JCPER

JOINT COMMITTEE ON PUBLIC EMPLOYEE RETIREMENT
SECOND QUARTER MEETING
April 10, 2014

The Joint Committee on Public Employee Retirement held its 2nd Quarter Meeting on Thursday, April 10, 2014 at 8:00 am in House Hearing Room 1. With a quorum being established, Representative Leara called the meeting to order. Joint Committee members in attendance were Senators Chappelle-Nadal, Keaveny, Kehoe, Lamping and Walsh and Representatives Anders, Bernskoetter, Pierson, Runions and Wieland.

Representative Leara introduced to the committee Laura Smith. Laura is a session part-time employee who is helping with historic record preservation.

Representative Leara turned the meeting over to the Executive Director, Ronda Stegmann. The Director presented action items that require approval of the committee. The Director requested the authority from the committee to purchase a new computer and printer, which will be used to replace outdated equipment. Additionally, the Director discussed the annual request for salary increases equal to those passed by the appropriations process for all state employees. The committee also discussed the conference held by the Missouri Association of Public Employee Retirement Systems (MAPERS). The Director indicated the committee must approve conference expenses for staff and/or committee members to attend. Senator Kehoe made the motion, Senator Keaveny seconded the motion and by unanimous consent the Committee approved the budgetary items, which included purchase of equipment, proposed salary increases for JCPER staff levels included in the finalized FY 15 state budget and staff and committee reimbursement for attendance to the MAPERS conference in July.

The Director reviewed pension related legislation that appear to be moving through the legislative process. It is was noted 31 bills are being tracked. The modifications to Chapter 21 and 105 which were discussed and approved by the committee is in a stand alone bill, HB 1882 and has also been amended in an SCS and added onto HB 1044 for consideration. The committee will receive an abbreviated status report of the proposals moving on a more frequent basis over the last weeks of the legislative session.

The Director discussed retiree health care information. For fiscal years ending after December 15, 2008 the Governmental Accounting Standards Board (GASB) required the disclosure of annual Other Post Employment Benefits (OPEB) costs and any unfunded actuarial accrued liability. Research was done by JCPER staff relative to retiree health care for Missouri state government, the 10 largest municipalities and the 10 largest counties. OPEB results equaled a total unfunded actuarial accrued liability of $3,584,454,252. It was noted there are also OPEB liabilities that are held by political subdivisions, including school districts, fire protection district, and universities. Discussion was held regarding retiree health care and the resulting obligations. Senator Chappelle-Nadal asked for OPEB information relative to the schools in her Senatorial District.

Annual plan survey procedure was discussed. The Director indicated the surveys will be sent out to the pension plans within the next couple of weeks. Tutorial information has been added to the survey to provide clarity and to help direct retirement plan staff in providing the needed information.

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The retirement survey from the State Auditor's office is on going but is anticipated to be released prior to the end of the legislative session. A copy will be forwarded to committee members upon completion. Working with the auditor's office has proven to be beneficial to JCPER staff regarding our database information and procedures. The interim will provide time to review years of data for each plan in order to ensure consistency. A Citizen Summary from the recent audit of Reemployment of State Retirees was reviewed. This audit provided information relative to the number of state retirees working in state government positions. It was noted state statutes allows a state retiree to work up to 1,040 hours in a state government position and continue to receive a retirement benefit. A provision that exists which allows retired members of the closed retirement plan of MoDOT & Patrol Employees Retirement System (MPERS) to return to a MOSERS covered position full-time and continue to receive a retirement benefit was reviewed.

Quarterly plan reporting was reviewed from the fourth quarter of 2013. Sixty-five defined benefit plans participated in this reporting. Investment experience was positive with many reported returns being in the double digits. The quarterly reporting is used as a precursor for what to expect with the annual survey .

Under other business, the Director called the committee's attention to information provided by Mr. Michael Rathbone with the Show-Me Institute. It was indicated Mr. Rathbone requested his testimony and supplemental information be provided to the committee for the record. In addition, Representative Leara recognized that the committee has a vacancy due to the appointment of Senator Rupp to the Public Service Commission.

No further business being presented, the committee adjourned.

Ronda Stegmann
Executive Director

JCPER

JOINT COMMITTEE ON PUBLIC EMPLOYEE RETIREMENT

2nd QUARTER MEETING
April 10, 2014
8:00a.m.— House Hearing Room 1

AGENDA

Roll Call

Budgetary Items*
Equipment Approval
Salary Approval
MAPERS Approval

Legislation

Retiree Health Care Information

Annual Plan Surveys

State Auditor's Office

Quarterly Reporting

Other Business

**Action Items*

PROPOSED EQUIPMENT REPLACEMENT COSTS

Replacement Computer with MS Office Pro 2013

PC and Monitor	$850.10
Microsoft Office Pro 2013 License	$336.45

Replacement Printer

HP 3015 LaserJet Printer	$759.83
Total	$1,946.38

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PROPOSED SALARY INCREASES

	Current Annual Pay Rates	Proposed State Employee increase of 1% beginning January 1, 2015*
Director	$70,500	$71,205
Analyst	$40,500	$40,905

**Any committee approval would be contingent upon pay provisions passed in the FY15 appropriations process.*

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ESTIMATED MAPERS CONFERENCE EXPENSES

Staff	
Registration	$150.00
Lodging	$330.00
Travel	$70.00
Total	**$550.00**

JCPER Members	
Registration	*
Lodging	$220.00
Travel	$35.00
Total	**$255.00**

** MAPERS waiving Registration for JCPER members*

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JCPER FY 14 Appropriation	$164,439
Total Approximate Expenditures (as of 03/31/14)	$82,202
Balance available as of 03/31/14	**$82,237**

Conference

Registration
Sponsorship
Current Agenda
Lodging
Conference Dates

Conference Agenda

MAPERS 2014 Conference

"Bridging the Gap"

July 9 - 11, 2014 Tan-Tar-A Resort

Wednesday, July 9, 2014

Trustees Training Workshop Sessions
Open to Plan Sponsor & Associate Members

10:00 am - 5:00 pm *Registration/Courtesy Desk Open*

Tract 1 - Beginner

12:30 - 1:00 pm **Decoding Pension-ology (Understanding "Pension Speak")**, Rob Rust, PSRS (Retired)
1:00 - 1:30 pm **Sunshine Law Requirements**, Tom Durkin, Office of Attorney General
1:30 - 2:00 pm **Federal Legislation As it Affects MO Public Pension Plans**, Jim Moody, James R. Moody & Associates
2:00 - 2:15 pm *1st Afternoon Break*
2:15 - 2:45 pm **Beginning Investments**, Brian Collett, LAGERS
2:45 - 3:15 pm **Fiduciary Responsibility**, Bill Ackerman, Klausner, Kaufman, Jensen & Levinson
3:15 - 3:45 pm **Security IT**, Rick Deshler, Sagitec
3:45 - 4:00 pm *2nd Afternoon Break*
4:00 - 4:30 pm **Capitol Report**, Ronda Stegmann, Joint Committee on Public Employee Retirement (Combined Session - Salon A)

Tract 2 - Advanced

12:30 - 1:00 pm **Sunshine Law Requirements,** Tom Durkin, Office of Attorney General
1:00 - 1:30 pm **Federal Legislation As it Affects MO Public Pension Plans**, Jim Moody, James R. Moody & Associates
1:30 - 2:00 pm **Fiduciary Responsibility**, Bill Ackerman, Klausner, Kaufman, Jensen & Levinson
2:00 - 2:15 pm *1st Afternoon Break*
2:15 - 2:45 pm **Security IT**, Rick Deshler, Sagitec
2:45 - 3:15 pm **Advanced Investments**, Brian Collett, LAGERS
3:15 - 3:45 pm **Actuarial Funding,** Ken Alberts, Gabriel, Roeder, Smith & Company
3:45 - 4:00 pm *2nd Afternoon Break*
4:00 - 4:30 pm **Capitol Report**, Ronda Stegmann, Joint Committee on Public Employee Retirement (Combined Session - Salon A)

5:30 - 7:00 pm *Whole Hog Reception - Open to all Attendees/Guests/Family (Name Tags Required)*

Thursday, July 10, 2014

General Session, Salon A, 6th Floor - Open to All Registrants

7:00 - 8:15 am *Breakfast Buffet - Open to all Attendees/Guests/Family (Name Tags Required)*
7:30 am - 4:00 pm *Registation/Courtesy Desk Open*
8:15 - 8:30 am **Opening Remarks** - Bob Wilson, MAPERS Board President
8:30 - 9:00 am **Reframing the Debate - Bo**b Wilson, MAPERS Board President
9:00 - 10:00 am **National Public Pension Update** - Hank Kim, NCPERS
10:00 - 10:15 am *Morning Break*
10:15 - 11:00 am **Bridging MO Plans (Asset Allocation) Panel** - Brian Collett, LAGERS, Seth Kelly, MOSERS, Jim Pyle, KCPD
11:00 - 11:50 am **Risk Management** - Joe Scoby, PEAK6 Advisors, LLC
11:50 - 12:00 N *Awards & Sponsor Recognition*
12:00 - 1:15 pm *Lunch - Open to all Attendees/Guests/Family (Name Tags Required)*
1:15 - 2:15 pm **Finance** - Charles Payne, Wallstreet Strategies (Keynote Speaker)
2:15 - 2:45 pm **Economics** - Scott Crossley, Aksia, LLC
2:45 - 3:15 pm **Bridging the Alternatives - DB/DC - Cash Balance** - TBA
3:15 - 3:30 pm *Afternoon Break*
3:30 - 4:30 pm **Committee Decision Making** - TBA
3:30 - 4:30 pm **Benefit Specialists Break-out Session - What to do When . . .**
(Participant Communication, Retirement Counseling, etc.)
Guest Panel - Benefit Specialists from MPERS, MOSERS, CERF, PSRS
5:30 - 7:00 pm *Evening Reception - Open to all Attendees/Guests/Family (Name Tags Required)*

Friday, July 11, 2014

General Session, Salon A, 6th Floor - Open to All Registrants

7:00 - 8:15 am *Breakfast Buffet - Open to all Attendees/Guests/Family (Name Tags Required)*
8:15 - 9:15 am **Why Ideas Catch On** - TBA
9:15 - 9:45 a**m** **Is Facebook Right for your Retirement System?** - TBA
9:45 - 10:15 am TBA - TBA
10:15 - 10:30 am **General Business Meeting - Close of Conference**, Bob Wilson, MAPERS Board President
10:30 - 10:45 am *Morning Break - Refreshments Served*

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2014 RETIREMENT LEGISLATION

SENATE BILLS			SENATE ACTION						HOUSE ACTION				OTHER ACTION	
Bill Number	System Affected	Description	Sponsor	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Perfected	Passed 3rd Read	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Passed 3rd Read	Notes	Governor Action
SB 550	All Public Plans	Provides that public employees are ineligible for retirement benefits if found guilty of certain crimes << Fiscal Note	Sater	Governmental Accountability & Fiscal Oversight	Hearing Conducted 02/05/14	DP w/SCS 03/05/14	Formal Calendar Bills for Perfection							
SB 607	Springfield Police & Fire Retirement Plan	Modifies ballot language relative to public safety tax renewal << Fiscal Note	Dixon	Ways & Means	Hearing Conducted 01/23/14	DP 02/27/14	03/25/14	03/27/14	Ways & Means					
SB 672	PACARS	Allows counties to submit to the voters a proposition to change the full-time county prosecutor position back to a part-time position << Fiscal Note *Similar provisions in SCS SB 824*	Parson	Jobs, Economic Development and Local Government	Hearing Conducted 02/05/14	DP w/SCS 03/05/14	03/10/14	03/13/14	General Laws	Hearing Conducted 04/01/14				
SB 675 (HB 1044)	LAGERS	Allows a covered employer to elect LAGERS administration of prior closed pension plan << Fiscal Note	Kehoe	Seniors, Families & Pensions	Hearing Conducted 02/25/14	DP w/SCS 03/05/14	03/25/14	03/27/14	Retirement	04/10/14 9:00 AM HHR 1				
SB 823	All Public Plans	Provides that public employees are ineligible for retirement benefits if found guilty of certain crimes << Fiscal Note	Dixon	Seniors, Families & Pensions	Hearing Conducted 03/11/14	DP w/SCS 04/01/14								
SB 824	PACARS	Allows for the establishment of Prosecutorial Districts << Fiscal Note *Similar provisions in SCS SB 672*	Dixon	Judiciary & Civil & Criminal Jurisprudence	Hearing Conducted 03/10/14	DP w/SCS 03/26/14	Formal Calendar Bills for Perfection							
SB 835	SHERIFFS'	Provides pay increases for sheriffs < <Fiscal Note	Munzlinger	Jobs, Economic Development and Local Government	Hearing Conducted 03/05/14									
SB 925	MOSERS	Requires a General Assembly or Statewide Elected Official who first hold office on or after 1-1-15 to participate in a defined contribution retirement plan	Emery	Rules										

2014 RETIREMENT LEGISLATION

SENATE BILLS			SENATE ACTION						HOUSE ACTION				OTHER ACTION	
Bill Number	System Affected	Description	Sponsor	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Perfected	Passed 3rd Read	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Passed 3rd Read	Notes	Governor Action
SB 928	MOSERS	Relating to General Assembly employee benefits	Lamping	Rules										
SB 929	MOSERS	Requires Statewide Elected Officials who first hold office on or after 1-1-15 to participate in a defined contribution retirement plan	Lamping	Rules										
SB 980	MOSERS/ MPERS	Allows a retired member, who has returned to employment, to pay to the retirement system the total amount of benefit payments received since initial retirement date and be considered as having not been retired and considered an active member	Schaefer	Seniors, Families & Pensions										

2014 RETIREMENT LEGISLATION

HOUSE BILLS			HOUSE ACTION						SENATE ACTION				OTHER ACTION	
Bill Number	System Affected	Description	Sponsor	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Perfected	Passed 3rd Read	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Passed 3rd Read	Notes	Governor Action
HB 1044 (SB 675)	LAGERS	Allows a covered employer to elect LAGERS administration of prior closed pension plan **<< Fiscal Note**	Leara	Retirement	Hearing Conducted 01/16/14	DP w/HCS Consent 01/23/14 Rules DP Consent 02/11/14	02/20/14	02/26/14	Seniors, Families & Pensions	Hearing Conducted 04/08/14				
HB 1208	MOSERS	Establishes the MO Science & Innovation Reinvestment Act - allows associated employees to be considered state employees for the purposes of membership in MOSERS & MCHCP	Berry	Economic Development										
HB 1217	All Public Plans	Specifies certain unlawful transfers or assignments of pension benefits **<< Fiscal Note**	Dugger	Financial Institutions	Hearing Conducted 01/22/14	DP w/HCS Consent 01/22/14 Rules DP Consent 02/11/14	02/20/14	02/26/14	Seniors, Families & Pensions	Hearing Conducted 04/08/14				
HB 1231	PACARS	Changes law regarding judicial procedures; $4 surcharge to those who pled guilty & paid a fine through a fine collection center; Adjusts monthly county contributions depending on plan funded ratio; Modifies prior service credit provisions; Excludes system from 80% funded requirement for benefit enhancements **<< Fiscal Note** ***HCS includes PACARS provisions in HB 1821***	Cox	Judiciary	Hearing Conducted 02/05/14	DP w/HCS 04/02/14 Ref to Rules 04/07/14								
HB 1244	MOSERS	Modifies retirement benefit formula for General Assembly members & Statewide Elected Officials who first hold office on or after 01/01/15 to be under the same provisions as general state employees **<< Fiscal Note**	Barnes	Administration & Accounts	Hearing Conducted 03/05/14									
HB 1301	KC Police & Civilian Police Employees	Clarifies statutory references **<< Fiscal Note**	Neth	Retirement	Hearing Conducted 01/23/14	DP Consent 01/23/14 Rules DP Consent 02/11/14	02/20/14	02/26/14	Seniors, Families & Pensions	Hearing Conducted 04/08/14				

2014 RETIREMENT LEGISLATION

HOUSE BILLS			HOUSE ACTION						SENATE ACTION				OTHER ACTION	
Bill Number	System Affected	Description	Sponsor	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Perfected	Passed 3rd Read	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Passed 3rd Read	Notes	Governor Action
HB 1473	MOSERS	Requires a person becoming a member of the General Assembly for the first time on or after 1/1/15 to participate in a defined contribution retirement plan	Brattin	Administration & Accounts	Hearing Conducted 03/12/14 Bill Not Heard									
HB 1550	St. Louis PSRS	Requires a cost of living adjustment equal to the annual increase in the Consumer Price Index	Ellinger	Retirement										
HB 1583	MOSERS	Establishes the MO Technology Investment Fund - allows associated employees to be considered state employees for the purposes of membership in MOSERS & MCHCP **<< Fiscal Note**	Berry	Economic Development	Hearing Conducted 02/11/14	DP w/HCS 03/04/14 Ref to Rules								
HB 1682	MOSERS/ MPERS	Establishes a hybrid plan for members hired for the first time on or after 01/01/15 **<< Fiscal Note**	Koenig	Retirement	Hearing Conducted 03/13/14									
HB 1800	MOSERS/ MPERS	Allows a member who dies after benefit election but prior to annuity starting date to be considered retired and to have died on member's annuity starting date	Jones	General Laws										
HB 1821	PACARS	Extends $4 surcharge to those who pled guilty & paid a fine through a fine collection center; Adjusts monthly county contributions depending on plan funded ratio; Modifies prior service credit provisions; Excludes system from 80% funded requirement for benefit enhancements **<< Fiscal Note** ***Similar provisions in HCS HB 1231***	Diehl	Retirement	Hearing Conducted 2/27/14	DP 02/27/14 Rules DP 03/13/14	House Bills for Perfection Calendar							
HB 1830	Fire Protection Districts	Prohibits district directors from receiving retirement benefits	English											
HB 1882	All Public Plans	Relates to administrative requirements of public employee retirement plans **<< Fiscal Note**	Leara	Retirement	Hearing Conducted 03/13/14	DP w/HCS 03/13/14 Rules DP 04/03/14								

2014 RETIREMENT LEGISLATION

HOUSE BILLS			HOUSE ACTION						SENATE ACTION				OTHER ACTION	
Bill Number	System Affected	Description	Sponsor	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Perfected	Passed 3rd Read	Committee Assigned	Date/ Time Hearing Rm	Committee Action	Passed 3rd Read	Notes	Governor Action
HB 2105	MOSERS/ MPERS	Increases the state employees deferred compensation cap from $75 to $100 per month	Bernskoetter											
HB 2117	St. Louis Police & St. Louis Employee	Allows employees transferred to police department to elect retirement system participation	Leara & Roorda											
HB 2150	LAGERS	Allows political subdivisions to elect to cover emergency medical service personnel as firemen	Leara											
HB 2161	MOSERS/ CERF	Modifies composition of judicial circuits	Elmer											
HB 2200	MOSERS/ MPERS	Excludes pay in excess of the Governor's salary from the definition of pay for retirement benefit purposes for those first employed on or after 08/28/14	Wright											

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OTHER POST-EMPLOYMENT BENEFITS (OPEB)

- Employer provided benefits are often awarded to employees once those employees retire. These benefits are traditionally considered part of an employee's compensation package, payable at retirement. Such benefits may include pension benefits, retiree health insurance , life insurance, etc.

