the cost to fund the target retirement benefit, smoothed over a career, comes to 16.3 percent of payroll. Contributions could be made entirely by the employer or, given public sector regulations, may be split between the employer and employee.

Modeling DC Plan Benefits and Costs

Modeling the cost of the target retirement benefit in the DC plan requires some adjustments based on what we know about how DC plans differ from DB plans. First, because employees are not provided with an annuity benefit at retirement under the DC plan, we determine the size of the lump sum amount that an individual would need to accumulate by their retirement date in order to fund a retirement benefit equivalent to that provided by the DB plan (including inflation adjustments) for a period of 35 years, or to age 97. This represents the 80th percentile life expectancy of female teachers who are now 30 years old when they retire at age 62. It corresponds to the age beyond which 20 percent of individuals survive, and therefore still poses a significant risk to DC participants of outliving their savings. In fact, our mortality table indicates that one individual out of 1,000 will survive to 110.

Thus our model underestimates the cost of funding retirement benefits through a DC plan: one out of five individuals will experience a reduced standard of living, compared to what they would experience under a DB plan. These individuals would be likely to respond to a long life by gradually reducing their withdrawals from the plan to avoid the possibility of having their retirement income reduced to zero.

We assumed that the DC plan would be invested in a TDF, which automatically adjusts asset allocation from stocks to bonds as a worker approaches retirement. We estimated

the asset allocation glide path of TDFs from Vanguard and Fidelity, from age 30 to age 71, based on data for multiple target date funds ranging from 2010 to 2045. These TDFs are set for target retirement dates spaced 5 years apart. Then we averaged the asset allocations from the two providers, which together represent the majority of assets in the TDF market.⁴² See **Table A1** for the asset allocation trajectory.⁴³

To model the impact of the shift to a more conservative portfolio allocation beyond age 71, we have individuals begin to shift their portfolio allocation to gradually reduce the share held in equities to zero and increase the holdings of cash and liquid investments, treasuries and agency debt, and corporate bonds to 100 percent by age 97. The investment/withdrawal strategy we model is not the result of an optimization rule; rather, it follows ad hoc rules.

Finally, in order to arrive at gross returns for each plan, we applied estimates of long-term returns for each asset class from a capital market assumptions survey.⁴⁴

Withdrawals are designed to mimic DB plan payouts, at least in the early years of retirement, declining in later years. Work by William Sharpe and colleagues suggests that an optimal approach would integrate investment and withdrawal strategies. Specifically, they find that a constant withdrawal rate must be paired with a riskless investment strategy in order to be optimal for an individual.⁴⁵ However, a post-retirement asset allocation entirely concentrated in risk-free assets would dramatically drive up the cost of the DC plan. Thus our model's ad hoc investment and withdrawal strategies would tend to understate the cost advantage of DB plans.

We developed estimates of DC plan costs and expected returns based on a review of existing research. Again, the Center for Retirement Research study cited above found average expenses to be 95 basis points for DC plans.⁴⁶ Callan researchers recently found asset-weighted expenses for large institutional mutual funds in DC plans to be 85 basis points; this estimate does not include employer expenses, particularly administrative expenses.⁴⁷ The Teachers Retirement System of Texas, which conducted an in-depth retirement benefit design study, estimated total expenses of 47 basis points for its DB plan and 93 basis points for an individually directed DC plan based on plan administrative data.⁴⁸

Although not inclusive of all expenses or exclusive to DC plans, it is worth noting that a Morningstar study reported an average of 91 basis points for TDFs in 2012.⁴⁹ Fees range widely for TDFs, and DC funds in general, depending on whether they are actively managed or rely on low-cost index funds. The fund expense ratio for a typical Vanguard TDF is about 16 basis points (not including any load or employer expenses). The typical Fidelity TDF is invested in over two dozen mutual funds, most of them actively managed, and has an expense ratio of about 77 basis points—again, not including employer expenses.⁵⁰ A Morningstar survey found that asset-weighted expense ratio for TDFs in 2012 was 91 basis points, down from 1.04 percent in 2008.⁵¹

We assumed that in an ideal DC plan, the plan sponsor would drive down expenses and that investments would effectively be limited to low-cost TDFs. Thus we assumed only 45 basis points, the same total costs as a DB plan. However, for the individually directed DC plan, we chose an optimistic estimate of 85 basis points for investment and administrative expenses, given that this is the asset-weighted fee average exclusive of employer expenses from the above-cited studies.

We also assumed that participants in an individually directed DC plan would earn lower returns than the DB or ideal DC plan, due to well-documented mistakes related to asset allocation and market timing decisions—for example, investing too much or too little in stocks, and reacting emotionally to market fluctuations by selling assets as prices fall and buying back into the market as prices rise.⁵² In addition to behavioral finance studies, key studies indicate that individual investor returns lag behind market returns. This is not a significant problem for pension funds because they are managed by professionals who exercise discipline in the face of market fluctuations. However, investor-level data shows that individuals earn returns significantly below the returns posted by the funds in which they invest.⁵³

Estimates of this gap vary depending on the market cycles captured in the time frame, but most studies that cover a long time frame show significant under-performance by individual investors. For instance, a Morningstar study found that investors lagged mutual fund returns by .95 percentage points in the 10 years ended 2012, and 2.49 percentage points in the 10 years ended 2013. The study also examined net flows in and

out of each asset class, and found that funds tended to flow out before prices rose, and to flow in before prices fell.⁵⁴

We optimistically assume a modest behavioral drag effect of 60 basis points for the individually directed DC plan, although a significantly larger effect is justified by the data cited above. Combined with higher fees, this means a lag of 100 basis points, or 1.00 percentage point, for net investment returns for the individually DC plan compared to the DB plan and ideal DC plan. This differential is assumed to persist from working years through retirement, so the return disadvantage compounds on top of the gradual shift in portfolio allocation. (We calculate the impact of each effect separately to avoid double counting.)

Our model does not include important additional differences between DB and DC plans, such as the “leakage” of assets from DC plans through loans or early withdrawals, two features which are rare in DB plans. Nor does it analyze the effects of ups and downs in financial markets and the impact that these have on investment returns and costs in both DB and DC plans over a career. Also, the fact that in DC plans some individuals will have “better luck” with investing than others means that individuals’ retirement prospects will exhibit a wider dispersion than what is predicted by our model. The 2012 Texas TRS plan design study, for instance, estimated that participants in an individually directed DC plan would have a 66 percent chance of having less than 62 percent of the benefit offered by the DB plan with the same contributions.⁵⁵

Sensitivity Analyses

Impact of Expense and Fee Differential

The analysis above assumed that due to the combined effect of higher expenses and drag on investment returns resulting from typical investor behavior, an individually directed DC plan would have a 100 basis point (1.00 percent) disadvantage compared to both the ideal DC plan and the DB plan. As discussed above, studies of individual investor level returns seem to indicate a higher differential, while some sources may assert a differential in overall net returns of less than 1.00 percent. Consequently, we have expanded our analysis to consider the impact of higher and lower disparities of 0.50, 1.25, and 1.50 percent. The findings are summarized in **Table A2**.