- OPEB refers to benefits received after (post) a working career has ended, **other** than an employee's pension benefit.

- OPEB are typically paid by the employer on a pay-as-you-go basis rather an actuarially funded structure similar to that used to fund pension benefits.

- The Governmental Accounting Standards Board (GASB) established standards in 1999 relative to the accounting of OPEB which were fully phased in for fiscal years ending after December 15, 2008. These standards require the disclosure of an annual OPEB cost and any unfunded actuarial accrued liability.

- JCPER staff researched State and Local government financial reports. Reports accessed represented the State of Missouri and the largest 10 municipalities and largest 10 counties.

- OPEB reporting results include, in the aggregate:

Actuarial Value of Assets:	$ 103,524,789
Actuarial Accrued Liability:	$3,687,979,041
Unfunded Actuarial Accrued Liability:	$3,584,454,252

- Approximately 39% of the aggregate Annual Required Contribution as recommended was contributed.

- GASB standards do not require the funding of the OPEB obligation however to be considered funded a trust fund must be established and dedicated for OPEB purposes.

- The MoDOT Commission and the Conversation Commission approved modifications to retiree health care benefits for those retiring on or after January 1, 2015 and January 1, 2013, respectively.

Missouri Public Retiree Health Care Information

Political Subdivision Name	Description	Date	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Annual Required Contribution	Actual Contribution	% Contributed
State of Missouri	State subsidizes retiree premium depending on retiree's years of service. The formula is 2.5% times YOS to a maximum of 65% of the premium.	6/30/2013	$ 89,500,000	$ 1,485,600,000	$ 1,396,100,000	$ 96,892,000	$ 54,006,000	56%
Dept of Conservation	Dept moved to a subsidy based on service effective retirements after 01/01/13.	6/30/2013	$ -	$ 192,190,000	$ 192,190,000	$ 12,917,000	$ 5,371,000	42%
MoDOT	Dept subsidizes premium which varies depending on options chosen by retiree. The Dept contributes approximately 47% of the premium. Dept moving to a service based subsidy for those retiring on or after 01/01/15.	6/30/2013	$ -	$ 1,082,655,000	$ 1,082,655,000	$ 104,782,000	$ 28,577,000	27%
Cities								
Columbia (City of)	Non Medicare retirees receive health care coverage through a self-insured Point of Service plan	10/1/2012	$ 2,155,000	$ 2,095,000	$ (60,000)	$ 84,286	$ 84,272	100%
Independence (City of)	Eligible retirees may participate in benefit plan options offered and are same as provided to active City employees. Coverage is available for lifetime of retiree/spouse upon payment of required reitree contribution premiums. City subsidizes premium at rate comparable to that of actives.	1/1/2011	$ -	$ 246,341,296	$ 246,341,296	$ 19,284,602	$ 6,613,000	34%

Missouri Public Retiree Health Care Information

Political Subdivision Name	Description	Date	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Annual Required Contribution	Actual Contribution	% Contributed
Kansas City (City of)	Retiree pays 100% of the same medical premium charged to active participants. Coverage terminates when covered under another employer health plan or when Medicare eligible.	5/1/2012	$ -	$ 105,013,000	$ 105,013,000	$ 9,579,000	$ 6,637,000	69%
Kansas City Board of Police Commissioners	Retirees eligible for the same benefits as active employees. Coverage terminates when covered under another employer health plan or when Medicare eligible.	5/1/2012	$ -	$ 55,129,000	$ 55,129,000	$ 6,342,000	$ 1,169,000	18%
Lee's Summit (City of)	Eligible retirees may continue health care coverage and pay a plan contribution until Medicare eligible. City pays an implicit rate subsidy through active premiums.	7/1/2011	$ -	$ 3,525,313	$ 3,525,313	$ 437,332	$ 90,000	21%
O'Fallon (City of)	Eligible retirees may participate in the health care plan at a contribution rate approved by the City Council.	12/31/2012	$ -	$ 3,057,643	$ 3,057,643	$ 354,205	$ 103,995	29%
Springfield (City of)	Beginnng 01/01/08, a high deductible plan was offered to non-Medicare retirees with the City subsidizing monthly premium by $300 and making a $1,000 annual contribution to HSA. Beginning 01/01/09, Medicare retirees are no longer eligible for coverage under City's health insurance plan.	6/30/2012	$ -	$ 21,196,454	$ 21,196,454	$ 2,091,286	$ 1,803,666	86%

Missouri Public Retiree Health Care Information

Political Subdivision Name	Description	Date	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Annual Required Contribution	Actual Contribution	% Contributed
St. Charles (City of)	Retiring prior to 02/01/12+employer contribution of 80% of premium, Retiring on or after 02/12/12=City pays a fixed dollar amount toward premium. New hires on or after 02/01/12 pay 1.5 times the COBRA	1/1/2012	$ 1,945,789	$ 17,370,000	$ 15,424,211	$ 1,347,416	$ 625,795	46%
St. Joseph (City of)	Eligible retirees may participate in City's health care plan and pay the full active member premium. The City's contribution is an implicit rate subsidy through rating retirees in with active members.	7/1/2012	$ -	$ 2,193,911	$ 2,193,911	$ 239,115	$ 87,723	37%
St. Louis (City of)	Police Dept eligible retirees may receive health care with dept paying full cost of a base healthcare plan and retirees may elect to pay to buy-up a plan for excess coverage	7/1/2011	$ -	$ 443,392,000	$ 443,392,000	$ 39,297,000	$ 9,909,000	25%
St. Peters (City of)	Eligible retirees may participate in City's health care plan. The City contributes to the plan on a pay-as-you-go basis with an additional amount to prefund benefits.	10/1/2012	$ 9,924,000	$ 25,156,000	$ 15,232,000	$ 2,063,000	$ 994,000	48%
Counties								
Boone County	Retiree required to pay the same premiums charged to active participants. Coverage terminates upon Medicare eligibility.	12/31/2012	$ -	$ 477,600	$ 477,600	$ 59,800	$ 65,604	110%

Missouri Public Retiree Health Care Information

Political Subdivision Name	Description	Date	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Annual Required Contribution	Actual Contribution	% Contributed
Clay County	Retiree is required to pay carrier-charged premium. Coverage ceases upon Medicare eligibility.	1/1/2010	$ -	$ 1,091,200	$ 1,091,200	$ 132,165	$ 58,000	44%
Greene County	Upon payment of required contributions, retirees may continue health care coverage until Medicare eligiblity.	7/1/2011	$ -	$ 1,495,624	$ 1,495,624	$ 240,069	$ 52,000	22%
Total			**$ 103,524,789**	**$ 3,687,979,041**	**$ 3,584,454,252**	**$ 296,142,276**	**$ 116,247,055**	**39%**

Internet Links for Retiree Health Care Information

State of MO CAFR 2013 –
http://content.oa.mo.gov/sites/default/files/CAFR_2013.pdf

Columbia (City of) 2013 CAFR -
http://www.gocolumbiamo.com/Finance/Services/Financial_Reports/FY2013_CAFR/index.php

Independence (City of) CAFR 2013 -
http://www.ci.independence.mo.us/userdocs/finance/budgetDownloads/2013/2012-13FinancialReport.pdf

Kansas City (City of) CAFR 2013 -
http://www.kcmo.org/idc/groups/finance/documents/finance/cafr_fy13.pdf

Lee's Summit (City of) CAFR 2013 -
http://cityofls.net/LinkClick.aspx?fileticket=EAyua0iihsg%3d&tabid=576

O'Fallon CAFR 2012 - http://www.ofallon.mo.us/images/pubs/finance/2012CAFR.pdf

Springfield (City of) CAFR 2013 - http://www.springfieldmo.gov/budget/pdfs/2013CAFR.pdf

St. Charles (City of) CAFR 2012 -
http://www.stcharlescitymo.gov/Portals/0/Finance%20Dept/City%20of%20Saint%20Charles%20-%20CAFR%20-%20FINAL%202012.pdf

St. Joseph (City of) CAFR 2013 - http://www.stjoemo.info/ArchiveCenter/ViewFile/Item/219

St. Louis (City of) CAFR 2013 –
https://stlouis-mo.gov/government/departments/comptroller/documents/loader.cfm?csModule=security/getfile&pageid=381132

St. Peters CAFR 2013 -
http://www.stpetersmo.net/_Finance/City%20of%20St.%20Peters%20-%20CAFR%20-%20FINAL.pdf

Boone County CAFR 2012 -
https://www.showmeboone.com/auditor/common/pdf/BooneCounty2012cafr.pdf

Clay County Financial Statements 2011 -
https://www.claycountymo.gov/@api/deki/files/2054/=2011_Financial_Statements_(FINAL).pdf – Clay

Greene County Actuarial Valuation – see attached

GREENE COUNTY

POSTRETIREMENT HEALTH INSURANCE FINANCIAL INFORMATION

UNDER GASB 45

BASED ON A
VALUATION DATE OF JULY 1, 2011

JUNE 2012

L&E
Actuaries &
Consultants

LEWIS & ELLIS, INC.
OVERLAND PARK, KS

Dallas
Glenn A. Tobleman, F.S.A., F.C.A.S.
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Cabe W.C hadick, F.S.A.
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June 6, 2012

Greene County
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940 North Boonville Avenue
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This report presents actuarial information in accordance with GovernmentalA ccounting Standards Board Statement No. 45 regarding the health insurance benefits available to retirees of Greene County (the County). Throughout this report former employees electing "retiree" coverage are referred to as retirees. The purpose of this report is to:

- Present information that provides a basis for financial statement disclosure, and
- Determine the Annual OPEB Cost for fiscal year beginning January 1, 2011.

The valuation has been conducted in accordance with generally accepted actuarial principles and practices. Employee data, historical claim data, and plan descriptions were furnished byt he County, Midwest Public Risk and its vendors. The data provided has been reviewed for reasonableness, but no attempt has been made to audit such information. The valuation is based on the substantive plan as of the time of the performance of this valuation. The substantive plan refers to the plan provisions that operate in practice. Each actuarial assumption used in this valuation is reasonably related to past experience of the covered group and represents reasonable expectations of future experience.

The undersigned is a member of the American Academy of Actuaries and meets the qualification standards of the Academy to render the actuarial information contained herein.

Respectfully submitted,

LEWIS & ELLIS, INC.

Patrick Glenn

Patrick Glenn, ASA, ACAS, MAAA, CPA (inactive)

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SUMMARY

Thev aluation procedures noted below and information presented in this report are based on provisions underlying Government Accounting Standards Board (GASB)S tatement 45. GASB stipulates the excess of expected costs by age less retiree contributions equals the employer benefit that forms the basis for the valuation. The amount of annual expense accrual under GASB is equal to the AnnualO PEB Cost. The offsetting liability, called the NetO PEB Obligation, is reduced by the amount of employer benefits provided to retirees during the year.

VALUATION PROCEDURES

The financial information for fiscal year 2011 is based upon an actuarial valuation performed as of July 1, 2011 using the participant census as of July 1, 2011. We assume the County will implement GASB 45 in fiscal year 2011.

SUBSTANTIVE PLAN

Greene County provides for retiree Medical and Dental coverage to qualifying former employees through Midwest Public Risk (MPR), a public-entity risk pool. MPR functions as an agent multiple-employer plan. Therefore, a separate valuation is required for each entity member offering retiree coverage that follows accrual accounting.

Retirees and their spouses may obtain Medical coverage until Medicare eligibility by paying required premium rates. Upon retiree death or attainment of age 65 spouses may continue coverage for up to three years not to exceed to their own age 65. The required premium rates are based to some degree on combined active and retiree experience so retirees are not charged the full age-based projected cost.

FUNDING OF BENEFITS

Health insurance claims and administrative costs of the pool are paid from the MPR Health & Dental Fund (Fund). Retiree benefits are indirectly paid by entity members through higher active premiums into the Fund. Over time, active premiums would be lower if retirees were not part of the covered group.

It has been determined the Fund does not qualify as an "OPEB plan" for GASB 45 reporting purposes. Thus, assets of the Fund cannot be reported as an offset to GASB 45 liabilities. However,t he assets of the Fund should be used as the primary source for determining the valuation interest rate.

The valuation interest rate (or discount rate) should equal the estimated long-term investment yield on the source of assets used to provide for the payment of benefits. Based on an analysis of long-term experience of comparable asset classes anticipated to be held by the Fund, an expected long-term return of 5.00% is assumed for valuation. The prior valuation assumed a return of 5.75%.

RESULTS

The financial results are shown on pages 4 and 5.

Annual OPEB Cost consists of theN ormal Cost plus amortization of the Actuarial Accrued Liability (AAL). The Normal Cost is the amount of Actuarial Present Value of Benefits allocated to thec urrent year as determined under thea pplicableac tuarial cost method. The amount of AAL is the portion of the Actuarial Present Value of benefits allocated to all prior ycars. The actuarial cost method is a procedure to allocate present value costs to different time periods. The projected unit credit actuarial cost method has been utilized for allocation.

We have used a 30 year, open-period, level-dollar, amortization methodology to amortize the AAL. Thirty years is the maximum allowable number of years for amortizing the AAL. While only a portion of the AAL is currently recognized, the full amount of AAL must be disclosed. The ActuarialP resent Value of Benefits is shown for informational / instructional purposes only; it is not required to be disclosed or recognized.

The actual AAL may differ from expected due to experience gains/losses and changes in plan provisions, assumptions and/or actuarial methods. Example sources of experience gains include lower retirements than assumed and lower medical inflation than assumed. Examples of experience losses include lower turnover than assumed and less increase in retiree contribution premiums than assumed.

The major impacts relative to the last valuation for MPR members are shown below:

- The assumed Medical / Rx trend rates were changed from 10%, 9.5%, 9%, 8.5%, 8%, 7.5%, 7%, 6.5%, 6%, 5.5% (Ultimate) to 8.5%, 8%, 7.5%, 7%, 6.5%, 6%, 5.5%, 5% (Ultimate). The assumed Dental trend was lowered from 5.0% to 4.0%.
- The turnover rates and retirementa ge assumptions were updated to reflect the latest statistics available from the applicable statewide pension valuations.
- The assumed enrollment rate for future retirees was lowered from 55% to 45% for those retiring at ages 55 to 59, from 40% to 35% for those retiring prior to age 55, and from 70% to 55% for those retiring at ages 60 to 64.
- The valuation interestra te was lowered from 5.75% to 5.00% based on our analysis and correspondence with thei nvestment advisor of MPR concerning anticipated asset allocation and expected returns of the Health & Dental Fund.
- Expected Medical/Rx costs and retiree premiums each increased about 10% per year.

RESULTS *(CONTINUED)*

- The assumed proportion of future retirees with a covered spouse was lowered from 40% to 30%.
- The disability load cost factor was increased from 1.25 to 1.50.
- The attribution method was changed from linear to eligibility **to** linear to expected decrement as allowed under GASB 45.
- The Dental aging slope cost curve was revised slightly.

FUTURE REPORTING

The next updated valuation is required to cover fiscal years 2013 and 2014 and should be based on a valuation date of July 1, 2013. The current valuation covers fiscal years 2011 and 2012. The Annual Required Contribution for interim year 2012 will remain at $240,069 but the Annual OPEB Cost will change. After the implementation year, the Annual Required Contribution (ARC) and Annual OPEB Cost do not equal due to two adjustments. These are the interest cost and the ARC adjustments. The Net OPEB Obligation at any point in time equals the accumulated Annual OPEB Cost minus accumulated net employer contributions since implementation of GASB 45.

The Net Employer Contributions equals retiree costs minus premiums received from retirees. The expected Net Employer Contributions, based on the July 1, 2011 valuation, for fiscal year 2012 is shown below.

A. Expected Retiree Costs	$172,000
B. Expected Retiree Contribution Premiums	115,000
C. Expected Net Employer Contributions (A-B)	$ 57,000

ANNUAL OPEB COST FOR 2012

A.	Actuarial Present Value of Benefits	
	Current Retirees	138,456
	Future Retirees	3,154,231
		3,292,687
B.	Actuarial Accrued Liability	
	Current Retirees	138,456
	Future Retirees	1,357,168
		1,495,624
C.	OPEB Plan Assets	0
D.	Unfunded Actuarial Accrued Liability (B - C)	1,495,624
E.	Amortization Factor (Based on 30 Year Open-Level Dollar)	16.14107
F.	Amortization of Unfunded	94,948
G.	Normal Cost	145,121
H.	Annual Required Contribution (ARC) (F + G)	240,069
I.	Net OPEB Obligation at Beginning of Year	0
J.	Interest on Net OPEB Obligation to end of year (I x .05)	0
K.	Adjustment to the ARC (I / E)	0
L.	**Annual OPEB Cost (H + J - K)**	**240,069**
M.	Valuation Interest Rate	5.00%
N.	Measurement Date	July 1, 2011

GASB 45 Disclosure Information

1. Annual OPEB Cost for 2011

A. Normal Cost	145,121
B. Amortization of Unfunded Actuarial Accrued Liability	94,948
C. Annual Required Contribution (ARC)	240,069
D. Interest on Net OPEB Obligation	0
E. Adjustment to the ARC	0
F. Annual OPEB Cost (C + D – E)	240,069

2. Expected Employer Contributions for 2011 *

A. Expected Retiree Claims & Fixed Costs	158,000
B. Expected Retiree Contributions	106,000
C. Expected Employer Contributions (A - B)	52,000

* Estimate based on current retirees and projected future retirees.

3. Schedule of Employer Contributions

Fiscal Year Ending December 31

Year Ending	Annual OPEB Cost	Expected Employer Contributions	Percentage Contributed	Net OPEB Obligation
2011	240,069	52,000	21.7%	188,069

4. Net OPEB Obligation at 12/31/2011

A. Balance at 12/31/2010	0
B. Annual OPEB Cost for 2011	240,069
C. Employer Contributions for 2011	52,000
D. Balance at 12/31/2011 (A + B - C)	188,069

5. Schedule of Funding Progress

Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percent Of Covered Payroll ((b-a)/c)
7/1/2011	0	1,495,624	1,495,624	0%	23,837,704 (A)	6.3%

(A) Annualized Pay of Active Employees as of 7/1/2011 eligible to participate in health plan.