Table A2. Impact of Different Expense and Behavioral Drag on Plan Funding Requirements

Combined Excess Fees and Behavioral Drag	Plan	Target Balance at Retirement	Required Contribution (Percent of Payroll)
None	DB	\$504,732	16.3%
None	Ideal DC	698,640	23.0%
1.00%	Individually Directed DC	803,236	31.3%
Alternate Scenarios			
0.50%	Individually Directed DC	748,137	26.8%
1.25%	Individually Directed DC	833,121	33.8%
1.50%	Individually Directed DC	864,702	36.6%

Impact of Lower- or Higher-than-Expected Returns

The analysis has assumed that each year’s annual investment return is exactly that which is expected. In practice, returns will not be that stable, particularly in the years when significant assets are invested in equities. While the long-run returns are expected to average out to those assumed, there is a possibility that they would fall short. For a typical DB plan with a typical asset allocation, which is expected to return approximately 7.5 percent over thirty years, there is about a 25 percent probability that returns will fall below 6.0 percent and about a 25 percent probability that returns will exceed 9.0 percent. DC plans would have a similar deviation when invested significantly in equities. Once the individual retires and trims equity exposure, volatility declines.

The ramifications of higher or lower returns are complex. Let us analyze the event where returns from age 30 to 45 are as expected, but returns from 45 to 75 are either 1.5 percent higher or 1.5 percent lower than expected.

Under a DB plan, if returns average 6 percent for this period of thirty years, there would be a shortfall of \$120,000 per retiree at age 75. This would create an unfunded liability which would require additional contributions. In practice, the DB

plan would begin to fund for this unfunded liability shortly after it began at age 45. Using traditional actuarial funding methods, contributions would grow from 16.3 percent of pay from ages 30 to 45 up to 29 percent at age 62 and continue at this level beyond age 62.

On the other hand, if returns average 9 percent for this period of thirty years under a DB plan, there would be a surplus at age 75. This would result in reduced contributions. In practice, the DB plan would begin to reduce contributions shortly after the surplus begins at age 45. Using traditional actuarial funding methods, contributions would drop from 16.3 percent of pay from ages 30 to 45 to zero at age 62 and actually generate an offset to future contributions beyond age 62.

If returns are 1.5 percentage point lower than expected under a DC program, then four possible outcomes can occur. First, the individual could work longer to try to accommodate the target retirement benefit levels. Second, the individual can taper back their withdrawals during retirement, resulting in reduced income. Third, the individual can run out of money and hope for another source of income. Fourth, the individual can also change their asset allocation in hope of high returns which would help catch up for the shortfall, but we do not model this option because it is essentially a gamble with very different possible outcomes.

Table A3. **Comparison of Retirement Income Generated by a Fixed Contribution Rate**

Plan	Balance at Retirement	Monthly Benefit as Percentage of Final Pay
DB	\$504,732	53%
Ideal DC	\$496,902	38%
Individually Directed DC	\$419,579	28%

In the individually directed DC case, an individual who had 1.5 percentage point inferior return beginning at age 45 would find at age 62 that they are short of their \$800,000 needs by approximately \$140,000. In order to meet their retirement needs, they would need to continue working to age 66. But unbeknownst to them, they still have nine years ahead of them of inferior returns. They could also merely reduce their annual withdrawals by 17 percent. The other extreme is that they simply keep their fingers crossed, but if returns continue as outlined above, they would run out of retirement funds at age 86 rather than age 97 as targeted. This means that instead of only a 20 percent likelihood of outliving their savings, there is a 63 percent likelihood.

If returns are superior by 1.5 percent under the individually directed DC plan, then the alternatives are much more palatable. The individuals can begin to reduce savings amounts, can retire earlier, can pay themselves a higher monthly retirement benefit, or can leave more to their heirs. This analysis will not address these fortunate alternatives.

Benefit Comparison with Constant Contributions

Our analysis has assumed that employers are targeting an acceptable level of retirement income, then solving to determine the contributions necessary to produce such an income level. This illustrated that a DB plan can produce a given level of benefits at a 48 percent cost reduction from individually directed DC plans. (This is an important consideration, given that discussions of retirement benefit targets are often absent

from discussions of DB and DC plan costs.) But in the real world, employers rarely implement a DC plan and increase contributions. A more germane analysis would look at the reduced level of benefits that would result from switching from a DB pension to a DC plan while maintaining the same contribution rate. As **Table A3** shows, a fixed contribution rate of 16.3 percent of pay generates substantially lower retirement benefits in the ideal DC plan and the individually directed DC plan, compared to the DB plan.

Benefit Cost Comparison for Male Public Safety Workers

One workforce segment which very often is covered by DB plans is public safety. Police officers and firefighters throughout the US tend to have DB coverage, either through a statewide pension plan or a local plan. These workers generally retire from service at younger ages than other workers and are usually not covered by Social Security, and thus have higher benefit multipliers. As another test of the DB plan efficiency, we modelled a male firefighter retiring at age 55 after 25 years of service. This firefighter was assumed to have final earnings of \$80,000 and a benefit of 2.5 percent of pay per year of service.

Our findings for male public safety workers, shown in **Table A4**, are very similar to those for female schoolteachers discussed above. The DB plan is 27 percent less expensive than the ideal DC plan and 46 percent less expensive than the individually directed DC plan.

Table A4. Comparison of DB vs. DC Plan Costs for Teachers and Firefighters

Model Parameters and Results	Teacher	Firefighter
Gender	Female	Male
Hire Age	30	30
Retirement Age	62	55
Service at Retirement	30 (excl. two year break)	25
Salary at Retirement	\$60,000	\$80,000
Benefit Multiplier	1.85% per year	2.50% per year
Covered by Social Security	Yes	No
Initial Monthly Benefit at Retirement	\$2,670	\$4,008
Median Life Expectancy at Retirement	90	87
80th Percentile Life Expectancy at Retirement	97	94
Balance Required at Retirement – DB Plan	\$504,732	\$810,930
Annual Contribution Required (as a Percentage of Payroll) – DB Plan	16.3%	26.1%
Balance Required at Retirement – Ideal DC Plan	\$698,640	\$1,132,456
Annual Contribution Required (as a Percentage of Payroll) – Ideal DC Plan	23.0%	35.9%
Balance Required at Retirement – Individually Directed DC Plan	\$803,236	\$1,326,386
Annual Contribution Required (as a Percentage of Payroll) – Individually Directed DC Account	31.3%	48.1%
DB Cost Savings as a Percentage of Ideal DC cost	29%	27%
DB Cost Savings as a Percentage of Individually Directed DC cost	48%	46%