RESULTS BY ACCOUNTING FUND

Accounting Fund	Number of Employees	Number of Retirees / Spouses
General	408	0
SR911	1	0
SRAssessor	26	0
SRCCW	1	0
SRLestJail	75	0
SRLESTJuvenile	7	0
SRLestPA	7	0
SRLestSheriff	12	0
SRPA Bad Check	3	0
SRParks	5	0
SRRoad & Bridge	114	0
SRSheriff Grant	3	0
Retiree	0	17
Total	662	17

Accounting Fund	Actuarial Accrued Liability	Annual OPEB Cost	Net OPEB Obligation
General	853,475	140,597	107,712
SR911	14	24	4
SRAssessor	37,698	6,872	4,829
SRCCW	197	110	33
SRLestJail	60,409	18,485	8,548
SRLESTJuvenile	4,407	1,062	593
SRLestPA	5,164	1,191	689
SRLestSheriff	30,952	5,501	3,950
SRPA Bad Check	295	320	67
SRParks	8,361	1,897	1,111
SRRoad & Bridge	353,929	54,559	44,261
SRSheriff Grant	2,267	661	317
Retiree	138,456	8,790	15,955
Total	1,495,624	240,069	188,069

PARTICIPANT DATA

Data on participants electing healthcare coverage was provided by Midwest Public Risk and Greene County. A summary of participants for the current and prior valuation is presented here.

PARTICIPANT SUMMARY	Census as of July 1, 2011
Active Employees	
General Employees	411
Police & Fire	251
Total Count	662
Average Age – General Employees	45.1 years
Average Service – General Employees	8.9 years
Average Age – Police & Fire	38.7 years
Average Service – Police & Fire	6.9 years
Current Benefit Recipients	
Retirees	15
Spouses	2
Total Count	17
Average Attained Age - Retirees	62.3 years

MEDICAL COVERAGE TIER AS OF JULY 1, 2011

	Single	Single + Children	Single + Spouse	Family	Waived	Total
Active Coverage	526	65	38	17	16	662
Retiree Coverage	13	0	2	0	0	15
	539	65	40	17	16	677

MEDICAL COVERAGE PLAN AS OF JULY 1, 2011

	Plan A	Plan B	Plan R	HMO	High Deductible	Waived	Total
Active Coverage	38	594	0	0	14	16	662
Retiree Coverage	0	8	6	0	1	0	15
	38	602	6	0	15	16	677

SUMMARY OF PLAN PROVISIONS

Greene County provides for continuing health insurance coverage to former employees (and their dependents) electing retiree coverage through the health insurance program of Midwest Public Risk (MPR), a public entity risk pool. Below is a summary of the provisions of the healthcare program utilized in completing the valuation.

PLAN OF OPERATION

The program of MPR offers six medical plans including: four PPO plans (Plans A, B, R and a High Deductible option) and two HMO plans. Plan R is not available to active employees. Medical and Dental coverage are structured through self-insured arrangements, with stop-loss coverage for Medical. The plan renewal year runs from July 1 to June 30.

Upon payment of required contributions, participants may continue retiree coverage until becoming eligible for Medicare, which is currently age 65. Spousal coverage may continue foru p to three years upon retiree death or retiree attainment of age 65. In any event, spousal coverage is not available beyond spouse age 65. Dental coverage is available for life. A participant may not enroll in retiree coverage after once declining coverage.

ELIGIBILITY

In order to continue coverage under the above provisions, an electing former employee must achieve the following criteria:

- Not be eligible for Medicare; and
- Apply for Retiree coverage within 31 days of termination; and
- Have worked as a qualifying continuous "full-time" employee; and
- Attained at least 10 years ofc ontinuous service, among MPR entity members, immediately preceding the date of termination.

Pension eligibility under the Missouri Local Government Employees Retirement System (LAGERS) is shown below for reference.

Category	Pension Eligibility	
	Unreduced Retirement	Reduced Early Retirement
General Employees	60 & 5	55 & 5
	Rule of 80*	
Police & Fire Employees	55 & 5	50 & 5
	Rule of 80*	

* Employer must elect.

ELIGIBILITY *(CONTINUED)*

Pension eligibility under the County Employees' Retirement Fund is shown below for reference.

Normal Retirement – Age 62 and 8 years of service
Early Retirement – Age 55 and 8 years of service

BENEFITS

The contribution premium rates for retiree coverage utilized as the starting basis for the valuation are those that apply for the plan renewal year starting July 1, 2011. They are shown below on an annual basis.

MISSOURI

		Spouses of	
Coverage	Retiree	Covered Retirees	Non-Covered Retirees*
Plan A	$7,980	$10,380	$6,512
Plan B	6,168	8,004	5,031
Plan R	5,196	6,756	5,196
HMO – Buy Up	6,468	8,808	5,275
HMO – Base	6,048	8,244	4,933
HDHP	5,292	6,888	4,321
Dental	468	708	379

* Cobra rate applies when a retiree participant dies or turns age 65.

Retiree rates for medical, weighted by assumed plan participation, increased about 10% per year since the last valuation.

PLANS NOT OFFERED

The County does not offer Dental coverage and the two HMO plans to retirees. The valuation calculations reflect this.

COST ANALYSIS BY AGE

The benefit that is valued under GASB 45 equals the expected age-adjusted cost (sample ages shown below) less the retiree contribution premium. Age-adjusted costs are the estimated average costs that would result if a credible-size group of like-age participants was measured.

A benefit to retirees may exist even when retirees must pay 100% or more of the "full" premium. This is because the retiree premium rates may be based on expected claims of the entire covered group (actives and retirees), which includesy ounger memberst hat drive the composite average down. Unless retirees are charged the full age-based cost, the employer is providing a benefit that must be valued under GASB 45. Over time, active premiums that are directly paid by member entitiesw ould be somewhat lower if retirees were not part of the covered group. Thus, retiree benefits exist as an indirectly paid benefit.

Medical, Rx and Dental claim experience from July 2008 to October 2011 was studied for each plan option offered through Midwest Public Risk. A combination ofr etiree experience and age-adjusted active plan experience was utilized to determine expected claims by age. The active plan experience was age-adjusted by fitting industry relativities to the age distribution of the pool. Expected administrative costs and stop-loss premiums, based on vendor contract rates, were combined with expected claims to complete the per-capita cost estimates. Our estimate of age-adjusted costs for 2011/2012, on a per member per year basis, is shown below at sample ages. These cost levels and the retiree premiums shown on page 9 serve as a starting point for the valuation.

Expected Cost Levels (PMPY)

	Medical Plan					
Age	Plan A	Plan B	Plan R	HMO	HDHP	Dental
50	6,765	5,484	6,216	4,812	4,203	336
55	8,340	6,744	7,656	5,892	5,148	372
60	10,125	8,172	9,288	7,116	6,219	412
62	10,860	8,760	9,960	7,620	6,660	430
64	11,490	9,264	10,536	8,052	7,038	448

Expected medical costs, weighted by assumed plan participation, increased about 10% per year since the last valuation.

ACTUARIAL ASSUMPTIONS

A. Valuation Interest Rate

5.00%

B. Valuation Date

July 1, 2011

C. Medical/Rx Cost Trend (and Retiree Contribution Trend)

Year From Measurement Date	Increase Over Prior Year
1	8.50%
2	8.00%
3	7.50%
4	7.00%
5	6.50%
6	6.00%
7	5.50%
8 (To Ultimate)	5.00%

D. Dental Cost Trend (and Retiree Contribution Trend)

4.00% per year

E. Age Adjusted Costs

The estimated age-adjusted cost for retiree insurance coverage during 2011/2012 at samplea ges is shown on page 10. Disabled participants not on Medicare are assumed to cost 1.5 times the cost of non-disabled participants.

F. Future Retiree Enrollment

Participation in coverage for future retirees is assumed to differ based on age at retirement.

Age at Retirement	Enrollment
Less than 55	35%
55 to 59	45%
60 to 64	55%

Fiftyp ercent (50%) of the above rates are assumed to apply to those currently waiving Medical and Dental coverage.

G. Participation in Dental Coverage for Future Retirees

Seventy percent (70%) of those who participate in retiree medical coverage are assumed to elect Dental.

H. Medical Plan Elections

Actual current plan elections were valued for current retirees. Future retirees are assumed to electp lan options weighted according to the following distribution:

Plan	Proportion
A	10%
B	10%
R	50%
HMO	25%
High Deductible	5%

The above assumed distribution is adjusted when all of the options are not offered.

I. Healthy Life Mortality

Assumed mortality is based on the RP-2000 Mortality Table. Illustrations of assumed annual rateso f mortality are shown in the table below for selected ages:

Age	Males	Females
30	.04%	.03%
40	.11%	.07%
50	.21%	.17%
60	.67%	.51%

J. Disabled Life Mortality

Assumed mortality for disabled members is based on the RP-2000 Disabled Life Mortality. Illustrations of the assumed annual rates of mortality are shown in the table below for selected ages:

Age	Males	Females
30	2.26%	.75%
40	2.26%	.75%
50	2.90%	1.15%
60	4.20%	2.18%

K. Retirement Age

Assumed rates are based on those used for the LAGERS pension actuarial valuation. Retirement rates project the annual probability of retiring for eligible employees. For "Rule of 80" rates to apply, age plus years of service must be ≥ 80, and the employer must elect the "Rule of 80" option.

Rule of 80

Age(s)	General Members		Police	Fire
	Men	Women		
50-51	0.150	0.150	0.250	0.250
52-58	0.150	0.150	0.150	0.150
59	0.150	0.150	0.150	0.200
60	0.150	0.150	0.150	0.300
61	0.150	0.150	0.250	0.300
62-63	0.300	0.150	0.300	0.450
64	0.300	0.200	0.300	0.450
65	0.300	0.250	1.000	1.000
66-69	0.300	0.250		
70+	1.000	1.000		

No Rule of 80

Age(s)	General Members		Police	Fire
	Men	Women		
50-54	N/A	N/A	0.030	0.025
55-56	0.025	0.030	0.100	0.150
57	0.025	0.030	0.100	0.100
58-59	0.025	0.030	0.100	0.150
60	0.100	0.100	0.100	0.200
61	0.100	0.100	0.100	0.100
62	0.250	0.150	0.250	0.300
63	0.250	0.150	0.200	0.300
64	0.200	0.150	0.200	0.250
65	0.250	0.200	1.000	1.000
66	0.250	0.250		
67-68	0.200	0.200		
69	0.200	0.150		
70+	1.000	1.000		

L. Turnover Incidence (Other than Retirement)

Assumed turnover rates are based on rates used for the LAGERS pension actuarial valuation. Turnover rates are not applied when retirement eligibility is achieved. Illustrations of annual rates of turnover are shown below at sample ages and levels of service:

Police

	Years of Service				
Age	0-1	1-2	2-3	3-4	4-5
All Ages	.18	.17	.16	.13	.12

	Years of Service > 5
Age	Rate
25	.101
30	.080
35	.061
40	.047
50	.018

Fire

	Years of Service				
Age	0-1	1-2	2-3	3-4	4-5
All Ages	.08	.07	.06	.06	.05

	Years of Service > 5
Age	Rate
25	.050
30	.040
35	.028
40	.022
50	.010

General

		Years of Service				
Gender	Age	0-1	1-2	2-3	3-4	4-5
Male	All Ages	.18	.16	.14	.11	.09
Female	All Ages	.21	.20	.16	.13	.12

	Years of Service > 5	
Age	Male	Female
25	.075	.107
30	.065	.094
35	.051	.072
40	.038	.055
50	.024	.034

M. Disability Incidence

Assumed disability rates are based on rates used for the LAGERS pension actuarial valuation. Illustrations of annual rates of disability are shown below at sample ages:

			General	
Age	Police	Fire	Male	Female
30	0.0010	0.0007	0.0019	0.0002
40	0.0020	0.0023	0.0032	0.0006
45	0.0031	0.0037	0.0042	0.0012
50	0.0052	0.0057	0.0054	0.0025
55	NA	NA	0.0071	0.0047

N. Future Spousal Participation

Thirty percent (30%) of future participating retirees are assumed to have a covered spouse. Actual spouse elections were valued for current retirees.

O. Spouse Age Difference

Males are assumed to be 3 years older than their female spouses for future retirees. Actual spouse age was valued for spouses of current retirees.

P. Medicare Eligibility Age

Age 65

Q. Timing of Claim Payments

Mid-year

R. Non-Spouse Dependents

Deemed immaterial and not valued.

S. Duration of Coverage

Upon retirement, participants are assumed to elect coverage to age 65. Upon covered retiree death or attainment of age 65, a covered spouse is assumed to elect up to three years of coverage not to exceed their own age 65.

ACTUARIAL METHODS

A. POPULATION VALUED

The valuation is based on a closed group. Covered retirees and current employees as of the valuation date of July 1, 2011 are considered; no provision is made for future hires.

B. ACTUARIAL COST METHOD -- PROJECTED UNIT CREDIT ACTUARIAL COST METHOD

The actuarial calculations were performed in accordance with the Projected Unit Actuarial Cost Method as allowed under Governmental Accounting Standard No. 45 (GASB 45).

- Benefits are projected and the actuarial present value of benefits is determined for each individual included in the actuarial valuation. Benefits are earned over the period from date of hire to expected decrement and are allocated as follows:

  a. all valuation years preceding the measurement date;

  b. the current valuation year; and

  c. all subsequent valuation years.

- The sum of the actuarial present values of benefits allocated to the current valuation year determined above for all individuals is the Normal Cost for the valuation year.

- The sum of the actuarial present values of benefits allocated to all valuation years preceding the valuation date determined above is the Actuarial Accrued Liability (AAL). The excess of the AAL over the actuarial value of plan assets is the unfunded AAL.

C. AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

The Unfunded Actuarial Accrued Liability is amortized over 30 years as a level-dollar, open-period amortization basis.

D. ANNUAL REQUIRED CONTRIBUTION (ARC)

The sum of the Normal Cost and the amortization of the Unfunded Actuarial Accrued Liability comprise the ARC.

E. ANNUAL OPEB COST

The Annual OPEB Cost equals the Annual Required Contribution when reporting for the GASB 45 implementation year. After the implementation year, the Annual OPEB Cost consists of the following components:

(i) Annual Required Contribution (ARC)
(ii) Interest on the Net OPEB Obligation
(iii) Adjustment to the ARC

F. ACTUARIAL VALUE OF ASSETS

Insurance coverage for former employees electing retiree coverage is provided through Midwest Public Risk (MPR), a risk pool of public entities. MPR functions as an agent multiple-employer plan. The Health and Dental Fund of MPR collects premiums and paysc laims / administrative costs. It is our understanding the Fund does not qualify as an "OPEB Plan" and thus cannot be treated as holding assets in order to offset GASB 45 liabilities.

G. CALCULATION OF PRESENT VALUES

Using the actuarial assumptions, the number ofre tired participants is projected each year in the future. Costsare projected for each future year at each age using the trend and aging assumptions. The projected costs less projected retiree contributions are multiplied by the expected number of retirees in each future year to produce expected benefits payments. These payments are then discounted using the valuation interestra te to determine the present value of the projected liabilities.

The actuarial calculations reflect a long-term perspective that involves estimates of reported amounts and assumptions about the probability of events far into the future. Actuarially determined amounts are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future. The actuarial calculations are based on the substantive plan and pertinent law as they exista tt he time of the preparation of this valuation study. The substantive plan is the plan that operates in practice.

H. GASB 45 REPORTING CYCLE

It is assumed future reporting will be based on updated valuations completed every two years.

GLOSSARY

ActuarialA ccrucd Liability (AAL). Thatpo rtion, as determined by a particular Actuarial Cost Method, of the ActuarialP resentV alue of plan benefits which is allocated to periods prior to the valuation date.

Actuarial Cost Method. A procedure for allocating the Actuarial Present Value of plan benefits to time periods, usually in the form of a Normal Cost and Actuarial Accrued Liability.

Actuarial Present Value. The value of an amounto r series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of actuarial assumptions, and plan provisions. Actuarial Present Value takes into account the probability of payment as well as the time value of money.

Adjustment to the ARC. An adjustment made to Annual OPEB Costt o avoid double counting of the Amortization of the AAL when full funding of the ARC does not occur.

Amortization Payment. That portion oft he Annual Required Contribution that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Annual OPEB Cost. The amount of expense an employer must recognize in accordance with a Defined Benefit OPEB Plan, calculated in accordance with the parameters.

Annual Required Contribution (ARC). The portion of expense an employer must recognize in accordance with a Defined Benefit OPEB Plan equal to the Amortization Payment plus the Normal Cost,ca lculated in accordance with the assumptions and plan provisions.

Defined Benefit OPEB Plan. An OPEB plan having terms that specify the amount of benefits to be provided at a future date or after a certain period of time. The amount specified usually is a function of one or more factors such as age and years of service.

Healthcare Cost Trend Rate. The rate of change in per capita health claims cost over time as a result of factors such as medical inflation, utilization of healthcare services, plan design and technological developments.

Net OPEB Obligation. The cumulative difference since the effective date of GASB 45 between Annual OPEB Cost and the employer's contributions in relation to the Annual Required Contribution (ARC). Ane mployer has made a contribution in relation to the ARC if the employer has (1) made payments of benefits directly to or on behalf of a retiree, (2) made premium payments to an insurer on behalfo f a retiree, or (3) irrevocably transferred assets to a qualifying trust.

Normal Cost. That portion of the Actuarial Present Value of OPEB plan benefits that is allocated to a valuation year by the Actuarial Cost Method.

GLOSSARY

Other Postemployment Benefits (OPEB). Postemployment benefits other than pension. OPEB includes PostemploymentH ealthcare Benefits, regardless of the type of plan that provides them, and all postemployment benefits provideds eparately from a pension plan, excluding benefits defined as termination offers and benefits.

Postemployment Healthcare Benefits. Medical / Rx, Dental, Vision and other health-related benefits provided to retired employees and their dependents and beneficiaries.

Substantive Plan. The terms of the OPEB plan as understood by the employer and plan members.

Unfunded Actuarial Accrued Liability. The excess, if any, of the Actuarial Accrued Liability over the assets of the plan.

Valuation Interest Rate (or Discount Rate). The expected long-term rate of return on the source of assets used to pay retiree insurance benefits.