ENDNOTES

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- 26 This analysis does not address the issue of underfunded DB plans, nor does it address another factor which is particularly important in the discussion of DC investments—the degree to which adequate contributions are made by employees and contributions and investment earnings remain in the plan until retirement. This is a concern in most DC plans, where employees can borrow from their retirement account or take money out before retirement age (with the attendant tax penalties). This problem of “leakage” from DC plans has been well-documented and is receiving more attention by researchers and policymakers. See C. Weller, and J. Wenger, 2008, “Robbing Tomorrow to Pay for Today: Economically Squeezed Families are Turning to their 401(k)s to Make Ends Meet,” CAP Economic Policy Report, Center for American Progress, Washington, DC; and M. Fellowes and K. Willemijn, 2013, “The Retirement Breach in Defined Contribution Plans: Size, Causes, and Solutions,” HelloWallet.com.
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DOES THE SOCIAL SECURITY “STATEMENT” ADD VALUE?

BY STEVEN A. SASS*

Introduction

Social Security is the nation’s most important source of retirement income, providing half or more of the monthly income of well over half of all retired households. Workers planning their retirement thus need to know how much they and their spouse will get and how much more they could get if they work longer and claim later. Benefits, however, are set by a complicated formula based on a worker’s lifetime earnings record at retirement, the age he claims, the earnings record of a current or former spouse, whether that spouse is alive, and when that spouse claimed. So workers, on their own, cannot be expected to know how much they could get.

The Social Security Administration (SSA) started an ambitious initiative in 1995 to address this issue. It began mailing out personalized annual *Statements* that provided estimates of an individual’s monthly benefit at various claiming ages. This *brief* reports the findings of studies produced by the Social Security Administration’s Retirement and Financial Literacy Research Consortiums that assessed the effectiveness of the initiative – whether the *Statement* made workers better informed about their benefits and whether it changed their behavior.

The Social Security *Statement*

The Social Security *Statement* is designed to give recipients a better understanding of the program as well as the benefits they might get.¹ It thus provides an overview of Social Security retirement, survivor, and disability benefits and how these benefits are funded. More important for retirement planning, it gives each recipient a personalized estimate of the monthly benefit he might get, in current dollars, if claimed at three different ages: 1) at the worker’s full retirement age (FRA); 2) at 70, the age for claiming the highest monthly benefit; and 3) at 62, the earliest a worker can claim retirement benefits (see Figure 1 on the next page).² The *Statement* also provides personalized estimates of the recipient’s monthly disability benefit and benefits provided to a surviving spouse and children should the recipient become disabled “right now” or die “this year.” The *Statement* also informs recipients that if they get retirement or disability benefits, their spouse and children might also qualify for benefits, though it does not provide dollar estimates for these specific benefits.

The *Statement* does not estimate the “spousal” benefits the recipient might get based on the earnings of a spouse or ex-spouse.³ Nor does it show how

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FIGURE 1. EXAMPLE OF “YOUR ESTIMATED BENEFITS” IN THE SOCIAL SECURITY STATEMENT

Your Estimated Benefits	
*Retirement	You have earned enough credits to qualify for benefits. At your current earnings rate, if you continue working until... your full retirement age (67 years), your payment would be about.....\$ 1,680 a month age 70, your payment would be about\$ 2,094 a month age 62, your payment would be about\$ 1,159 a month
*Disability	You have earned enough credits to qualify for benefits. If you became disabled right now, your payment would be about.....\$ 1,527 a month
*Family	If you get retirement or disability benefits, your spouse and children also may qualify for benefits.
*Survivors	You have earned enough credits for your family to receive survivors benefits. If you die this year, certain members of your family may qualify for the following benefits: Your child.....\$ 1,176 a month Your spouse who is caring for your child.....\$ 1,176 a month Your spouse, if benefits start at full retirement age.....\$ 1,569 a month Total family benefits cannot be more than\$ 2,908 a month Your spouse or minor child may be eligible for a special one-time death benefit of \$255.

Source: U.S. Social Security Administration (2015).

the age the worker claims retirement benefits could affect the survivor benefits of a spouse or ex-spouse.⁴ The *Statement* nevertheless provides valuable information for retirement planning that workers would not be able to get without the assistance of SSA.

The initial 1995 mailing went to workers age 60 and over who were not receiving benefits. SSA then expanded the program and within five years was sending annual *Statements* to 125 million workers ages 25 and over. The mailings cost about \$50 million a year, and budgetary constraints led SSA to suspend the program in 2011. But Congressional interest and an “improved budgetary situation” resulted in the resumption of a modified program in 2014. SSA now mails *Statements* to workers not receiving benefits at ages 25, 30, 35, 40, 45, 50, 55, and 60 or older.⁵

The question is whether the *Statement* adds value – whether it improves workers’ knowledge about their benefits and helps them make better decisions.

Does the *Statement* Improve Knowledge?

SSA funded a series of surveys, conducted by the Gallup Organization between 1998 and 2004, that supported the notion that the *Statement* increased knowledge and improved retirement planning. Two-thirds of respondents in the final 2004 survey recalled

receiving the *Statement*; those who did thought that it provided valuable information; and these respondents were more knowledgeable about their benefits than those who did not recall receiving a *Statement*. A later survey found that, of those age 55 and over who recalled receiving the *Statement*, over 40 percent also said that they used the information in planning their retirement.⁶

These surveys, however, did not address whether the *Statement* was responsible for making respondents better informed – or whether better-informed respondents were better able to recall receiving the *Statement*. Nor did they address whether the *Statement* mailings actually affected the recipients’ retirement plans.

Studies by Giovanni Mastrobuoni and Andrew Biggs, which did address these concerns, identified a far more nuanced relationship between the *Statement* and what workers know.⁷ These studies assessed the effect of the mailings on workers approaching retirement using the *Health and Retirement Study* (HRS), a nationally representative biennial survey of older Americans. Each biennial survey asks respondents to identify their expected retirement age and the monthly Social Security benefit they expect to get at that age. If the *Statement* improved benefit knowledge, a greater share of the respondents who received the mailings should be able to estimate that benefit, and their estimates should be more accurate.

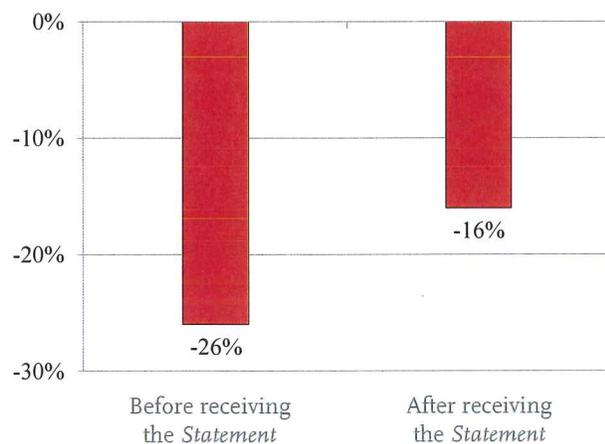
Mastrobuoni’s study used the gradual introduction of the *Statement* to identify workers who had and had not received a mailing at a given age. No one in the 1992 or 1994 HRS surveys had received a *Statement*; in the 1996 survey, only those ages 58 and over had received a *Statement*; and essentially all HRS respondents had received a *Statement* by the 1998 survey.⁸

Mastrobuoni’s analysis found that the mailings had little effect on the benefit knowledge of workers who contact SSA directly. About 30 percent of workers ages 55-57, rising to 55 percent at age 61, contact SSA, presumably to learn about their benefits. But the *Statement* dramatically improved the knowledge of those who did not contact SSA. Before receiving the mailings, not contacting SSA reduced the likelihood that a worker could estimate his Social Security benefit at his expected retirement age, controlling for other factors that affect this result, by an astonishing 26 percentage points. After mailings, the effect of not contacting SSA was cut by more than one third, from 26 to 16 percentage points (see Figure 2).⁹ Mastrobuoni also found that the *Statement* increased the accuracy of benefit estimates – primarily but not exclusively among workers who did not contact SSA.¹⁰

The Biggs study examined the ability of workers to estimate their benefit in the HRS survey conducted immediately prior to claiming. The study reports

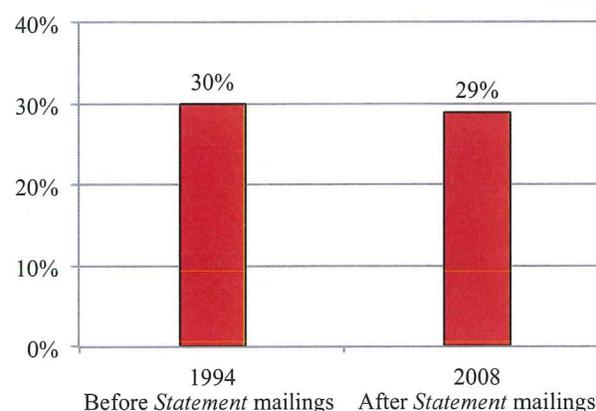
a slight reduction in the share unable to estimate their benefit in 2008 as compared to 1994, before the mailings went out. More strikingly, though, nearly 30 percent of workers in 2008, who had received annual *Statements* for a decade, were unable to estimate the benefit they would claim in two years or less (see Figure 3).¹¹ Among those who did provide an estimate, one third were off by more than 25 percent.

FIGURE 2. EFFECT OF NOT CONTACTING SSA ON PERCENTAGE OF WORKERS ABLE TO ESTIMATE MONTHLY BENEFIT, PRE- AND POST-STATEMENT



Source: Mastrobuoni (2011).

FIGURE 3. PERCENTAGE OF WORKERS UNABLE TO ESTIMATE MONTHLY BENEFIT WITHIN 2 YEARS OF CLAIMING, PRE- AND POST-STATEMENT



Note: Responses are as of the year of the biennial HRS survey conducted immediately prior to benefit claiming. Source: Biggs (2010).

Taken together, these studies: 1) confirm that the mailings improve benefit knowledge – primarily of workers who read the *Statement*, do not contact SSA, and are not at the cusp of retirement; but 2) a large share of workers at the cusp of retirement, despite receiving the *Statement*, cannot provide an estimate of the benefit they will get in two years or less.

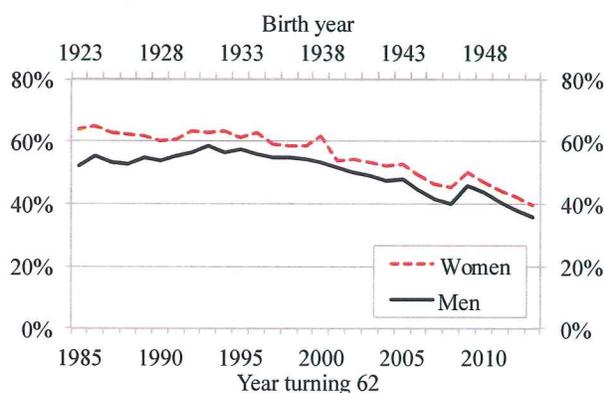
Does the *Statement* Change Behavior?

If the *Statement* improves knowledge, does it help workers make better retirement decisions? For example, if workers learn that the benefit at their expected retirement age is “too low” to meet their anticipated

needs, the *Statement* clearly shows that they could increase their monthly benefit by working longer and claiming later. The question is whether they act on such information.

After 1995, when workers began receiving annual *Statements*, the share of 62-year-old workers claiming benefits at 62 declined sharply (see Figure 4). The 2004 Gallup survey funded by SSA reported that a third of the respondents who recalled receiving a *Statement* said that it led them to “reconsider” their retirement date. This finding suggests that the *Statement* and the information it contained about the effect of claiming later on monthly benefits could have contributed to the striking change in early claiming behavior.

FIGURE 4. PERCENTAGE OF INSURED INDIVIDUALS TURNING 62 WHO CLAIMED AT 62, BY BIRTH YEAR



Source: Munnell and Chen (2015).

Mastrobuoni’s study, however, found no change in behavior associated with receipt of the *Statement*. It found no uptick in workers changing their expected claiming age. Nor did it find that the *Statements* affected the age at which workers actually claimed. The literature has identified many factors associated with the decline in early claiming, such as rising educational attainment, the shift in employer plans from defined benefit pensions to 401(k)s, the increase in Social Security’s FRA, rising longevity and medical costs, and the increased employment of married women (which tends to keep their husbands in the

work force longer). Controlling for several such factors, Mastrobuoni’s study found that the *Statement* had no effect on the age workers claimed.¹²

Neither the Biggs nor Mastrobuoni studies assessed whether the *Statement* improved worker knowledge about the increase in monthly benefits should they delay claiming. But a survey conducted by Jeffrey Liebman and Erzo Luttmer in 2008 found that the respondents, who had been receiving annual *Statements* for nearly a decade, were reasonably well-informed about the incentive. Eighty-five percent of the respondents knew that claiming later increases monthly benefits, and they provided reasonably accurate estimates about how much monthly benefits would rise.¹³

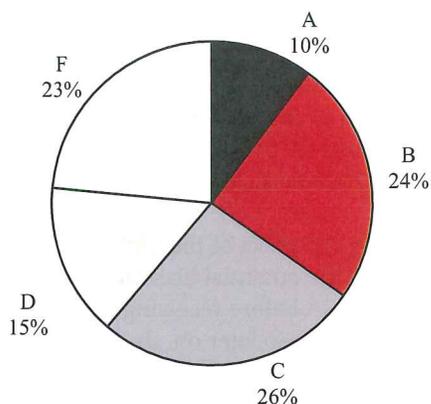
The key takeaway from these studies is that workers receiving the *Statement* generally know that claiming later would increase their monthly benefit; but no evidence exists that the *Statement* changes when they claim. As Mastrobuoni concludes, either workers were “already behaving optimally [prior to receiving the *Statement*], or the information contained in the *Statement* is not sufficient to improve their retirement behavior.”