Estimated Fringe Benefit Contribution Rates
(not applicable for judges)
FY15 Gov Rec

For Estimation Uses Only

	FY 2015		FY 2014
	Personal Service	Overtime Calculation	Supple-mental
SOCIAL SECURITY	7.65%	7.65%	7.65%
RETIREMENT-MOSERS	16.97%	16.97%	16.98%
LONG-TERM DISABILITY-MOSERS	0.495%	0.495%	0.495%
BASIC LIFE INSURANCE (ACTIVES)-MOSERS	0.32%	0.32%	0.32%
BASIC LIFE INSURANCE (RETIREES)-MOSERS	0.115%	0.115%	0.115%
MEDICAL INSURANCE (ACTIVES)-MCHCP	22.70%	0.00%	21.27%
MEDICAL INSURANCE (RETIREES)-MCHCP	4.30%	0.00%	4.06%
UNEMPLOYMENT COMPENSATION	0.16%	0.00%	0.16%
WORKERS' COMPENSATION	1.58%	0.00%	1.58%
TOTAL	**54.29%**	**25.55%**	**52.63%**
DEFERRED COMPENSATION-MDCIP*	1.62%	0.00%	0.00%
OPEB	2.21%	0.00%	0.00%
GRAND TOTAL	**58.12%**	**25.55%**	**52.63%**

*Based on employee contributing a minimum of $50/month

Thomas A. Schweich
Missouri State Auditor

CITIZENS SUMMARY

Findings in the audit of Reemployment of State Retirees

Background

This audit reviewed issues associated with state retirees reemployed in state government positions and procedures to ensure compliance with state laws regarding reemployment of retirees. Most full-time state employees participate in defined-benefit public employee retirement plans. General state employees participate in plans operated by the Missouri State Employees' Retirement System (MOSERS) and employees of the Missouri Department of Transportation and the Missouri State Highway Patrol participate in plans operated by the Missouri Department of Transportation and Highway Patrol Employees' Retirement System (MPERS). State laws permit the reemployment of state retirees in state government benefit eligible and non-benefit eligible positions. When reemployed in a non-benefit eligible position, the retiree receives no employment benefits, the reemployment has no impact on an individual's retirement payments, and the retiree receives a monthly retirement payment in addition to compensation for work performed. To be benefit eligible, the employee must be assigned to a position that normally requires the performance of duties during not less than 1,040 hours per year. Currently, state law requires most retirees' retirement payments be suspended while the retiree is actively reemployed in a benefit eligible position.

According to various state agency and retirement system personnel, there are both benefits and costs associated with reemploying retirees. During the 2 years ended December 31, 2012, at least 1,662 state retirees worked as employees in state government positions. During this period, 189 of these retirees were reemployed in full-time, benefit eligible positions; 1,487 were reemployed in part-time, non-benefit eligible positions; and 14 were reemployed in both types of positions. In addition, at least 15 state agencies utilized 132 retirees as vendors during the 2 years ended December 31, 2012.

Statewide Oversight of Reemployed Retirees

There is no statewide oversight of retirees rehired in state government positions, and our review noted instances of noncompliance with reemployment restrictions and incorrect benefit eligibility classifications. Personnel of the various state agencies are responsible for classifying benefit eligibility and tracking and monitoring reemployments of retirees, but procedures used are not always sufficient. Several state agencies that reemployed a significant number of retirees do not fall under Office of Administration (OA) oversight and OA has provided no guidance for ensuring proper benefit eligibility classification.

State Law Allowing Retirement Payments while Reemployed Full-Time in Benefit Eligible Positions	State law pertaining to certain plans allows some retirees reemployed in full-time state government positions to receive their retirement payments while reemployed. Thirty-one of the 189 retirees working in full-time benefit eligible state positions drew wages and retirement payments simultaneously, receiving $2.8 million in retirement payments in addition to $3.1 million in wages during the 2 years ended December 31, 2012. By providing these retirees with wages and retirement payments simultaneously, the state is providing extra compensation to a small select group of state employees, which is generally prohibited for most state employees. Many current and future retirees of certain plans could similarly avail themselves of these provisions.
Retirees Reemployed Part-Time in Non-Benefit Eligible Positions	Many state agencies lacked adequate procedures to ensure retirees reemployed part-time are properly classified. Some reemployed retirees may have been incorrectly classified as part-time, and therefore received their retirement payments while reemployed, when not eligible to do so. Audit staff found 107 of the 1,487 (7 percent) retirees working in part-time, non-benefit eligible positions worked 1,040 or more hours during their anniversary year(s). When a retiree working in a non-benefit eligible position works 1,040 hours or more in a year, agencies should determine whether (1) the employee has exceeded this limit due to short-term, unforeseen circumstances and should continue to be classified as non-benefit eligible, or (2) the position has effectively changed and should be reclassified as benefit eligible. Our review noted numerous weaknesses and inconsistencies among state agency procedures. Several state agencies had centralized procedures or tracking systems to monitor actual hours worked by part-time retirees, while some state agencies delegated monitoring procedures to individual divisions or units within their agencies. Two state agencies tracked hours separately by position, which appears to violate state law when collectively the positions require 1,040 or more hours; state agencies defined work year inconsistently and did not always comply with state law; and some state agencies had established hour maximums other than the maximum provided by state law. State laws do not require a standard or minimum separation period between retirement and reemployment.
Retiree Vendors	State laws and regulations that address hiring retirees as vendors are inadequate, and most state agencies lacked adequate procedures to ensure these vendor arrangements are proper. Several retirees were hired as vendors when it appears they should have been classified as full-time, benefit eligible employees; and, as a result, these retirees received retirement payments that would have been suspended if they had been classified as employees.

Because of the compound nature of this audit report, no overall rating is provided.

Joint Committee on Public Employee Retirement
Quarterly Reports
2013 Fourth Quarter

Plan Name	Beg. Market Value	End. Market Value	ROR 12 mos.	ROR 36 mos.	ROR 60 mos.
Affton FPD Retirement Plan	$6,225,677	$6,839,638	18.41% (Net)	9.20% (Net)	10.49% (Net)
Antonia FPD Pension Plan	$1,709,458	$1,756,379	unavailable% (Gross)	unavailable% (Gross)	unavailable% (Gross)
Arnold Police Pension Plan	$9,005,346	$9,569,408	22.8% (Net)	12.7% (Net)	14.0% (Net)
Bi-state Dev Agency Division 788, A.T.U.	$103,536,543	$110,820,514	N/A% (Net)	N/A% (Net)	N/A% (Net)
Bi-state Development Agency Local 2 I.B.E.W.	$2,690,813	$2,919,025	N/A% (Net)	N/A% (Net)	N/A% (Net)
Bi-state Division 788 Clerical Unit ATU	$5,365,533	$5,722,942	N/A% (Net)	N/A% (Net)	N/A% (Net)
Bi-state Salaried Employees	$52,153,015	$54,854,242	N/A% (Net)	N/A% (Net)	N/A% (Net)
Black Jack FPD Retirement Plan	$10,247,654	$10,296,331	1% (Net)	1% (Net)	1% (Net)
Bothwell Regional Health Center Retirement Plan	$44,492,122	$46,745,162	14.8% (Net)	9.5% (Net)	12.5% (Net)
Brentwood Police & Firemen's Retirement Fund	$29,544,709	$31,222,778	N/A% (Gross)	N/A% (Gross)	N/A% (Gross)
Bridgeton Employees Retirement Plan	$23,859,809	$25,278,995	18.66% (Gross)	10.51% (Gross)	12.28% (Gross)
Carthage Policemen's & Firemen's Pension Plan	$6,054,635	$6,288,542	13.09% (Net)	8.12% (Net)	8.24% (Net)
Cedar Hill Fire Protection District Length of Service Awards Program	$64,619	$89,266	N/A% (Gross)	N/A% (Gross)	N/A% (Gross)
Clayton Non-uniformed Employee Pension Plan	$12,578,080	$13,502,222	18.64% (Gross)	10.94% (Gross)	12.76% (Gross)
Clayton Uniformed Employees Pension Plan	$34,571,575	$36,981,177	17.09% (Gross)	10.38% (Gross)	12.17% (Gross)
Columbia Firemens' Retirement Plan	$104,359,551	$109,816,799	14.15% (Net)	8.22% (Net)	8.37% (Net)
Columbia Police Retirement Plan	$104,359,551	$109,816,799	14.15% (Net)	8.22% (Net)	8.37% (Net)
Community FPD Retirement Plan	$20,554,583	$22,515,823	29.82% (Net)	12.46% (Net)	N/A% (Net)
County Employees Retirement Fund	$393,388,000	$415,660,000	20.0% (Gross)	10.9% (Gross)	14.1% (Gross)
Creve Coeur FPD Retirement Plan	$9,698,525	$9,998,240	n/a% (Gross)	n/a% (Gross)	n/a% (Gross)
Eureka FPD Retirement Plan	$8,658,410	$9,048,865	1% (Net)	1% (Net)	1% (Net)
Fenton FPD Retirement Plan	$23,571,844	$24,690,992	15.87% (Net)	8.29% (Net)	10.11% (Net)

Please be aware information provided in this report may contain unaudited data.

Plan Name	Beg. Market Value	End. Market Value	ROR 12 mos.	ROR 36 mos.	ROR 60 mos.
Firefighter's Retirement Plan of the City of St. Louis	$1,505,601	$2,337,667	0% (Gross)	0% (Gross)	0% (Gross)
Florissant Employees Pension Plan	$11,566,381	$12,080,315	9.13% (Net)	5.16% (Net)	5.16% (Net)
Glendale Pension Plan	$5,058,696	$5,255,576	16.51% (Gross)	10.00% (Gross)	12.72% (Gross)
Hannibal Police & Fire Retirement Plan	$12,954,019	$13,750,994	16.6% (Gross)	not available% (Gross)	68.4% (Gross)
Hazelwood City Council Retirement Plan	$31,397,431	$33,027,783	38.48% (Net)	15.18% (Net)	19.72% (Net)
High Ridge Fire Protection District Pension Plan	$6,618,615	$6,933,007	15.04% (Net)	8.66% (Net)	12.28% (Net)
Jackson County Employees Pension Plan	$216,890,479	$229,169,919	18.4% (Gross)	10.4% (Gross)	12.7% (Gross)
Joplin Police & Fire Pension Plan	$32,375,200	$33,972,522	10.43% (Net)	6.51% (Net)	11.30% (Net)
Kansas City Civilian Police Employees' Retirement System	$110,130,000	$114,778,000	12.5% (Gross)	7.5% (Gross)	10.9% (Gross)
Kansas City Police Retirement System	$725,505,000	$752,881,000	12.9% (Gross)	7.7% (Gross)	11.0% (Gross)
Kansas City Public School Retirement System	$699,854,583	$713,863,221	12.16% (Gross)	8.51% (Gross)	10.98% (Gross)
Kansas City Supplemental Retirement Plan	$1,552,397	$1,627,422	NA% (Net)	NA% (Net)	NA% (Net)
KC Area Transportation Authority Salaried Employees Pension Plan	$13,434,724	$15,541,495	18.51% (Gross)	9.54% (Gross)	12.34% (Gross)
KC Trans. Auth. Union Employees Pension Plan	$39,866,334	$41,775,903	15.99% (Net)	9.42% (Net)	13.87% (Net)
Ladue Non-uniformed Employees Retirement Plan	$4,028,118	$4,207,065	15.51% (Net)	8.43% (Net)	12.3% (Net)
Ladue Police & Fire Pension Plan	$26,559,665	$27,602,346	15.71% (Net)	8.51% (Net)	12.48% (Net)
LAGERS Staff Retirement Plan	$7,754,865	$8,253,456	19.41% (Net)	10.28% (Net)	11.86% (Net)
Little River Drainage Dist Retirement Plan	$1,181,279	$1,224,531	4.24% (Net)	4.59% (Net)	3.4% (Net)
Local Government Employees Retirement System	$5,554,077,658	$5,836,511,635	17.41% (Net)	11.48% (Net)	13.84% (Net)
Metro St. Louis Sewer Dist Employees Pension Plan	$234,273,240	$246,429,988	10.9% (Net)	8.0% (Net)	11.0% (Net)
Metro West FPD Retirement Plan	$36,735,248	$38,597,977	14.42% (Net)	6.69% (Net)	9.49% (Net)
Missouri Higher Education Loan Authority Pension Plan	$34,464,054	$34,417,403	n/a% (Net)	n/a% (Net)	n/a% (Net)
Missouri State Employees Retirement System	$8,315,440,909	$8,493,297,325	9.61% (Net)	8.30% (Net)	11.84% (Net)
MoDOT & Highway Patrol Employees' Retirement System	$1,728,165,957	$1,791,540,758	14.97% (Net)	10.58% (Net)	12.01% (Net)
North Kansas City Policemen's & Firemen's Retirement Fund	$44,258,805	$46,041,271	5.3% (Gross)	10.1% (Gross)	13.9% (Gross)
Olivette Salaried Employees' Retirement Plan	$17,916,842	$18,568,802	16.8% (Net)	10.5% (Net)	11.7% (Net)

Please be aware information provided in this report may contain unaudited data.

Plan Name	Beg. Market Value	End. Market Value	ROR 12 mos.	ROR 36 mos.	ROR 60 mos.
Pattonville-Bridgeton FPD Retirement Plan	$26,360,846	$27,904,194	30.82% (Net)	10.42% (Net)	17.60% (Net)
Prosecuting Attorneys' Retirement System	$33,242,544	$34,712,440	11.41% (Net)	6.89% (Net)	9.95% (Net)
Public Education Employees' Retirement System	$3,422,227,647	$3,611,229,076	16.7% (Net)	9.9% (Net)	11.7% (Net)
Public School Retirement System	$31,125,185,743	$32,627,535,116	17% (Net)	10.3% (Net)	11.9% (Net)
Raytown Policemen's Retirement Fund	$9,240,883	$10,436,510	16.27% (Gross)	8.15% (Gross)	0.00% (Gross)
Rock Community FPD Retirement Plan	$11,732,623	$12,270,213	19.10% (Net)	9.66% (Net)	12.66% (Net)
Sedalia Firemen's Retirement Fund	$6,774,273	$7,093,768	17.6% (Gross)	31.2% (Gross)	66.9% (Gross)
Sedalia Police Retirement Fund	$3,150,945	$3,113,580	7.34% (Gross)	5.62% (Gross)	0% (Gross)
Sheriff's Retirement System	$34,326,290	$36,648,201	19.67% (Gross)	11.575% (Gross)	13.158% (Gross)
Springfield Police & Fire Retirement Fund	$260,338,355	$281,979,775	14.78% (Net)	9.15% (Net)	11.71% (Net)
St. Louis County Employees Retirement Plan	$557,885,999	$580,603,316	18.65% (Gross)	10.36% (Gross)	14.40% (Gross)
St. Louis County Library Dist Empl Pension Plan	$38,572,451	$39,999,979	13.61% (Gross)	7.64% (Gross)	11.07% (Gross)
St. Louis Employees Retirement System	$729,578,560	$758,266,875	16.25% (Gross)	10.34% (Gross)	11.99% (Gross)
St. Louis Firemen's Retirement System	$470,661,725	$508,738,091	19.25% (Gross)	10.87% (Gross)	13.45% (Gross)
St. Louis Police Retirement System	$699,044,612	$715,059,553	15.73% (Gross)	8.39% (Gross)	12.70% (Gross)
St. Louis Public School Retirement System	$896,345,042	$951,245,405	15.8% (Net)	9.2% (Net)	12.6% (Net)
Valley Park FPD Retirement Plan	$4,430,628	$4,717,536	18.10% (Net)	9.89% (Net)	11.42% (Net)
	$57,249,355,318	$59,799,675,148			

TESTIMONY

April 10, 2014

Missouri Public Pensions:

Their Funding Status And Roadblocks To Reform

By Michael Rathbone

Testimony Before the Joint Committee on Public Employee Retirement

To the Honorable Members of the Committee:

Ladies and gentlemen, thank you for the opportunity to testify today. My name is Michael Rathbone and I am a policy researcher for the Show-Me Institute, a nonprofit, nonpartisan Missouri-based think tank that supports free-market solutions for state policy. The ideas presented here are my own. This testimony is intended to summarize research the Show-Me Institute has published that analyzes the financial state of Missouri public pensions and addresses some objections raised about shifting public pension plans to a more efficient structure.

The unfunded liabilities of the state's public pensions are an economic ticking time bomb. By using high discount rates, these pensions understate the amount of additional funding they need in order to be financially secure. In a policy study written for the Show-Me Institute, Andrew Biggs, of the American Enterprise Institute, showed that if these public employee pensions use a more appropriate discount rate, they would more accurately assess the true size of the state's obligations, which taxpayers must end up fulfilling.[1]

If pension liabilities continue to be understated, the state faces a significant risk and policymakers may be forced to make drastic cuts to services or significantly raise taxes in order to meet the state's pension obligations. The risk posed to Missouri's financial well-being is a real and serious one.

The state needs to better account for risk in order to start reforming public pensions. Taxpayers, state officials, and public employees all

Michael Rathbone is a policy researcher at the Show-Me Institute, which promotes market solutions for Missouri public policy.

Nothing about this project should involve public assistance. The project is proposed for a desirable location that is already part of an economically vibrant area

have expressed concern about the financial health of Missouri's public pension plans for state employees. The funding health of these plans has declined in recent years and current annual required contributions have increased for all of the state's largest pensions.

Most Missouri public employees participate in one of five retirement plans:

- Missouri State Employees Retirement System (MOSERS)
- Highway and Transportation Employees' and Highway Patrol Retirement System (MPERS)
- Missouri Local Government Employees Retirement System (MOLAGERS)
- Public School Retirement System of Missouri (PSRS)
- Public Education Employee Retirement System of Missouri (PEERS)

Combined, these plans report unfunded liabilities as of 2013 of $13.7 billion and a funding ratio of 77.4 percent.

However, this official amount vastly underestimates the true liability of these pensions. In Biggs' examination of these pension funds for plan year 2012, he found that the value of their unfunded liabilities was **five** times their officially reported amount.[2]

According to Biggs, these public pensions are allowed to use a discount rate to calculate the present value of their plans' liabilities that is different from one that economic scholars such as Biggs and private sector plans use.[3]

A discount rate basically is compound interest in reverse. If, for instance, I owe someone $10,000 five years from now, the discount rate tells me how much I would need to invest to ensure I can make that payment. The higher the rate of return, the lower amount I need to invest. Assuming I could get a robust 12 percent annual return on my money, I need to invest only $3,200 to repay my loan. However, if I believe I would only get an annual 4 percent return on my money, I need to invest $6,800.

The Missouri plans use discount rates between 7.25 and 8 percent. Most economists would use a lower rate, which better accounts for the risks inherent in a portfolio with risky assets and guaranteed liabilities.

Despite these five public pensions expecting returns between 7.25 and 8 percent on their portfolios, their actual returns can be much higher or much lower than expected. This volatility brings with it an added risk: a major down year can have an adverse impact on the portfolio's assets. If, for instance, the state pensions had a 10 percent loss one year and a 10 percent gain the next year, they would still have suffered a net loss.