Is the Information in the *Statement* Sufficient?

It could be the case that workers are “behaving optimally,” with or without the *Statement*. If so, a 2010 survey by Matthew Greenwald, Arie Kapteyn, Olivia S. Mitchell, and Lisa Schneider found that most workers are unaware that they are. When asked “How well prepared financially are you for retirement?” about two-thirds of the respondents gave themselves a grade of “C” or less (see Figure 5 on the next page).¹⁴

The survey confirmed that most workers know information contained in the *Statement* – what their monthly retirement benefit will be and that they could increase their monthly benefit by working longer and claiming later. The survey also found that the great majority of workers do not expect their benefit to be “adequate to maintain a good standard of living.” But when asked “What steps, if any, have you taken in response?” 28 percent said they had done nothing;

FIGURE 5. SELF-ASSESSED FINANCIAL PREPARATION FOR RETIREMENT ON A SCALE FROM "A" TO "F"



Source: Greenwald et al. (2010).

4 percent said they intend to work in retirement; and all other responses involved saving or paying down debt. Essentially none of the respondents said they had pushed back their retirement age.¹⁵ Even though workers “know” they could increase their monthly benefit by working longer, they seemed to consider retirement planning solely in terms of saving and investment.

The major impediment to the *Statement's* ability to help workers prepare for retirement could be what Greenwald et al. call “a lack of knowledge about the key factors necessary for comprehensive retirement planning.” These factors include knowing: 1) how much income they need to “maintain a good standard of living;” 2) how much they will get from Social Security; 3) how much they need from savings and other sources to complement what they get from Social Security; and 4) what they could do to get what they need, such as working longer.

A comprehensive retirement planning framework would show workers that pushing back their retirement age does more than raise their monthly Social Security benefit. It also reduces the savings they need at retirement, as the higher monthly benefit reduces the income they need from savings; and it shortens the length of time their savings need to provide that income. Retiring later also increases the savings that workers will have at retirement, as it gives them more time to save and gives their savings more time to accumulate investment income.

The lack of such a larger retirement planning framework could be why the *Statement* mailings seem not to have prompted changes in behavior.

Conclusion

The Social Security *Statement* aims to improve benefit knowledge and help workers make better retirement decisions. Surveys funded by SSA indicated that the *Statement* delivered significant value – that most workers recall receiving the *Statement* and that most who do find it valuable, with over 40 percent of those approaching retirement saying they use the information in retirement planning.

The studies reviewed in this *brief* generally confirm that the *Statement* adds value by improving benefit knowledge. In part because of the *Statement*, most workers approaching retirement can now provide an estimate of the monthly benefit they will get when they retire and how they could increase that benefit by working longer and claiming later.

The studies nevertheless have not found that the *Statement* affects claiming behavior. To help workers make better retirement decisions, the information the *Statement* provides might need to be presented in a “comprehensive” framework that allows workers to develop a plan.

Endnotes

- 1 SSA also intended the *Statement* to improve public understanding of the Social Security program (Smith and Couch 2014a).
- 2 The estimates assume the worker's real earnings remain the same to retirement and the worker retires and claims at the same age. The *Statement* also informs workers that the estimates are based on current law; that Congress could change the law and amounts Social Security pays out; that the Social Security trust fund will likely be exhausted at a specified date; and that ongoing tax revenues will then be sufficient to cover just 75-80 percent of currently scheduled benefits.
- 3 Spousal benefits are "top-ups" that assure workers a benefit equal to half their spouse's full retirement age benefit, with the amount assured reduced for early retirement. Such top-ups cannot be estimated with any degree of accuracy many years prior to retirement. Providing such estimates also raises privacy concerns. And due to the increased employment of married women, few workers are expected to be eligible for significant spousal top-ups.
- 4 The "Thinking About Retirement?" insert, included with *Statements* sent to workers age 55 and over beginning in 2000, includes "Rules that may affect your survivor: If you are married and die before your spouse, he or she may be eligible for a benefit based on your work record. If you start benefits before your full retirement age, we cannot pay your surviving spouse a full benefit from your record. Also, if you wait until after your full retirement age to begin benefits, the surviving spouse benefits based on your record will be higher." As many wives, in particular, see a sharp drop in income upon becoming a widow, the effect of working longer on a spouse's survivor benefits can be an important consideration.
- 5 SSA also does not mail *Statements* to workers receiving benefits or who have a "my Social Security" account that provides access to the *Statement* online. For those workers who have a "my Social Security" account, SSA notifies them by e-mail each year when a new statement is available online. See U.S. Social Security Advisory Board (2009); and Smith and Couch (2014a).
- 6 U.S. Social Security Advisory Board (2009); Smith and Couch (2014b).
- 7 Mastrobuoni (2011); Biggs (2010).
- 8 Mailings went to all workers age 53 and over in 1997, age 47 and over in 1998, age 44 and over in 1999, and age 25 over in 2000.
- 9 In estimating the effect of the *Statement*, Mastrobuoni adjusted for the potential bias due to workers who did not contact SSA before receiving the *Statement* but might have done so later on. In addition to the effect of the *Statement*, other factors the study identified as reducing workers' ability to estimate their benefit were gender, education, and ethnicity.
- 10 Results reported in Smith and Couch (2014) are consistent with Mastrobuoni's finding that the *Statement* improves benefit knowledge among workers who do not contact SSA. Smith and Couch assessed the effect of the *Statement* on workers age 46 and younger using data from Gallup surveys conducted before and after this age group received the *Statement*. Very few workers in this age group are likely to contact SSA, and the study found a significant increase in benefit knowledge in the group that received the *Statement*.
- 11 Using a larger sample, we found that workers unable to estimate their benefit within two years of claiming dropped from 30 percent in 1994 to 26 percent in 2008. This 4-percentage-point improvement is consistent with Mastrobuoni's estimate of the effect of the *Statement* on benefit knowledge and also shows a large share of workers at the cusp of retirement unable to estimate their benefit.
- 12 If the *Statement* made workers more aware of the increase in monthly benefits if they delay claiming, and this awareness led them to change when they claim, the increase in monthly benefits should have a greater effect on the claiming behavior of workers who receive the mailings. Mastrobuoni's analysis, however, found that the increase in monthly benefits had much the same effect on the claiming behavior of workers who had and had not received a *Statement*, controlling for age, age squared, year, gender, education, marital status, race, and labor market experience (number of years with positive earnings).