There is nearly universal support among economists for using low discount rates to value public pension liabilities. In October 2012, the University of Chicago's Booth School

of Business surveyed a group of elite economists from varying fields of expertise and ideological outlooks. Ninety-eight percent of them agreed that public pension discount rates are too high. Biggs cited other research, from the Congressional Budget Office, the Federal Reserve, academic economists, and others, that all point to the same conclusion: the high discount rates that Missouri pensions use substantially underestimate the true value of these plans' liabilities and overstate their funding health.

Currently, the state's largest public plans are defined benefit (DB) plans. The state promises to pay its retirees a pre-determined monthly amount based on a variety of factors, including final salary, age, and tenure. To contain the growth of public pension liabilities, the state should align benefits to contributions. Transitioning current plans to better designed alternatives (*e.g.*, defined contribution, hybrid defined contribution/defined benefit, cash balance, etc.) can accomplish this.[4]

Shifting away from DB plans as structured has been met with fierce opposition in the past.[5] One of the points raised against shifting toward a more efficient system is that by shifting to a new system, other costs to the state would be imposed before any savings will be seen.[6]

These "transition costs" come in two types. First, plans perceive that the Government Accounting Standards Board (GASB) will require an accelerated repayment of unfunded liabilities if the current plan is closed. Second, there is a perceived need for a closed plan to shift its holdings to less risky, more liquid assets as the plan's members age. These assets are expected to generate a smaller return and thus require higher contributions.[7]

Biggs addressed these concerns in his new policy study for the Show-Me Institute, "Missouri Transition Costs and Public Pension Reform." In response to the first type of perceived transition cost, Biggs found that, "GASB accounting standards are guidelines for disclosure; these guidelines are not intended to dictate funding policy. Recent reforms to GASB guidelines make clear that they are intended to measure pension liabilities, not determine how pension liabilities should be funded." Biggs also stated that there would be no economic or policy reason to increase the rate of repayment of unfunded liabilities.[8]

As to the second type of perceived transition cost, Biggs wrote, "Increasing the liquidity of plan investments would have only small effects on expected returns. A closed plan's investments must be truly liquid only in the final years before true shutdown, which would be decades in the future." Also, if pension plans were valued using lower discount rates, as Biggs recommends, closing a plan would have only a small effect on a plan's liabilities.[9]

In order to protect taxpayers from significantly increased future burdens, the state should take preemptive steps to ensure pensions can meet their obligations. These steps include (1) using a more realistic discount rate to accurately gauge the state's true pension obligations

There is nearly universal support among economists for using low discount rates to value public pension liabilities.

and (2) shifting away from currently structured defined benefit plans toward more effectively structured plans. These steps will help ensure that the state has a better picture of its pensions' financial conditions and prevent the accrual of additional liabilities.

Fears about so-called transition costs should not stand in the way of enacting real pension reform. In summarizing his conclusions regarding transition costs, Biggs wrote, "…claims of transition costs are, at some times, overstated and, at other times, entirely mistaken."[10] Thus, the transition cost issue is not one that should prove an obstacle toward major reform.

The state needs to better account for risk in order to start reforming public pensions.

NOTES:

[1] Biggs, Andrew. "Public Employee Pensions in Missouri: A Looming Crisis." Show-Me Institute Policy Study. March 11, 2013. View online here: http://show-meinstitute.org/publications/policy-study/taxes/922-ps36-biggs-public-pensions.html.

[2] Ibid.

[3] Private sector defined benefit plans are required to value their liabilities using the yield on a portfolio of high-quality corporate bonds. As of February 2012, the yield in the Citibank Liability Index is 4.6 percent.

[4] Portions of this testimony were taken from: Shuls, James V., and Michael Rathbone. "Missouri Transition Costs and Public Pension Reform." Show-Me Institute Policy Briefing. February 2014. View online here: http://www.showmeinstitute.org/publications/policy-study/taxes/1109-missouri-transition-costs-and-public-pension-reform.html.

[5] Ganey, Terry. "Speakers oppose state pension shift." *Columbia Daily Tribune*. Feb. 18, 2010. View online here: http://www.columbiatribune.com/news/politics/speakers-oppose-state-pension-shift/article_058330a5-0cf7-5a62-a219-8d420e-ca4583.html.

[6] The executive director of MOSERS raised this transition cost issue in his comments regarding one of Biggs' publications. Read the complete back and forth online here: http://pensiondialog.wordpress.com/2012/05/24/pension-transition-cost-myths/.

[7] Biggs, Andrew. "Missouri Transition Costs and Public Pension Reform." Show-Me Institute Policy Study. Feb. 17, 2014. View online here: http://showmeinstitute.org/publications/policy-study/taxes/1093-missouri-transition-costs-and-public-pension-reform.html.

[8] Ibid.

[9] Ibid.

[10] Ibid.

Fears about so-called transition costs should not stand in the way of enacting real pension reform.

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POLICY STUDY

NUMBER 36 MARCH 2013

Public Employee Pensions in Missouri:

A Looming Crisis

By Andrew G. Biggs

BOARD OF DIRECTORS

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Public Employee Pensions in Missouri: A Looming Crisis

By Andrew G. Biggs

Resident Scholar
American Enterprise Institute

INTRODUCTION

In Missouri and around the country, elected officials, taxpayers, and financial markets have expressed concerns about the financial health of defined benefit pension plans for state and local government workers. Public employees also are concerned, as many rely heavily upon these plans for income in retirement.

These pension plans have come under increased scrutiny as funding levels have dropped and required contributions have risen. According to standard actuarial accounting, the average public pension funding fell to about 75 percent in 2011, versus 103 percent in 2000.[1] The Annual Required Contributions that state and local governments make to public pensions have more than doubled in nominal terms since 2001, a period in which prices rose by only about 25 percent.[2] Public sector pensions, as of mid-2011, were underfunded by approximately $885 billion, based on accounting rules that the Governmental Accounting Standards Board established and applied to a large sample of plans from the Public Plans Database.[3]

A similar pattern holds for the Missouri public employee pensions, which serve state and local government employees. Annual required contributions have risen and measured funding health has declined. Most Missouri public employees participate in one of five retirement plans:

- Missouri State Employees Retirement System (MOSERS)
- Highway and Transportation Employees' and Highway Patrol Retirement System (MPERS)
- Missouri Local Government Employees Retirement System (MOLAGERS)

According to standard actuarial accounting, the average public pension funding fell to about 75 percent in 2011, versus 103 percent in 2000.

- Public School Retirement System of Missouri (PSRS)
- Public Education Employee Retirement System of Missouri (PEERS)

Together, they report unfunded liabilities as of 2012 of $11.1 billion and a combined funding ratio of 81 percent.

However, reports from academic economists and nonpartisan government agencies imply that the true state of public sector pension funding is far worse than suggested in official plan disclosures.[4] The accounting rules U.S. public sector pensions follow are more forgiving than those required for private sector pensions or public sector plans in other countries. So-called "fair market valuation" more fully reveals the value of public sector plan liabilities and shows that public employee plans are far less well-funded than commonly understood. In Missouri, the market valuation approach shows combined public employee plans to be only 46 percent funded, with unfunded liabilities approaching $54 billion.

While state and local governments around the country have enacted reforms to public sector pension plans — including contribution increases, less generous benefits for newly hired employees, and in some cases, reductions in cost of living adjustments (COLAs) for current beneficiaries — accurate accounting of public employee pension liabilities shows that elected officials must do much more to make these plans financially sustainable. Even if policymakers change the terms upon which future benefits are earned — a step which is both politically and legally problematic — the fact that existing pension liabilities are all but guaranteed implies that their true value is significantly higher than reported in public pension financial statements.

This paper describes how public employee pensions currently measure their financial health; discusses the consensus among economists that current accounting rules significantly understate pension liabilities and overstate pension funding levels; and describes how pension financing would appear using accounting rules similar to those required for private sector pensions or for public employee plans in other countries. Following that is discussion of objections to fair market valuation. Finally, we discuss the costs and benefits of potential reforms, including shifting to defined contribution or cash balance pension structures.

BACKGROUND ON PUBLIC EMPLOYEE PENSION PLANS

Most state and local governments provide a defined benefit pension plan for public employees as part of their overall compensation. These plans generally provide for retirement, disability, and survivors' benefits, and may either supplement or substitute for Social Security benefits. Defined benefit (DB) plans base retirement benefits upon a formula deriving from the employee's earnings and years of service; the plan sponsor bears any investment risk. DB pensions differ from the "defined contribution" (DC) 401(k)-type plans predominant in the private sector. In a DC plan, the employee is not guaranteed a fixed benefit at retirement. Rather, the employer contributes to the employee's

retirement account and the employee accepts any market risk associated with his investments.

Missouri's state and local pensions operate similarly to defined benefit pensions in the private sector. Once vested — usually after five years in Missouri — an employee becomes entitled to a benefit based upon a percentage of final salary. For MOSERS, for instance, "final salary" actually equals the average of the highest 36 consecutive months of compensation. This percentage of final salary is multiplied by the employees' number of years of service. Public pensions typically pay benefits equal to about 2 percent of final earnings per year of employment, although these replacement factors can differ from place to place, in particular, based upon whether the employee also participates in Social Security. In Missouri, teachers do not pay into Social Security so their replacement factor is higher, at 2.5 percent. Other Missouri plans in which workers do participate in Social Security receive a lower replacement of final salary, generally 1.6 percent to 1.7 percent.[5]

One important difference between public sector and private sector defined benefit pensions is that adjustment for inflation is virtually absent in private plans but common in public sector programs. Provisions for inflation adjustment vary significantly from plan to plan. In some cases, such as Missouri, adjustments to changes in the Consumer Price Index (CPI) are automatic. MOSERS, for instance, pays an annual COLA equal to 80 percent of the change in the CPI; the COLA is capped at 5 percent, and it cannot be negative even if prices fall. In some other states, post-retirement benefit increases are based on different formulas, and in others, they are discretionary or based on plan funding health.

Public sector pensions generally allow earlier retirement than in the private sector, in particular for public safety officers. Reductions in benefits for early retirement are usually smaller than actuarially fair, meaning that early retirees tend to receive higher total lifetime benefits over the course of their retirements.[6] As a result, public sector employees tend to retire at a younger age than private sector workers. In 2012, the average age of new retirees in MOSERS was 59.9 years, which is fairly typical of public plans across the country.[7] The typical age for first claiming Social Security benefits, by contrast, is closer to 63.

Public sector pensions are financed through a combination of employee and employer contributions and investment earnings. Nationwide, the average employee contribution rate as of 2009 was 6.4 percent of wages, according to the Public Plans Database, although contributions vary significantly from place to place. In Missouri, most non-education employees contribute relatively little toward their pensions. For instance, for many local employees, MOLAGERS is entirely non-contributory, while others pay about 4 percent of wages into the program. Newer MPERS employees hired since 2010 must contribute 4 percent of their pay, although MOSERS's actuarial report notes that rebates lowered the net employee contribution rate to 2.76 percent of pay.[8] Older MPERS employees do not contribute. Missouri teachers, by contrast, contribute

Reports from academic economists and nonpartisan government agencies imply that the true state of public sector pension funding is far worse than suggested in official plan disclosures.

14.5 percent of their pay toward pensions. In addition, state employees contribute 6.2 percent of pay to Social Security alongside a similar match from their employers.

Employer and employee contributions are invested in a range of assets, which are used as needed to fund benefits. The MOSERS portfolio consists of 45 percent stocks (equities), 30 percent fixed income investments, and 25 percent "alternative investment." This latter class consists of private equity, commodities, real estate, and other types of investments that generally produce higher returns than equities, though with greater risk.[9]

HOW PENSIONS VALUE THEIR LIABILITIES

Pensions compare their assets to their liabilities to calculate their financial health; that is, the investments they hold today relative to the benefits they must pay in the future. Using these figures, they calculate the funding ratio — that is, assets divided by liabilities — and the plan's unfunded liability, which is the net of assets and liabilities.

The key question for pension valuation is how to assign a value today to benefit liabilities that will be paid years or decades in the future. Because investments can earn interest, it is not necessary to contribute a full dollar today to fund each dollar of future liabilities. Without such a so-called "present value" it is impossible to accurately compare a pension's liabilities to the assets the plan holds today and thereby determine how well-funded it is.

In Missouri, the market valuation approach shows combined public employee plans to be only 46 percent funded, with unfunded liabilities approaching $54 billion.

The present value of a plan's liabilities is calculated using a method known as discounting, which is equivalent to compound interest in reverse. While compound interest involves taking a current dollar amount and adding interest each year, discounting begins with the future dollar amount and subtracts interest each year until a present value is determined.

The present value of a future dollar amount depends crucially upon the interest rate at which the liability is discounted. For instance, consider a debt of $1 to be paid 20 years from now. Assuming an 8 percent discount rate produces a present value of only 21 cents. At a 4 percent discount rate, however, the present value more than doubles to 46 cents.

Under current pension accounting rules, which the Governmental Accounting Standards Board establishes, a public pension plan discounts its liabilities using the rate of return the plan assumes will be generated by the portfolio of assets it holds. The average expected return on assets used in such valuations is close to 8 percent, with a range from 6 percent to 8.5 percent. Until recently, MOSERS assumed an 8.5 percent annual return, but today assumes a value of 8 percent. Missouri teachers and public school employees also assume 8 percent returns, while the Missouri Local employees' plan utilizes a 7.25 percent discount rate.

The discounted value of plan liabilities is then compared to the value of assets to calculate the plan's funding ratio (assets divided by liabilities) and its unfunded liability (assets minus liabilities). Table 1 uses figures from

the MOSERS 2012 actuarial valuation. The plan's liabilities, calculated using an 8 percent discount rate, equal approximately $10.8 billion. Its assets, by contrast, are worth only about $7.9 billion. This leaves an unfunded liability of nearly $2.9 billion and a funding ratio of slightly more than 73 percent.

Discount rates are also used to calculate the plan's Annual Required Contribution (ARC). The ARC consists of two separate costs: the "normal cost," which represents the cost of benefits accruing in a given year, and the cost of amortizing (or paying off) unfunded liabilities from prior years. Again, assuming an 8 percent discount rate, MOSERS has a total normal cost of 8.04 percent of employee payroll, 0.66 percentage points of which is offset by employee contributions. In addition, the cost of amortizing unfunded liabilities equals 9.60 percent of payroll, for a total employer contribution rate, or ARC, of 16.98 percent of pay.

Employer contributions to MOSERS have risen significantly over the past decade, from 9.35 percent of payroll in 2002 to 12.84 percent of payroll in 2006 to nearly 14 percent in 2011-12. While the contribution rate is calculated to be constant over time, it is likely contribution rates will increase to almost 17 percent in the 2013-14 fiscal year. The reason is that most plans, including Missouri's, calculate their funding ratios and the contributions necessary to reach full funding using a measure known as "actuarial assets." This measure "smooths" investment returns from year to year to produce a less volatile measure of plan financing. For instance, currently, the actuarial value of MOSERS assets exceeds the market value of those assets by about 4 percent, according to the plan's actuarial valuation. Over the next several years, the actuarial value of assets should be brought into line with the market value; this process should increase required contribution rates somewhat.

Even if policymakers change the terms upon which future benefits are earned — a step which is both politically and legally problematic — the fact that existing pension liabilities are all but guaranteed implies that their true value is significantly higher than reported in public pension financial statements.

TABLE 1

SUMMARY FINANCING INFORMATION FOR MOSERS AS OF JUNE 2012

Total Actuarial Accrued Liability	**$10,793,651,577**
Actuarial Value Of Assets	**$7,897,167,203**
Unfunded Actuarial Accrued Liability	**$2,896,484,374**
Funded Ratio	**73.20%**

Source: 2012 Actuarial Valuation

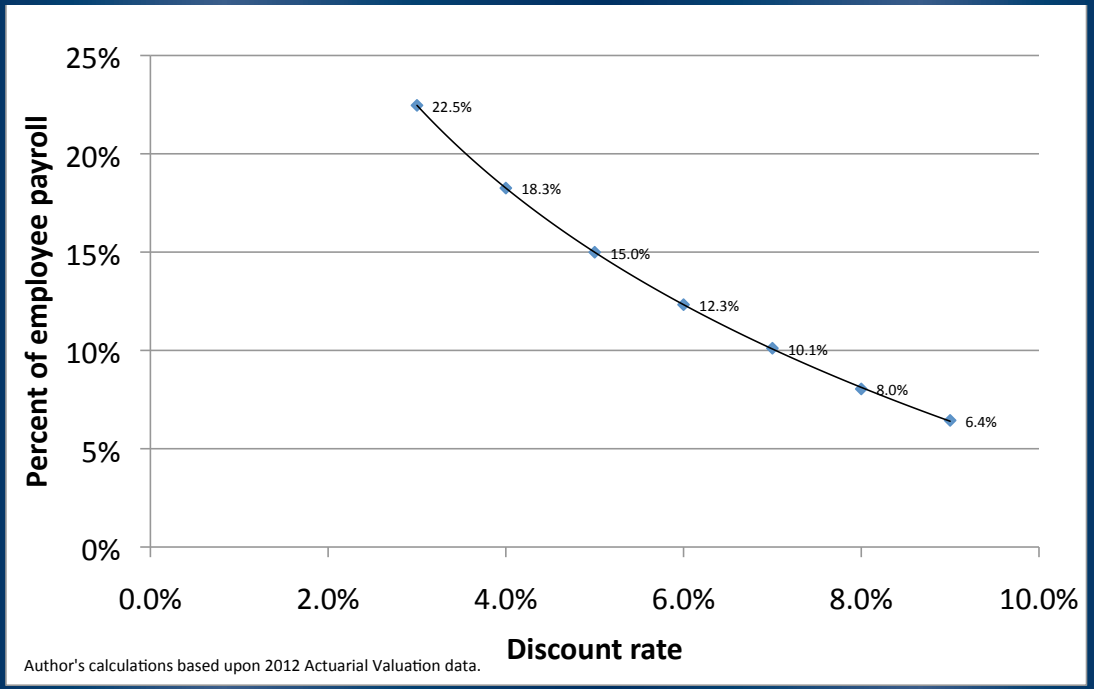
Most state and local governments provide a defined benefit pension plan for public employees as part of their overall compensation. These plans generally provide for retirement, disability, and survivors' benefits, and may either supplement or substitute for Social Security benefits.