13 Liebman and Luttmer (2012). The median estimates of how much benefits would rise each year if a worker delayed claiming, by those who knew that benefits would rise, was 5.0 percent of the worker's FRA benefit both before and after the FRA. The actual increments were 6.25 percent before the FRA and 8 percent after the FRA. The Liebman and Luttmer survey also found workers reasonably well-informed about the effect of claiming later on a spouse's survivor benefit. The respondents also cited the *Statement* as their most commonly used source of information, with 92 percent citing it as a source of information, and the most "useful" source of information, tied with a visit to SSA with an average score of 4.2 on a 5-point "usefulness" scale.

14 While the results presented in Figure 5 are from a telephone survey of workers of all ages, the authors indicate that "there are virtually no differences by age." Respondents in an online survey that the study conducted were even less confident about their financial preparation than the telephone survey respondents.

15 The question was asked of the 83 percent of respondents who expect Social Security benefits would not be adequate to maintain a good standard of living. The question was open-ended, with respondents indicating their responses. The study organized the responses into groups and listed the eight "top mentions," the lowest of which was mentioned by 3 percent of the sample. Working longer was not one of the top eight responses mentioned.

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Trust Fund Reserve Gains One Year for Projected Depletion Date

Posted on [July 23, 2015](#) by [Stephen C. Goss, Chief Actuary](#)



By now, you've probably heard that this year marks the 80th anniversary of the signing of the Social Security Act. In case you didn't know, this year is also the 75th anniversary of the payment of the first monthly benefits.

And, today, the Social Security Board of Trustees released the [75th annual report](#) to Congress on the financial status of the Social Security trust funds.

As a quick refresher: The Social Security trust funds include the Old Age and Survivors Insurance (OASI) fund and the Disability Insurance (DI) fund. Benefits to retired workers and their families, and to families of deceased workers, are paid from the OASI trust fund. Benefits to disabled workers and their families are paid from the DI trust fund.

The report shows that, combined, the funds now have an additional year – from 2033 to 2034 – before their reserves are depleted. The Old Age and Survivors fund alone also gets an extra year from 2034 to 2035.

Some factors that led to this improvement include (1) faster growth in average wages in the future, because of slower growth in employees' private health insurance cost – due at least in part to provisions of the Affordable Care Act, and (2) improvements in how we project the earnings of American workers by age.

The DI fund is still projected to deplete its reserves late in 2016. After that, the income collected through taxes will be enough to pay only 81 percent of the scheduled benefits. So, an adjustment to maintain full disability benefits is needed soon.

The president has proposed temporarily reallocating more of the total Social Security payroll tax rate to the disability fund to give Congress more time to consider comprehensive changes to the Social Security program as a whole.

The Social Security program is sustainable, but needs some adjustments. To keep the program solvent after 2034, Congress could choose to increase payroll taxes by about one-third, reduce benefits by about one-fourth, or make some combination of these or other adjustments.

Because of the importance of Social Security to all Americans, we can be confident that Congress will make timely and well-considered adjustments, just as they have whenever needed since 1935.

(Visited 1,786 times, 1,780 visits today)

This entry was posted in [Disability](#), [General Questions](#), [Retirement](#), [Survivors](#) and tagged [ACA](#), [Affordable Care Act](#), [Congress](#), [DI](#), [OASI](#), [Old Age](#), [social security](#), [SSA](#), [Survivors Insurance](#), [Trust fund](#) by [Stephen C. Goss, Chief Actuary](#). Bookmark the [permalink](#).

Transition Management

Beyond the Basics

- Fund sponsors employ transition management for portfolio liquidation, benchmark or manager changes, asset allocation shifts, portfolio rebalancing, and other restructuring. The objective is to preserve the value of the legacy portfolio and give the target portfolio the best possible start.
- Callan believes the transition manager must accept the role of a fiduciary because the manager is entrusted with executing an effective liquidation and asset reallocation, while managing cost and risk throughout the entire process.
- In this paper, Callan reviews the various explicit and implicit costs of a transition, discusses multiple available sources of liquidity, and offers discussion points for plan sponsors vetting a potential manager's transition management capabilities.

Introduction

Transition management is the cost-effective and efficient restructuring of institutional portfolios from single or multiple investment managers/asset classes to a new allocation over a short-term horizon. The concept behind transition management is relatively simple and straightforward; however, passing the baton from legacy portfolio to target portfolio is a complex transaction that can be fraught with uncertainty. Transition management goes beyond the basics—it is not just another trade—and every activity in the transition process has cost and risk ramifications. Explicit commission costs or trading basis point charges are but a small percentage of the actual transition costs.

A fund sponsor seeks out a transition manager to assist with portfolio liquidation, benchmark or manager changes, asset allocation shifts, portfolio rebalancing, and/or other restructuring of designated investment portfolios or company stock (single stock portfolios). Transition management is not merely a trading activity; rather, it should be treated as short-term asset management that requires prudence and

Transition management centralizes the coordination of activities and parties involved in order to eliminate unnecessary transactions, reduce costs, and maintain the maximum amount of market exposure (asset class or manager style) during the transition period.

investment discretion. It requires the skill and judgment of an investment fiduciary. The distinguishing factor of a transition manager is that it “terminates” itself naturally after the completion of a transition; so, the transition manager is actually an asset “reallocation” manager.

The transition manager is responsible for managing risks, implementation shortfall (explicit and implicit costs), information leakage, trading (in-kind transfer, crossing, agency and/or principal basis), and liquidity considerations. Identifying “Point A” [legacy portfolio(s)]—and especially “Point B” [target portfolio(s)]—is critical. You cannot establish a coherent portfolio transition strategy without knowing Point B.¹

Transition management centralizes the coordination of activities and parties involved in order to eliminate unnecessary transactions, reduce costs, and maintain the maximum amount of market exposure (asset class or manager style) during the transition period. While this is no small task, the transition manager is entrusted to prudently manage the process. The objective is to preserve the value of the legacy portfolio while giving the target portfolio (whether an asset class and/or manager) an optimal beginning.