As noted previously, the reported funding health of a plan is extremely sensitive to the discount rate chosen. Figure 1 shows estimates of the variation in normal costs along with the discount rate, based upon a limited sensitivity analysis contained in the MOSERS 2012 actuarial valuation. As Figure 1 shows, the total normal cost of the plan rises rapidly as the discount rate falls. At the assumed return of 8 percent, the normal cost equals 8.04 percent of employee pay, all but 0.66 percentages of which the employer bears. At a 6 percent rate, the normal cost rises to 12.3 percent of pay; at a 4 percent rate, it reaches 18.3 percent of wages.[10]

Amortization costs also would increase, though by a slightly smaller rate than the employer's normal costs. This difference occurs for two reasons. First, because the employee contribution toward normal costs is generally fixed, the employer is responsible for all increases in the total normal cost, not merely the proportionate share that it ordinarily pays. Second, the effect of the discount rate depends upon the duration of the plan's liabilities. New benefits earned this year have a longer average duration than unfunded benefits that already have been earned, so the effects of changes in the discount rate are slightly smaller.

The MOSERS and other Missouri pension reports do not provide data to easily estimate the effect of a changing discount rate on amortization costs. For that reason, I turn to an analysis of the Florida Retirement System (FRS), which its actuaries conducted on behalf of the program. In that analysis, the FRS actuaries calculated normal costs and amortization costs for the various FRS plans using a wide range of discount rates.[11] On average, normal costs in the FRS increased by about 30 percent

FIGURE 1: Total Normal Cost of MOSERS at Different Discount Rates



Author's calculations based upon 2012 Actuarial Valuation data.

for each percentage point the discount rate was reduced. This pattern is similar across the FRS plans, as well as similar to calculations that actuaries conducted for plans in the states of Washington, California, and Colorado. While the applicability of the Florida simulations to MOSERS depends upon the specifics of the plans, the average age of active employees is almost identical in both plans. Other factors may differ, however. With those caveats in mind, lowering the discount rate from 8 percent to 4 percent would raise annual amortization costs from 9.6 percent of total employee wages to approximately 68 percent of pay. Under GASB's newly issued Rules 67 and 68, beginning in 2013, pensions will be required to publish actuarial figures using discount rates 1 percentage point above and 1 percentage point below the plan's chosen rate. Thus, Missouri plans soon may be publishing similar calculations themselves. The variation in the plan's costs as the discount rate changes illustrates the degree to which a plan's funding health depends upon the higher returns generated by risky investments.

Combining the effects on normal costs and amortization costs, a lower discount rate or investment return could easily make Missouri pension plans appear unaffordable to the taxpayer. Thus, the importance of a seemingly arcane debate about the proper pension discount rate should not be underestimated.

THE FAIR MARKET VALUATION CRITIQUE

At first glance, the current approach to measuring pension liabilities that GASB established makes perfect sense: if you expect plan assets to appreciate 8 percent per year, then discounting the plan's liabilities at 8 percent will tell you the exact assets the plan would need to hold today in order to meet its liabilities in the future. If the plan is underfunded, it will tell you the extra contributions you must make in order to bring the plan back to full funding. In this way, the current GASB rules may appear to be more "realistic" than alternative approaches.

For this reason, many — including many pension actuaries and plan managers — are puzzled that financial economists believe the discount rate applied to a benefit liability should have *nothing* to do with how the plan's assets are invested. Pension insiders often are surprised to hear that this is how the vast majority of economists view the valuation argument, and it is also how private financial markets assign values to liabilities. This section discusses why that is the case.

To economists, the discount rate you apply to a liability should be based on the risk of the liability itself, *not* of any assets used to fund the liability.[12] If public pension benefits are guaranteed — as they are intended to be, and as legal rulings and state constitutions have determined them to be — then they should be discounted using the interest rates that the markets pay on guaranteed investments, such as U.S. Treasury securities.[13] Even if the Missouri government were capable of changing the terms on which future benefits are accrued — a step which is politically difficult and in many cases legally problematic — benefits that already have been earned are effectively guaranteed under contract provisions of the Missouri Constitution. These accrued benefits constitute the liabilities that pension valuations seek to quantify.

Defined benefit (DB) plans base retirement benefits upon a formula deriving from the employee's earnings and years of service; the plan sponsor bears any investment risk.

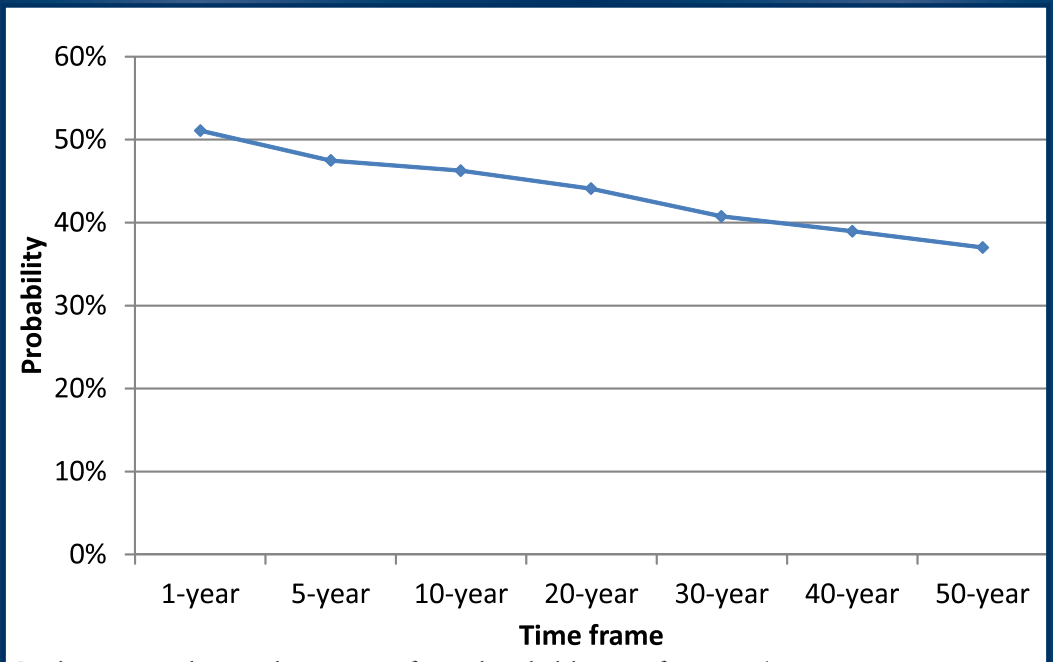
In a DC (defined contribution) plan, the employee is not guaranteed a fixed benefit at retirement. Rather, the employer contributes to the employee's retirement account and the employee accepts any market risk associated with his investments.

While stocks, bonds, and alternative investments have high expected returns, they also can be very risky. In fact, their high expected returns are nothing other than compensation for the fact that, while these returns may be *expected*, they are not guaranteed. An analysis of MOSERS investments easily demonstrates this fact.

MOSERS assumes an 8 percent annual return on its investment portfolio. While there are reasons to believe this assumption may be over-optimistic, for these purposes we will take it as a given.[14] This portfolio, according to a 2009 analysis for MOSERS by the Summit Strategy Group, has an expected standard deviation of annual returns of 10.4 percent. The standard deviation is a measure of risk of how far year-to-year returns tend to vary from the long-term average return. Using these assumptions, it is possible to simulate how MOSERS investments will fare over certain periods of time.

For instance, what is the probability that MOSERS will achieve its projected 8 percent return over the next 10 years? 20 years? 50 years? The results illustrated in Figure 2 show that the plan has an almost 50-50 chance of earning 8 percent returns over a single year — that result is essentially by definition — but over longer time periods, the chance of meeting or exceeding 8 percent average returns falls well below 50 percent. Over 20 years, the probability is only 44 percent and over 50 years, it is 37 percent. These results should not be in dispute, because they closely mimic those of the 2009 Summit report. They occur because the 8 percent return that Missouri pensions assume is an "arithmetic mean," which denotes a simple average of a number of annual

FIGURE 2: Probability of MOSERS Portfolio Achieving 8% Return Over Varying Time Periods



Based on 5,000 simulations with mean return of 8% and standard deviation of returns 10.4%.

returns. An 8 percent discount rate applied to pension liabilities, by contrast, is a "geometric mean" or "compound return" that abstracts from the volatility of year-to-year returns. So long as annual returns are volatile, the arithmetic mean will be below the geometric mean. This demonstrates the degree to which public pension accounting ignores risk. Under GASB rules, a Missouri public pension could call itself "fully funded" even if it had a less than 50 percent probability of being able to meet its current obligations with the assets it has on hand.

Yet, while MOSERS has a less than 50 percent probability of meeting its projected investment returns, it nevertheless has a 100 percent legal *obligation* to pay the benefits that those returns finance. Missouri courts have ruled that vested pension benefits are protected by constitutional protections for contracts.[15] As the Summit investment report notes, "Because the benefit is a legal obligation of the state, any shortfall must be paid for by higher future investment returns [and/or] higher contributions."

The mismatch between the high risk of the pension portfolio and the low risk of the pension's benefits creates a *contingent liability* to pay full benefits even if the pension's investments do not produce the expected returns. This obligation represents an additional cost to the taxpayer over and above the cost of current contributions. The fair market valuation approach is designed to capture the value of benefits not simply expected to be paid, but *guaranteed* to be paid. Current pension accounting standards ignore the value of this contingent liability.

The way to calculate the full value of public pension liabilities is through a risk-adjusted discount rate; that is, an interest rate derived from investments that have approximately the same risk as the liability to which the discount rate is being applied.

UNDERSTANDING MARKET RISK AND CONTINGENT LIABILITIES

Economists agree that a risk-adjusted discount rate is the best way to capture the true value of public pension liabilities. But why? The following section illustrates one way of understanding this issue.

Consider a pension that owes a guaranteed lump sum payment of $1 million in 15 years' time. Under GASB accounting rules, if the plan invests $301,194 today — the current value of $1 million discounted at an 8 percent interest rate[16] — it can call itself fully funded. This investment path is illustrated using the blue line in Figure 3.

But according to market valuation, if this payment is indeed riskless, it should be discounted at a riskless interest rate. If the riskless return is 4 percent, the true value of the liability is $548,812, almost twice as much up front as is required under the actuarial approach. This is represented as the red line in Figure 3. This illustration should demonstrate why most pension interests — governments, public employees, plan managers, and so on — prefer the actuarial approach.

If the pension's assets have an expected return of 8 percent, then investing $301,194 today will deliver an *expected* payoff of $1 million in 15 years.

Changing plan structures, to either a defined contribution or cash balance approach, will not eliminate existing unfunded liabilities.

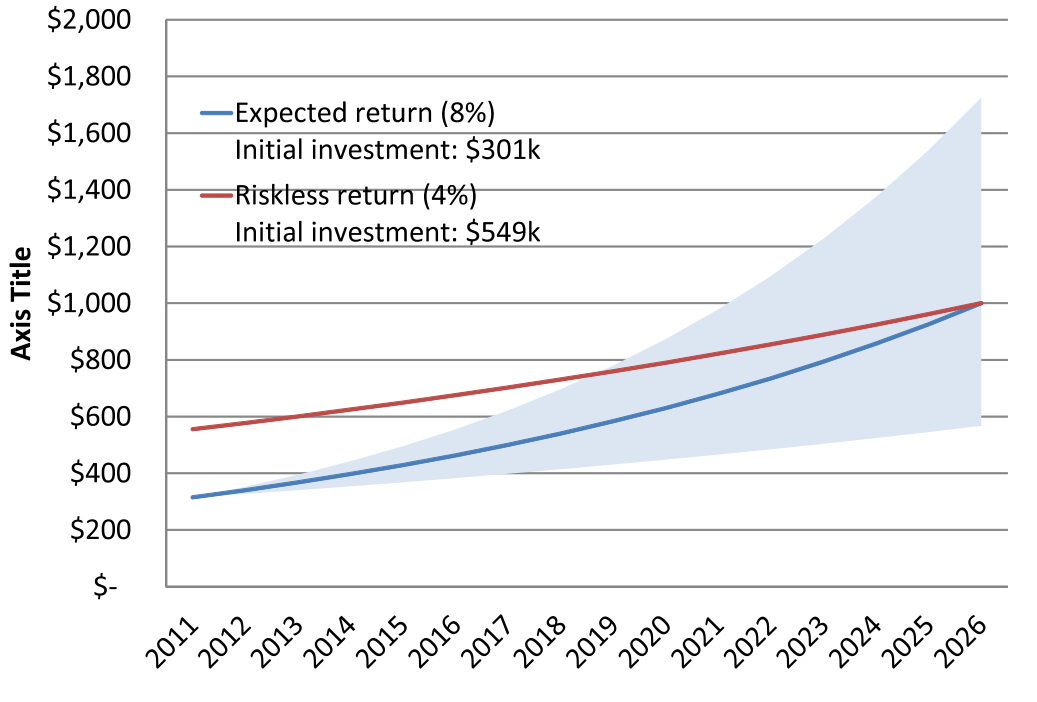
One important difference between public sector and private sector defined benefit pensions is that adjustment for inflation is virtually absent in private plans but common in public sector programs.

The problem is that assets with an expected return of 8 percent cannot produce such a return with certainty, meaning that the portfolio's value after 15 years will almost certainly end up being higher or lower than the desired $1 million. In other words, rather than a single blue line in Figure 3 representing investment in risky assets, a better representation is through an area (shown in light blue) illustrating a range of possible outcomes — approximately half of which exceed the $1 million goal, with the remaining half falling short.[17] No matter how well a pension plan manages its investments, it cannot generate 8 percent returns with certainty. The actual return the plan receives is based on the luck of the draw. Given that the benefits must be paid 100 percent of the time, a plan that has, at best, a 50 percent chance of being able to meet its obligations is not "fully funded" in the way that most laymen or policymakers would interpret the term.

In reality, a plan seeks neither to overshoot nor undershoot. If the plan's investments exceed their projected return, that means the initial contribution could have been smaller. Alternately, if the investments come up short of their goal, the plan will not be able to pay what it owes and must turn to the taxpayer for additional funds.

However, there are financial products — called "options" — that provide a solution. A "call option" allows the pension plan to sell off any surplus if the plan's investment turns out to be worth more than $1 million. A plan that sells a call option can use the proceeds to offset the cost of the initial

FIGURE 3: Illustrating Fair Market Valuation of Liabilities



investment, thereby eliminating the costs of overshooting the pension's goal.

Likewise, a "put option" can be purchased to top up the difference between the assets' actual value and $1 million if the investment comes up short. The put option protects against outcomes in which the plan's investments fall short. So, barring some catastrophic collapse of financial markets, the plan will *always* be able to pay *exactly* the promised $1 million, with no wasted money, if it invests $301,194 in safe assets and sells a call option to dispose of any surplus *and* purchases a put option to cover any shortfall.

This means that the cost of truly fully funding the $1 million future liability — meaning, funding it so that it is guaranteed to be paid without recourse to a taxpayer bailout and without any wasted surplus — is the $301,194 initial investment *minus* the $11,436 proceeds from selling the call option, *plus* the $259,053 cost of purchasing the put option. The net cost is $548,812, precisely the same as if the liability had been discounted and funded using the 4 percent riskless rate of return.[18]

The net cost of the put and call options represents the value of the contingent liabilities that have been placed upon future taxpayers based upon funding decisions made today. This cost is *not* a worst-case scenario, as some believe. Rather, it represents the price that future taxpayers would willingly pay to rid themselves of the *risk* of being called on to made good on promises that were made, and should have been paid for, by today's taxpayers.

This example also helps explain a number of points that are raised in the debate about pension valuation. First, the total cost of the liability will always be the same regardless of how the plan chooses to invest. A more conservative pension might invest larger amounts in more conservative assets, increasing costs for current taxpayers but leaving smaller contingent liabilities on future generations. Alternately, a more aggressive plan might make smaller upfront contributions but invest them in riskier assets. This reduces costs today, but generates a matching increase in the value of the contingent liability on future taxpayers. It is not a result unique to the plan investing in a portfolio with an 8 percent expected return. Investing in portfolios with greater or lesser risk will change the values of the initial contribution and of the put and call options, but the total liability cost will not change. Importantly, the total liability will have the same value regardless of how the pension plan chooses to invest.[19]

Second, this example illustrates that fair market valuation is not an academic exercise with no relevance to the actual investments public pensions make. The cost of the put and call options is determined in the market and is based upon the riskless return available in the market and upon the risk of the investments the plan holds. In other words, it makes sense to discount riskless pension liabilities using a riskless interest rate.

In Missouri, most non-education employees contribute relatively little toward their pensions.

HOW DOES MISSOURI PENSION FINANCING LOOK UNDER FAIR MARKET VALUATION?

The first step to determining an accurate estimate of public pension liabilities is to choose the appropriate discount rate. We know from the previous discussion that discounting guaranteed benefit liabilities using an interest rate derived from risky portfolio investments is incorrect. We also know that the discount rate used to value government guaranteed benefits should be derived from an investment whose risk matches that of the pension liabilities being valued. Thus, while there is little disagreement among economists regarding how to choose an appropriate discount rate, there is some controversy among economists regarding a specific interest rate to use.

Perhaps the simplest approach is to use bond yields from the government sponsoring the pension plan. After all, both pension benefits and bond payments represent future payments of cash, which the same government guarantees. Currently, Missouri municipal bonds with a duration of 15 years — about the average for public pension liabilities — have a yield of about 2.8 percent.[28] If you consider Missouri pension benefits to have

WHAT DO EXPERTS SAY ABOUT GASB PENSION ACCOUNTING RULES?

The preceding sections summarize the economic argument against the current GASB pension accounting rules and how they disguise the value of public employee compensation. It is worth noting that the vast majority of academic economists and nonpartisan government agencies take the same position regarding how to value public pension liabilities.

Donald Kohn, then-vice chairman of the Federal Reserve Board, declared in 2008:

> While economists are famous for disagreeing with each other on virtually every other conceivable issue, when it comes to this one there is no professional disagreement: The only appropriate way to calculate the present value of a very-low-risk liability is to use a very-low-risk discount rate.[20]

Similarly, the Fed's director of research and statistics, David W. Wilcox, testified in 2008 that:

> These [public pension benefits] happen to be really simple cash flows to value. They're free of credit risk. There's only one conceptually right answer to how you discount those cash flows. You use discount rates that are free of credit risk. This is one of those things where it just really is that simple.[21]

In a 2009 research paper, two economists from the federal Bureau of Economic Analysis (BEA) noted:

> If the assets of a defined-benefit plan are insufficient to pay promised benefits, the plan sponsor must cover the shortfall. This obligation represents an additional source of pension wealth for participants in an underfunded plan.[22]

Based on this logic, the BEA recently stated that, "Contributions aren't always a good approximation for the value of benefits accrued through service."[23]

Beginning in 2013, the national income and product accounts, which are the official "books" of the United States economy, will measure public pension liabilities using a market-based tool that captures the value of benefit guarantees to employees. This means that liabilities that the pension plans report will now be inconsistent with those same liabilities as reported in the official ledger books of the United States.

In 2011, the Congressional Budget Office issued a report that was widely taken as a confirmation of the market valuation approach:

> By using the expected return on a pension plan's assets to discount future payments to beneficiaries, the guidelines issued by the Government Accounting Standards Board (GASB) implicitly reflect an assumption that the risk to workers that states and localities will fail to pay future retirement benefits is the same as

about the same risk as explicit debt that Missouri governments issue, this is the appropriate discount rate to use.[29]

It is worth noting, however, that the discount rate appropriate to value pension benefits is time-specific: that is, if bond rates rise or fall in the future, then the appropriate discount rate — and the value of liabilities and the cost of funding accruing benefits — will shift up or down as well, and by a significant margin. This is sometimes portrayed as a failing of market valuation. This objection is incorrect for several reasons. First, any year-to-year fluctuation in liabilities based on changing interest rates is real: if you wish to guarantee payment of some given dollar amount in the future, it actually is cheaper to do it when interest rates are high instead of when they are low — just as it actually *is* cheaper to purchase a house when mortgage interest rates are low. Pretending otherwise does not make sense. Alternately, to put it in the context of a pension's current investment policy of attempting to target an 8 percent annual return, it is easier to do so — meaning, it can be done with less risk — when interest rates on low-risk assets are high rather than when they are low.

> the risk that expected returns on the plan's assets will not be realized. In fact, because the risk to future payments to beneficiaries is generally much less than the risk to the returns on typical assets held by pension plans, standard financial principles of valuation suggest that future benefit payments be discounted at a lower rate than under GASB's guidelines… By accounting for the different risks associated with investment returns and benefit payments, the fair-value approach provides a more complete and transparent measure of the costs of pension obligations…[24]

In October 2012, the IGM Forum at the University of Chicago's Booth School of Business surveyed 39 professional economists with regard to public pension discount rates. This group of highly respected economists represents differing areas of expertise and a wide variety of outlooks on the role of government. They were asked to express their agreement or disagreement with the following statement:

> By discounting pension liabilities at high interest rates under government accounting standards, many U.S. state and local governments understate their pension liabilities and the costs of providing pensions to public-sector workers.

Ninety-eight percent of the economists surveyed agreed with this proposition, with 49 percent agreeing strongly. None of the economists surveyed disagreed (a small percentage were unsure).[25]

Also in 2012, the Moody's Investor Services announced that its ratings of state and local government debt would no longer incorporate pension liabilities as measured under GASB rules. Instead, Moody's would discount pension liabilities using a corporate bond yield, similar to the way in which private pension liabilities are measured.

Indeed, in response to criticism of its standards methods, GASB recently announced revisions to its rules that would lower the discount rate applied to public pension liabilities, albeit not nearly so far as most independent analysts would advocate. Under these new rules, pensions could apply the expected rate of return on assets only to liabilities that could be expected to be funded by those assets. Liabilities taking place in years after which assets are expected to be depleted would be discounted using a municipal bond rate.

GASB's proposed revisions have both theoretical and practical flaws.[26] The State Budget Crisis Taskforce, co-chaired by former New York State Lieutenant Governor Richard Ravitch and former Federal Reserve Board Chairman Paul Volker, stated that even GASB's proposed rules would "fall far short of what finance experts argue is appropriate and reported unfunded liabilities will not increase anywhere near as much as they would under a pure finance approach."[27]

Pensions compare their assets to their liabilities to calculate their financial health; that is, the investments they hold today relative to the benefits they must pay in the future. Using these figures, they calculate the funding ratio — that is, assets divided by liabilities — and the plan's unfunded liability, which is the net of assets and liabilities.

Second, plans can easily hedge against interest rate risks by holding low-risk bonds in their investment portfolios; if interest rates on newly issued bonds fell, thereby increasing the value of the plan's liabilities, a portfolio of existing bonds would rise in value due to their higher prices, keeping plan funding levels about constant. The fact that public pensions choose not to hedge their interest rate risk is not a reason for accounting rules to cover it up. Finally, a central point of fair market valuation is that how a plan is funded is distinct from the value of its liabilities. If a plan chooses to fund its liabilities on a smoothed basis to avoid year-to-year fluctuations in contribution rates, that is a policy decision distinct from the value of those liabilities at any given time.

While municipal bonds may appear to be the appropriate source for pension discount rates, Brown and Wilcox (2009) point out that in practice, accrued public pension liabilities have proven to be safer than explicit state/local government debt.[30] Even when localities have effectively defaulted on their obligations, such as with New York City in the 1970s or Orange County, Calif., in the 1990s, pension benefits continued to be paid. Thus, Brown and Wilcox argue that a derivative of U.S. Treasury yields is the most appropriate.[31]

For simplicity, the calculations in Table 2 are based upon a 4 percent discount rate. This rate is above current Treasury or Missouri municipal yields, but might be thought of as approximating rates over a longer period of time.

In all cases, funding ratios decline and unfunded liabilities grow. For instance, MOSERS falls from a funding ratio of 73 percent to only 42 percent, while unfunded liabilities rise from $2.9 billion to $11.1 billion. Under fair market valuation, MPERS is particularly poorly funded; it began with a GASB funding ratio of only 43 percent, itself based upon an aggressive 8.25 percent discount rate. Under fair market valuation, MPERS's funding ratio falls to below 24 percent.

While all plans suffer, the effects of fair market valuation on unfunded liabilities and funding ratios are smaller for the Missouri local plan than the others, because MOLAGERS's 7.25 percent assumed return is lower than the 8 to 8.25 percent rates that other plans assumed. In other words, MOLAGERS depends less upon market risk to derive its baseline GASB funding results, so it suffers less from a shift to fair market valuation.

Overall, the five Missouri pensions together are 46 percent funded using a risk-adjusted 4 percent discount rate. Unfunded liabilities total nearly $54 billion, far above the $11 billion figure calculated using GASB assumptions. The difference between the two represents the degree to which Missouri pension plans depend upon an investment risk premium to make their financing viable. This difference also represents the size of the contingent liabilities imposed on future taxpayers.

WHY DOES IT COST SO MUCH TO GUARANTEE FUTURE PENSIONS?

The results already presented may strike some as counterintuitive. Yes, the idea of contingent liabilities makes sense, and guaranteeing against them presumably

increases the cost of pension funding. But does it double the cost? Why are these results so extreme?

We first point out that these results are not derived simply from theory, or from how much some academic says a fully funded pension "should" cost. These results are consistent with the choices investors make every day as they buy and sell risk in financial markets. So there should not be much question that they are true. Rather, it is a question of understanding why individuals value risk the way they do.

The answer is that uncertainty regarding pension financing poses significant costs for the taxpayer. Not simply because they cannot plan ahead, nor because they would rather pay a single constant contribution rate rather than high rates in some years and low rates in others. It is because stock prices are correlated with the state of the economy. This means that plans will become underfunded during bad economic times. Contributions to pensions will need to rise at the same time that tax revenues are low, unemployment is high, and taxpayers have already seen their own 401(k) balance hit. As the state of Washington's actuary has written with regard to its own plans' experiences, "Weak economic environments were correlated with weak investment returns. Lower investment returns created the need for increased contributions at a time when employers and members could least afford them."[32]

This has been the experience around the country: amidst a recession, scarce government resources have been reallocated to pension funding, demanding either higher taxes or reduced expenditures on other government programs. This helps illustrate why a market valuation approach

Under current pension accounting rules, which the Governmental Accounting Standards Board establishes, a public pension plan discounts its liabilities using the rate of return the plan assumes will be generated by the portfolio of assets it holds.

TABLE 2: Missouri Pension Financing Under GASB Accounting and Fair Market Valuation

	MOSERS	MOLAGERS	MPERS	PSRS	PEERS	Total
Expected return	8%	7.25%	8.25%	8%	8%	8%
Liabilities	$10,793,651,577	$5,120,274,198	$3,297,589,869	$34,383,430,575	$3,549,348,463	$57,144,294,682
Assets	$7,897,167,203	$4,274,440,345	$1,427,290,718	$29,387,486,429	$3,028,757,171	$46,015,141,866
UAAL	$2,896,484,374	$845,833,853	$1,870,299,151	$4,995,944,146	$520,591,292	$11,129,152,816
Funding ratio	73.2%	83.5%	43.3%	85.5%	85.3%	80.5%
Risk-adjusted discount rate	4%	4%	4%	4%	4%	4%
Liabilities	$19,011,861,315	$8,123,676,900	$6,013,331,223	$60,562,730,689	$6,251,797,203	$99,963,397,330
UAAL	$11,114,694,112	$3,849,236,555	$4,586,040,505	$31,175,244,260	$3,223,040,032	$53,948,255,464
Funding ratio	41.5%	52.6%	23.7%	48.5%	48.4%	46.0%

Source: Author's calculations from most recent plan CAFRs and actuarial valuations.

[T]he reported funding health of a plan is extremely sensitive to the discount rate chosen.

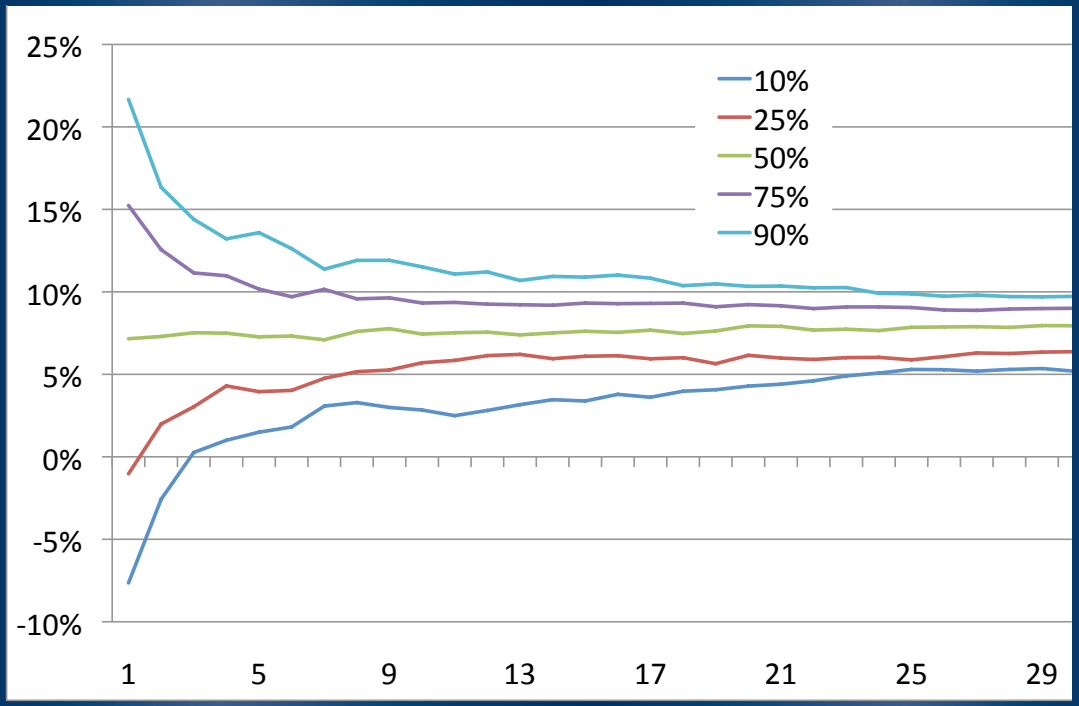
makes sense: it is not "the government" that bears the risk of pension funding. As the Congressional Budget Office points out, "The government does not have a capacity to bear risk on its own."[33] Rather, government *transfers* risk between different stakeholders, who include taxpayers, public employees, bondholders, and those who receive funds from the government. Thus, it makes sense to value that risk as these stakeholders do, using market prices that reflect how much individuals demand in order to bear risk and how much they are willing to pay to part with it.

In order to avoid such risk, taxpayers would be willing to pay a single constant pension contribution rate through good times and bad, even if that rate were significantly higher than the average of the varying rates paid using investment returns that were high but uncertain. How do we know this? Through the behavior of investors in financial markets every day. Millions of knowledgeable investors around the world hold safe investments such as long-term U.S. Treasury securities, with durations up to 30 years, instead of riskier but higher-yielding investments such as stocks. The low yields offered on such safe investments reflect the returns investors are willing to forgo in order to receive protection against the small — but *not* zero —chance of doing even worse. Thus, while some have mistakenly interpreted a riskless discount rate as a "worst-case scenario,"[34] a moment's reflection shows why this cannot be the case.

OBJECTION: LONG TIME HORIZONS

The behavior of investors belies that claim from public pensions that the "long-term" nature of their investing allows them to effectively ignore risk.

FIGURE 4: Distribution of Mean Returns Over Varying Holding Periods



This claim is based on the idea of "time diversification," which holds that the risk of investments, like stocks, declines over longer holding periods. If the government is perpetual, then it can focus on the long term and ignore shorter-term risk. The problem is that most financial economists believe that such ideas about "diversifying over time" are wrong. Indeed, a simple Internet search on that phrase "time diversification" will often pair it with the words "fallacy," "myth," and other such hints that caution should be used in applying the theory to multi-billion dollar investments. Even the investment firm Vanguard — well-known as an advocate of buy-and-hold investing — states that "there is little evidence to support the notion that time moderates the perceived volatility inherent in risky assets."[35]

Why is this the case? To illustrate, Figure 4 simulates the distribution of investment returns over different holding periods, assuming an 8 percent mean return and a standard deviation of returns of 10.4 percent. In the first year, returns vary significantly: 10 percent of returns are above 22 percent and another 10 percent are losses greater than -8 percent. But as the holding period increases, the distribution of average returns narrows. After 30 years, for instance, the 10th-90th percentile values have fallen to 10 percent and 5 percent, respectively. These figures appear to support the view that long-term investors need not worry about risk.

But now consider an alternate illustration based on the same underlying data. Instead of looking at rates of return, we look at actual dollar amounts. Using the same returns, we calculate the end value of $1 invested and held over varying lengths of time (Figure 5). While average returns appear to grow less risky over time, the opposite is the case for the actual dollar amounts invested. For instance, after a single year of investment, the median value is $1.06 and 80 percent of outcomes lie between 95 cents and $1.19, a gap difference of about 10 percent on the high and the low sides. After 10 years, however, the worst 10 percent of outcomes are worth 30 percent less than the typical outcome; after 20 years, the gap is 49 percent and after 30 years, 53 percent. A similar pattern holds for returns lying above the mean.

The simulation demonstrates an ever-widening distribution of investment outcomes and this distribution never narrows, no matter how long the investment is held. How are these two results consistent? It is because the effect of compounding over long time periods trumps the effects of a narrower distribution of average returns. And public pensions do not pay benefits with average rates of return; they pay them with dollars of investment income. The risk to that investment income does *not* shrink over time. This explains why guarantees against low market returns — which should be less expensive over long periods, if the time diversification argument is correct — actually grow *more* expensive over time.[36]

As Nobel Laureate Paul Samuelson put it:

> Invest for the long term, the theory goes, and the risk lessens. Is the dogma true as told? Alas, no. … Most of the time the buy-and-hold common stock investors do beat their more cautious

Under GASB's newly issued Rules 67 and 68, beginning in 2013, pensions will be required to publish actuarial figures using discount rates 1 percentage point above and 1 percentage point below the plan's chosen rate.

If public pension benefits are guaranteed — as they are intended to be, and as legal rulings and state constitutions have determined them to be — then they should be discounted using the interest rates that the markets pay on guaranteed investments, such as U.S. Treasury securities.

> neighbors; and, as the time horizon becomes larger, the odds do grow that the bold holders of stock will win the duel. But it is also true that a longer time horizon brings bigger losses when an inevitable loss does occur. … Ask yourself: Will stepping down toward a poverty level, when that rarely but inevitably does happen, outweigh for me the pleasures that occur in those likely outcomes when my equity nest egg does increase?[37]

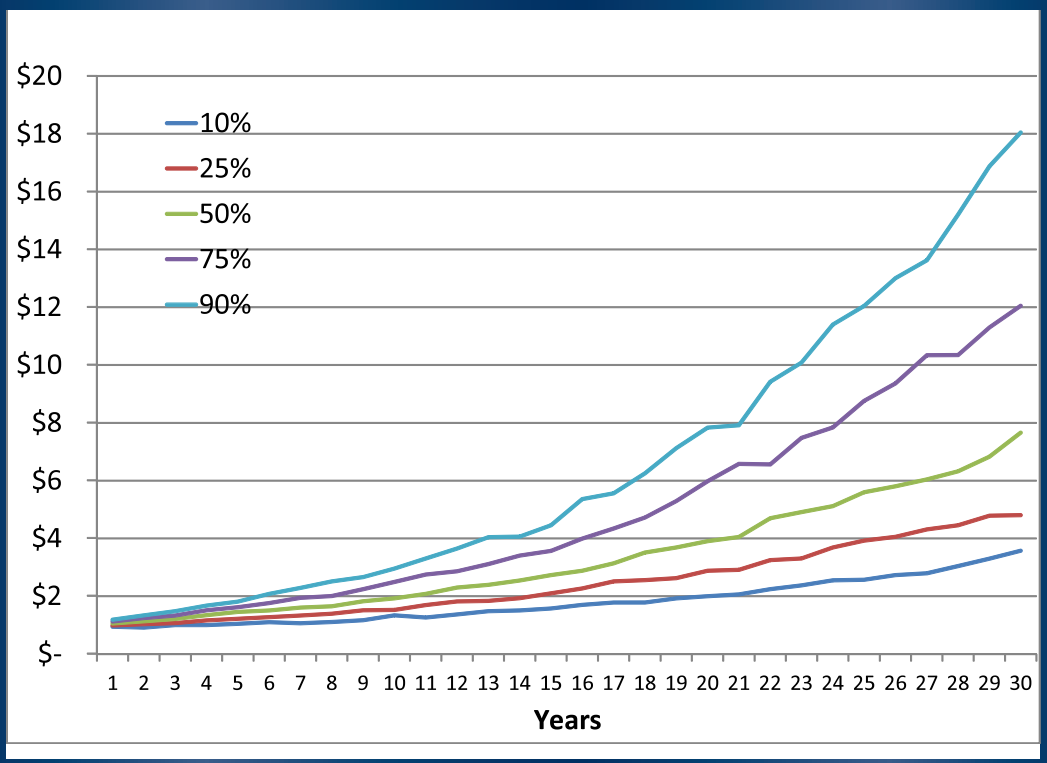
Thus, the claim that the long time horizons for public pension financing allow the plans to ignore market risk lacks support among experts in the field.

HOW DO OTHER PENSION PLANS MEASURE THEIR FINANCING?