Understanding Transition Costs

In an ideal world, the legacy portfolio would instantly map to the target portfolio at zero cost. But the reality is that transitions are one of the most complex transactions with which a fund sponsor must contend, and every single activity in the process has cost (risk) ramifications. While the final costs are not known until the actual liquidation of the legacy portfolio(s) and funding of the target portfolio(s), ensuring that all parties understand the costs inherent in the transition process will help to avoid unpleasant surprises.

Implementation shortfall—which compares the value of the assets at the end of the transition to the value of the portfolio assuming an immediate shift to the destination portfolio—is the accepted measurement of transition cost.² The difference in value is the total cost to implement change.

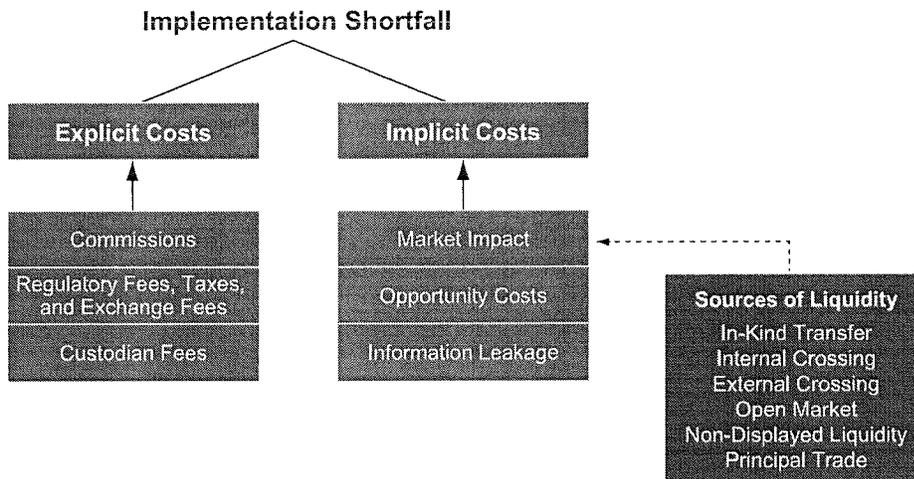
The measure is the total performance of the transition assets compared to the performance of the target portfolio; thus, it is crucial that the target portfolio is defined. Although there are different variations to the calculation of implementation shortfall, the basic premise is the same. **Exhibit 1** illustrates the explicit and implicit costs that make up the implementation shortfall.

¹ Firing a manager without a replacement manager can be problematic because the assets to be liquidated would be subjected to a myriad of uncertainties and costs. The liquidation is a one-way trade given that the target manager is unknown. The exit and temporary parking costs can be expensive. The exit costs are commissions, regulatory fees, taxes, custodian fees, foreign currency execution, exchange fees, etc. The temporary parking costs are investment management fees (short-term investment fund management fees for all cash liquidation and investment management index/passive fees) and/or optimized solution costs (such as synthetic overlay using futures, ETFs, swaps, etc.) that may apply while waiting for the target manager.

² Implementation shortfall was introduced by Andre Perold, who defined it as the difference between the actual portfolio return and the paper return benchmark. (“The implementation shortfall: Paper vs. reality.” *The Journal of Portfolio Management*, Spring 1988: 4 – 9.)

Exhibit 1

The Components of Implementation Shortfall: Explicit and Implicit Costs



Source: Callan

Explicit costs are the most visible during the transition period. These include commissions (compensation for the transition manager),³ regulatory fees, taxes, exchange fees, and custody fees. Explicit costs are the most discernible, yet they are also the smallest component of the total transition cost. The largest explicit cost is commissions. The cost is normally expressed in cents per share or basis points of the notional traded value. The explicit fees depend on the trading strategy that is selected prior to execution. **Implicit costs** constitute the largest portion of the entire transition cost. They include market impact, opportunity costs, and information leakage.

Market Impact and Sources of Liquidity

A transition planning phase is essential to mitigate market impact, which is the price movement of the securities in the portfolio when the trade order is sent. It is influenced by numerous factors, including the volume of the security being traded, liquidity (average daily trading volume), bid/ask spread, price volatility of the security, and the particular country/exchange where the security is traded. The trade needs to be executed with stealth, speed, and strength.

Because of the significant cost attached to market impact, it is where the transition manager earns its keep, and the manager's ability to optimize multiple sources of liquidity is of utmost importance. These sources include in-kind transfer, internal crossing, external crossing, open market, non-displayed liquidity, and principal trade.

³ Sources of compensation can include foreign currency (FX) fees or spread earned, click fees, finder's fees, revenue sharing arrangements with broker dealers, etc.

In-kind transfer matches the legacy portfolio(s) against the target portfolio(s) to determine which securities are common to both the sell side and the buy side of the transition. This type is always optimal because there is no liquidity impact and it is instantaneous. There is no change in ownership and no bid/ask spread.

Internal and external crossing use electronic venues to anonymously match orders between buyer and seller at a specified price. Internal crossing is the ability to cross the transition flow against the manager's other trading flows, which result from other transitions or securities/funds moving in and out of their portfolios or books. Depending on the transition manager's depth of internal liquidity, internal crossing is ideal because it reveals little; if natural internal crosses are present, there is virtually no market impact. However, waiting for a cross can introduce timing risk. External crossing provides the same benefits as internal crossing. The main difference is that the transition manager is now seeking external liquidity, typically through electronic networks that cater to institutional order flow. (Examples of external crossing networks include ITG's POSIT®, Liquidnet, and BIDS.) The drawbacks are the size and liquidity of the cross, and information leakage. Dark pools of liquidity, which are technically considered external crossing, are categorized as non-displayed liquidity for the purposes of this paper.

Open market uses the primary exchange where a stock is listed; essentially, the transition manager has to execute the order out in the marketplace. Market impact is high because the transition manager has to pay the bid/ask spread. Although the speed of going to the market reduces timing risk, the liquidity impact could be substantial. Ultimately, the primary exchange is the single largest source of liquidity for any given security.

Given that market trading is slowly going away from central exchanges where pricing transparency exists, dark pools are becoming part of the toolkit available to transition managers

Non-displayed liquidity is actually the floor brokers (not specialists) who are willing to buy or sell individual stocks if there is a need for liquidity. Floor brokers will not display or advertise the bid/ask price and size on any trading screen. Access to non-displayed liquidity, via internal or external brokers, can be very important for an optimal transition. Another component of non-displayed liquidity is the proliferation of so-called "dark pools" of liquidity. Given that market trading is slowly going away from central exchanges where pricing transparency exists, dark pools are becoming part of the toolkit available to transition managers. Depending on how open and transparent—or how murky, dark, or toxic—it is, investors should be mindful that such non-displayed liquidity access is not a free lunch. Transition managers have to understand the liquidity characteristics of dark pools and be astute in going in and out; in short, "swim at your own risk."

Principal trade is the ability of a broker/dealer to utilize capital to implement transactions by acting as the buyer or seller and counterparty to the transaction. The broker/dealer is not acting as an agent (where the agent is seeking to achieve the best execution in the markets for the client). When liquidity and timing are issues, principal trades may be the right option. The speed is immediate; however, the commissions and spreads of such arrangements can be very high.

Opportunity Costs and Information Leakage

Opportunity costs occur when the value of the target portfolio rises and/or the value of the legacy portfolio falls before the full completion of the transition. This is the tracking error between the legacy and the

target portfolio (or the cost of not being invested in the target portfolio). This is the single largest cost in any transition. The magnitude of the opportunity cost is exacerbated when a transition involves multiple asset classes because the legacy and target portfolios cut across the asset allocation target of a fund sponsor. The transition manager is responsible for the timing of implementation of the asset allocation shift. Thus, the expert use of synthetic overlay and trading strategies is paramount. A good transition manager knows how to manage the tracking error and asset allocation exposure gaps, especially if they are acting as a discretionary fiduciary. The management of opportunity cost is no longer a trading issue, but an investment management exercise.

Information leakage costs occur even before the actual liquidation begins and can persist during the transition period. One common practice by fund sponsors is to bid out the details of a transition every time there is portfolio restructuring. Such a practice often compromises the value of the assets being transitioned even before the actual start date of the liquidation. Another approach is to hire a bench or pool of transition managers under an optional use contract, perhaps over a three-to-five-year period. Limiting the disclosure to a few helps to preserve confidentiality. The process is further solidified if the transition managers are contracted as fiduciaries. Another aspect of information leakage is when a transition manager is trying to get to an indication of interest for a specific security at a certain price point or testing the liquidity of the market. This is also known as “pinging” the market and it could lead to information leakage. The impact of information leakage can be felt primarily in three ways:⁴

During the transition process, the transition manager is looked upon as a discretionary caretaker of the portfolio(s) to be liquidated and as the conduit for the funding of the target portfolio(s).

1. Price impact occurs when the stock price moves in opposition to the transition manager’s trade order (e.g., the price increases for a buy order) because of information leakage.
2. Gaming takes place when traders use information about the transition manager’s trade order to affect execution and thereby manipulate prices.
3. Adverse selection is when the transition manager’s execution is conditioned on whether the stock price moves in the transition manager’s favor (e.g., the buy order gets executed if the stock moves downward later, but not if it moves up).

Just like opportunity costs, information leakage cannot be completely quantified. The only way to try to control this cost is to manage information from all parties involved—fund sponsor, consultants, investment managers (terminated, current, and newly hired), custodian, and the transition manager.

Setting Policies and Guidelines

During the transition process, the transition manager is looked upon as a discretionary caretaker of the portfolio(s) to be liquidated and as the conduit for the funding of the target portfolio(s). A fund sponsor has to establish certain guidelines with a transition manager and at minimum should include the following responsibilities:

- ♦ **Strategy development:** Before the transition, the transition manager should provide the fund sponsor with a written portfolio transition (liquidation) strategy, including the time frame required, to achieve the desired objective of liquidating the legacy portfolio(s) and building (and/or funding) the target portfolio(s).

⁴ “Are You Playing in a Toxic Dark Pool? A Guide to Preventing Information Leakage.” Hitesh Mittal, Head of Algorithmic Trading, Investment Technology Group, June 2008.

- **Fiduciary responsibility:** The transition manager will act as a fully discretionary fiduciary and will perform the portfolio transition—from legacy to target portfolio(s)—with utmost care and prudence. The fund sponsor realizes that markets fluctuate and risks are inherent during the transition period. However, market forces do not absolve the transition manager from negligence. The transition manager also must carry the appropriate coverage for errors and omissions and professional liability insurance.
- **Seamless execution:** The manager should minimize tracking error and maintain asset class (benchmark) exposure, and should coordinate trading activity with investment managers (both legacy and target portfolios) and the custodial bank. During the transition period, the preservation of capital must be taken into consideration through the expert use of all sources of liquidity, namely: in-kind transfers (“cherry picking” of the legacy portfolio for the target portfolio), internal and external crossing networks, primary exchanges, non-displayed liquidity, and principal trades. The strategic and tactical deployment of cash, futures, ETFs, and other hedging strategies are among the tools required to accomplish a smooth transition.
- **Daily reporting:** During the transition period, daily reporting of all trade activity—from commencement of the liquidation to the completion and full funding of the target portfolios—should be available to the fund sponsor.
- **Final analysis:** After the completion of the transition, the transition manager should provide the fund sponsor with a report on the outcome of the transition. The report should include relevant statistics (e.g., tracking error, costs, volume-weighted average price, T Standard, etc.) and full trading/transaction reports.

The Fiduciary Transition Manager

Since the concept of the “fiduciary” transition manager was introduced by Callan in 2004, there has been much debate on what that really entails. To help determine the extent of a transition manager’s fiduciary scope of responsibilities, a fund sponsor should use the following list as a starting point for deeper conversations. Confirm whether the manager will:

- Provide at a minimum three options to effectuate a transition (liquidation), detail the costs, pros, and cons for each, and include a recommendation.
- Vote proxies during the transition period.
- Be responsible for mandatory and voluntary corporate actions.
- Retain investment discretion and control of the transition/legacy portfolio(s) absent a target portfolio(s) and, if so, the maximum length of such investment discretion.
- Apply risk management tools to manage tracking error and mitigate risk.
- Ensure best execution in the selection and evaluation of broker outlets, whether on an agency or principal basis.
- Be able to contract in writing as a fiduciary.
- Disclose all sources of revenue, including the other side of the trade, foreign currency, click fees, dark pool utilization, etc.

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- Contain costs and fees detrimental to the value of assets.
 - Curtail information leakage, including pre-hedging and front running activities detrimental to the fund sponsor.
 - Disclose all aspects of foreign currency execution, including all sources of revenue.
 - Accept and report using the T Standard as the relevant measure for implementation shortfall.
 - Accept that what is in the best interest of the fund sponsor, the plan, and its beneficiaries is of paramount importance and may not necessarily be aligned with the transition manager's best interests.

Beyond the Basics

Transition management goes beyond the basics. During that period when the baton is being passed from legacy portfolio(s) to target portfolio(s), an extremely complex transaction occurs. In managing that process, the transition manager becomes the discretionary caretaker of the assets involved and must accept the role of a fiduciary—a role with many inherent responsibilities. The transition manager is entrusted with executing an effective liquidation and is also required to be a cost and risk manager, a project manager, and an asset reallocation manager. Ultimately, the objective is to preserve the value of the legacy portfolio and give the target portfolio the best possible start.



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