It is worth noting that pension plans in other sectors value their liabilities differently than U.S. public plans. Private sector corporate DB pensions are required to value their liabilities using the yield on a portfolio of high quality corporate bonds. As of November 2012, the yield in the Citibank Liability Index was 3.9 percent.

Discounting corporate pension liabilities using a corporate bond rate makes sense: the yield on corporate bonds is based upon the low, but not zero, probability that the corporation will go bankrupt and default on its payments. In such a case, the corporation also would likely default on its pension benefits (in reality, the plan would be passed off to the Pension Benefit Guaranty Corporation, which, up to a limit, insures most benefits against loss. Employer contributions finance this coverage and thus the coverage is distinct from the discount rate to be applied to the plan's

FIGURE 5: Distribution of Values of $1 Initial Investment



liabilities.) In other words, the risk of the discount rate roughly matches the risk of the benefit liabilities. Public employee pensions are safer than corporate pensions in that their benefits generally are guaranteed in full by law and the plan sponsor — the government — has the power to tax. This indicates that the public pension discount rate should be *lower* than the corporate rate, not more than 4 percentage points higher.

The common response when discount rates for private DB plans are raised is that private plans should use low rates because, unlike public plans, there is the chance that a private pension could be discontinued. A public plan, it is said, is perpetual and therefore different rules should apply. In fact, because public plans are assumed not to go out of business, it also should be assumed they will continue to pay benefits in full. If so, a public plan's liabilities should be considered more binding than those of a private pension and thus a *lower*, not a higher, discount rate should be used.

If GASB-type accounting rules were the most appropriate for public employee plans, one would expect that public employee plans in other countries would follow similar accounting practices as U.S. public plans. In fact, most do not. In Canada, public employee pensions must follow similar rules to U.S private plans. In the Netherlands, public funds discount their liabilities using the riskless rate of return, such as from U.S. Treasury securities, which currently yield about 1.75 percent over 10 years and 2.5 percent over 20 years. In the United Kingdom, public plans discount their liabilities at 3 percent, the expected growth rate of gross domestic product.[38]

In addition, standards established by the International Public Sector Accounting Standards Board (IPSASB) — essentially the international version of GASB — dictate that the discount rate should not incorporate a risk premium. The standards also say that they should be based upon government bonds or high-quality corporate bonds, not, as is the case for U.S public pensions, on the expected return on stocks, private equity, or hedge funds.

Thus, the accounting rules for U.S. public pensions are at odds with how similar pensions are regulated both here and abroad. Finally, as pointed out earlier, almost no government agency other than GASB accepts the "government is special" argument. Beginning in 2013, the National Income and Product Accounts calculated by the federal Bureau of Economic Analysis will measure pension obligations using fair market valuation techniques. That is to say, pension liabilities that the plans report will now be inconsistent with those same liabilities as reported in the official ledger book of the United States economy.[39]

HOW DO PENSION ACCOUNTING RULES AFFECT RISK-TAKING?

The debate about pension accounting rules is not merely an argument about valuation of liabilities, important as that may be. Because investments with higher risk have higher expected returns, current actuarial standards incorrectly imply that a pension plan that takes more risk immediately becomes better funded as a result. For instance, if pension plans across the country shift from portfolios with an expected return of 8 percent

The way to calculate the full value of public pension liabilities is through a risk-adjusted discount rate; that is, an interest rate derived from investments that have approximately the same risk as the liability to which the discount rate is being applied.

Overall, the five Missouri pensions together are 46 percent funded using a risk-adjusted 4 percent discount rate. Unfunded liabilities total nearly $54 billion, far above the $11 billion figure calculated using GASB assumptions.

to riskier investments with expected returns of 8.5 percent, the value of their liabilities — under GASB accounting rules, at least — would immediately decline by about 10 percent, before a single penny of higher returns is earned.

The effect of discounting at the expected return on a risky investment portfolio is so powerful that a pension could improve its financial health — again, according to GASB rules — by literally *burning* any safe assets in its portfolio.[40] Destroying cash or Treasury bonds would reduce the plan's assets, but would shift the overall portfolio toward higher risk and higher expected returns, which allows for a higher discount rate to be applied to liabilities. The fact that it is better to assume high returns for the future than to actually have money today illustrates the absurdity of GASB's accounting rules. Robert Merton, winner of the Nobel Prize in economics, warns:

> Because a larger expected return on assets generally implies that the assets have greater risk, the pension fund that invests in riskier assets will have a lower actuarial valuation of its pension liabilities and thus a lower required contribution rate. This process not only distorts the economic valuation of pension liabilities, it creates incentives for more risk taking in the pension fund.[41]

Empirical research has borne out Merton's concerns that GASB accounting rules encourage excessive risk-taking. For instance, Biggs (2011) shows that, since the financial crisis, public plans are actually taking *more* investment risk than before.[42] This suggests that at least some pensions are "doubling down" on risk to restore their weakened finances.

Likewise, economists Aleksandar Andonov and Rob Bauer, of Maastricht University, and Martijn Cremers, of the University of Notre Dame, compared how public and private sector pensions in the U.S., Canada, and Europe manage their investments.[43] They point out that, according to economic theory, as a pension plan's population ages — meaning there are greater numbers of retirees relative to workers — and as interest rates on government bonds fall, a pension should take a more conservative investment approach and assume a lower discount rate for its liabilities. Private sector pensions and public plans outside the U.S. follow this logic, according to data the authors examined. U.S. public sector plans, by contrast, have taken on *greater* investment risk, because doing so allows them to lower the accounting value of their liabilities and put off difficult decisions such as raising contributions or lowering benefits. The problem with this strategy, of course, is that this investment risk is shifted onto future taxpayers. These accounting-driven choices by public sector pensions, the authors say, "have large economic effects and could have potentially severe future consequences."

MARKET VALUATION MYTHS

Fair-market valuation has a lot to say about public pensions, about how well-financed they are and what strategies would — and would not — help make them better funded going into the future. But it is important to note certain things the market valuation approach does not say – even though many public pension advocates claim it does.

For instance, some people assert that the market valuation critique claims that public pensions will earn no more than the riskless rate of return on their investments. Monique Morrissey of the Economic Policy Institute states that "… the critics contend that when pensions calculate the amount of money they need to set aside today to make promised payments to retirees in the future, they should assume that pension investments will earn rates equivalent to those of Treasury bonds and similarly low-risk to no-risk assets."[44] Similarly, columnist Gerard Miller writes, "Pension funds are not going to invest their entire portfolio in 3 percent Treasury bonds right now — or ever — so the risk-free model is not even descriptive of reality and has little normative value."[45]

In fact, economists say nothing of the sort. The issue is not whether pensions can achieve 8 percent returns "in expectation." In expectation, they can achieve almost any return they wish by taking sufficient risk. For instance, there are mutual funds that double the expected returns on the S&P 500 index — of course, by doubling the risk. Economists argue simply that pensions cannot achieve 8 percent returns without taking risk — something which is unquestionably true — and that this risk should not be interpreted as a benefit to taxpayers without any cost. As the examples here have shown, it is not necessary to assume that pensions earn the riskless return on their investments in order to justify market valuation. You need only show that (a) benefits are guaranteed, and (b) there is a cost to guaranteeing them. This cost is best reflected in the prices that participants are charged and pay in financial markets, where similar sorts of guarantees are traded every day.

The use of a risk-adjusted discount rate captures the value of taxpayers' obligation to make good on benefit promises even if pension investments do not achieve their assumed returns. This obligation has legal, political, and moral force alongside a significant monetary value. While GASB acknowledges that this obligation exists, current GASB pension accounting rules entirely ignore its value.[46]

RECENT EVENTS: REVISED GASB RULES

The issue of public pension valuation has been evolving quickly. On June 25, 2012, GASB released Statements 67 and 68, which revise earlier accounting guidelines for public sector pensions.[47] These revisions make two important changes to help pensions value their assets and their liabilities.

First, when pensions compare assets to liabilities, they must rely on the market value of assets, rather than an actuarial value that smoothes investment returns over five to 10 years. Smoothing means that investment losses or gains this year would not be fully incorporated into a plan's funding disclosures until at least 2016. Eliminating smoothing would reduce current funding ratios by about 10 percentage points. More importantly, eliminating smoothing would show the true volatility of plan funding and the degree to which even supposedly healthy plans depend upon risky investments.

Second, the discount rate used to value plan liabilities would change. Instead of

[U]ncertainty regarding pension financing poses significant costs for the taxpayer.

Contributions to pensions will need to rise at the same time that tax revenues are low, unemployment is high, and taxpayers have already seen their own 401(k) balance hit.

applying an 8 percent discount rate to all liabilities, under the new rules, this rate could be applied to benefits only through the period in which the plan's assets are expected to last. Following the exhaustion of plan assets, any remaining liabilities must be valued using a lower municipal bond rate. This split discount rate approach would reduce pension funding ratios further, by 10 percentage points or so.

Any step toward reality would seemingly be welcome. But GASB's new approach to discounting is, if anything, even less economically coherent than the current rules. To the degree there is any insecurity to public pension benefits, it is due to plan underfunding. Because benefits that are backed by assets are presumably more secure, they would be discounted using a lower interest rate. Likewise, if benefit liabilities that are not backed by assets are less secure, they might be valued using a higher discount rate. Even if you accept the idea of a bifurcated discount rate, the new GASB rules have economic logic precisely backward.[48]

But the dangers of GASB's discounting rules are far from merely academic. Like the current rules, the new regulations cement in place the flawed notion that boosting investment risk makes a pension better funded, before a dime of higher returns has been realized. Under the current rules, a pension that shifts to riskier investments can discount its liabilities using a higher interest rate. Under the new rules, a plan that takes greater investment risk can assume its trust funds will last longer and therefore fewer years of benefits would be discounted using lower municipal bond rates. The incentives to take greater investment risk, particularly at a time when state and local governments would be hard-pressed to increase pension funding, are obvious. And, as shown already, these incentives have real effects on the amount of risk public sector pensions choose to take.

GASB's revised pension accounting rules may have been designed to placate critics of their current approach without excessively angering public pension administrators, who are effectively GASB's "customers." However, these changes neither accurately measure the value of unfunded public pension liabilities nor eliminate incentives for pensions to take excessive investment risk.

OPTIONS FOR REFORM

This paper analyzed the accounting for DB pension liabilities, finding the plans to be significantly more expensive than is reported under current GASB accounting rules. Funding public employee pensions under current benefit structures implies taxpayer costs that far exceed private employer costs for 401(k)s and other DC pensions. This cost difference both stretches state and local government budgets and generates inequities in compensation between public and private employees.

DC and cash balance (CB) pension plans also offer advantages in the area of human resources, in terms of attracting and retaining desired employees. A cash balance plan is a form of defined benefit pensions in which benefits are based on a notional investment account rather than final salary and years of service. To an employee, the retirement benefits earned in a given year are an important part of

their overall compensation, along with salary, health coverage, and other fringe benefits. The advantages to DC and CB plans stem from the way in which pension benefits accumulate over time.

Under DB plans, benefit accruals follow an unusual pattern. An employee may accumulate very little pension benefits over the first two decades of employment. Costrell and Podgursky (2009) show that an employee with a DB pension would have accrued only about 15 percent of their total future benefits by the time he or she is in his or her mid-40s.[49] In the following decade, however, benefit accruals skyrocket. For a Missouri teacher, Costrell and Podgursky show, net pension accumulations of less than $100,000 as of age 45 rise to approximately $650,000 by age 55. But what happens after that? Net benefit accruals actually decline, meaning that the amount of additional benefits earned each year is less than the amount the employee must contribute to the program. From age 55 to 65, they show, a Missouri teacher's "pension wealth" falls by about $125,000.

What do these benefit accrual patterns mean for attracting and retaining employees? First, it means that the DB pensions carry very little value for employees who do not plan on remaining in government service over a full career. To such workers, a DB pension plan adds essentially nothing to their compensation, making public employment less attractive. Moreover, public employees who are not covered by Social Security — in Missouri, principally teachers — could leave government after 10 to 20 years of service with very little in the way of future retirement benefits. While DB pension may be very generous for full-career employees, they provide much less for the majority of workers who spend only a partial career in government service. A recent report from the Maine Unified Retirement Plan Taskforce highlighted issues regarding career length. The report pointed out that while a full-career employee does very well under traditional DB pension plans, the majority of public employees who fail to work a full career receive much lower benefits.[50]

To illustrate the effects of shorter job tenures, consider an employee who retires after 32 years in MOSERS, receiving a replacement rate of about 41 percent of final earnings. But an employee who began work at the same time but retired after half that job tenure — 16 years of service — would not receive half that replacement rate, 20 percent of earnings. Rather, his replacement rate would be about *10 percent* of earnings just prior to retirement, meaning that to avoid an inadequate income in retirement, he must save at extraordinary rates later in his career to meet the 70-80 percent replacement rate that financial advisors recommend. Assuming a DC pension account earned the same 8 percent return MOSERS projects for its own investments, a half-career employee with a DC plan would receive a replacement rate at retirement of about 30 percent. A government employer may wish to attract young, mobile employees who carry valuable skills but plan on staying in government for only a decade or so. For these employees, a DB pension does little to make government employment more attractive.

Now consider a mid-career employee who has become "burned out." He

[A]midst a recession, scarce government resources have been reallocated to pension funding, demanding either higher taxes or reduced expenditures on other government programs.

Public employee pensions are safer than corporate pensions in that their benefits generally are guaranteed in full by law and the plan sponsor — the government — has the power to tax. This indicates that the public pension discount rate should be lower than the corporate rate, not more than 4 percentage points higher.

might wish to change jobs and his employer might also wish him to do so. Yet a 45-year-old employee who exits government leaves literally hundreds of thousands of dollars of pension benefits on the table relative to staying through age 55, because he would be leaving at precisely the time in which pension accumulations are most rapid. Regardless of his own or his employer's desires, it would be extremely difficult for this employee to quit government service.

Finally, consider a 55-year-old employee who is a top performer, one who is good at his job, and would wish to remain in it. By doing so, however, he potentially sacrifices $100,000 or more in net pension benefits, because the annual contributions exceed the additional benefits he will earn. Not surprisingly, most employees will quit at this point, even if both they and their employers might wish them to stay.

In all three scenarios, the incentives embedded in DB pensions work contrary to reasonable human resources goals of state and local governments.

Under DC plans, by contrast, employees accumulate future pension benefits on a steady basis, with approximately the same amount (as a percentage of salary) earned each year. For instance, if an employer makes a DC contribution equal to 5 percent of salary, that amount is accumulated each year regardless of age. These smoother accrual patterns eliminate the "push and pull" incentives embedded in typical DB plan structures.

Costrell and McGee simulate a DC/CB-type reform in which benefit accumulation rates are constant by age/tenure.[51] They find that it raises employee retention among younger workers, increases voluntary turnover among mid-career workers, and lowers retirement rates for employees with long job tenure. That is, a DC- or CB-type pension reform could address some of the major human resources shortcomings of current DB pension systems.

The preferred type of reform depends upon the preferences of the sponsoring employer and the circumstances of the employees who would participate in the plan. For instance, Missouri teachers lack Social Security coverage, while most other Missouri public employees are covered by Social Security. This should not be seen as an overall disadvantage for teachers, as Social Security generally offers low benefits relative to contributions. However, without Social Security — which offers a DB benefit structure — teachers might prefer a hybrid DB/DC approach or, preferably, a CB plan. A CB plan offers the labor supply incentives of a DC plan, but with a guaranteed benefit similar to that of a DB pension. On the other hand, as other Missouri public employees already have a DB pension through Social Security, reforms for them might include a greater DC component.

However, it is important to remember that, in terms of financial accounting, CB plans are a subset of the DB pension universe and subscribe to the same accounting principles. One might think that because CB plans generally offer guaranteed returns of well less than 8 percent that they are not subject to the same accounting issues as conventional DB plans. However, the CB plan's accounting — which determines the level

of annual taxpayer contributions — is determined by the assumed return on the plan's investments, not the guaranteed return offered to participants on their virtual retirement accounts. For instance, the state of Nebraska runs a CB plan for its employees. The plan itself offers a guaranteed return of at least 5 percent on credits to employees' accounts, but assumes a 7.75 percent return on the plan's underlying investments and uses this return to calculate annual required contributions to the plan.

TRANSITION COSTS FOR DC PENSIONS

One essential difference between DB pensions and DC plans is that DC plans cannot generate unfunded liabilities. Under a DB plan, the employer promises employees a fixed retirement benefit regardless of how the plan's investments fare. In a DC plan, by contrast, employers promise employees a fixed contribution, say, 5 percent of salary. Once that contribution is made, the employer's obligation is fulfilled.

While DC plans cannot generate new unfunded liabilities, shifting to a DC pension plan does not alter unfunded liabilities from the existing DB plan. It does not eliminate them, as some DC reformers might wish to see. Those unfunded liabilities are effectively debts of the governments and must be honored. Nor, however, does shifting to DC plans increase costs, as some critics of DC plans contend. The idea that there are "transition costs" involved with shifting to DC pensions is widespread, but incorrect.

Pension advocates rely on financial disclosure rules that the Government Accounting Standards Board (GASB) generates regarding how quickly a DB plan must pay down — or "amortize" — its unfunded liabilities. A plan that is open to new employees may amortize its shortfalls over a longer period of about 30 years, while a closed plan must amortize its unfunded liabilities sooner.[52] This faster payoff means a temporary period of higher pension amortization costs, which is termed the "transition cost."

This creates a seemingly illogical conclusion: the bigger the plan's unfunded liabilities, the tougher it is to move to a DC plan that will not create more unfunded liabilities.

However, Costrell (2012) shows that these transition costs are largely a myth.[53] Pension advocates such as the National Institute for Retirement Security claim that "accounting rules can require pension costs to accelerate in the wake of a freeze." Costrell points out that GASB rules require nothing of the sort. GASB rules do not determine plan funding, they dictate only accounting figures that pensions must disclose. State and local governments set funding policy and regularly violate GASB rules, sometimes paying more than GASB requires and — too often — paying less. If a government wished to follow its current amortization schedule even as it shifts to a DC plan, nothing prevents the agency from doing so. And, as Costrell points out, some states that have moved to DC pensions have done exactly that.

Moreover, if a DC plan is made available as a new tier within the *existing* DB pension — as was done in Utah's pension reforms — then these amortization rules

[E]conomists and other policy analysts agree that the accounting rules that public pensions use significantly understate the funding shortfalls facing these plans.

do not apply. Because employee payroll under the overall plan is unchanged, GASB amortization payments also do not change.

More broadly, there is no strong policy reason that amortization payments should change even if the DC plan is set up separately. Total employee payroll has not changed. Plan sponsors, not participants, nearly always make amortization payments, so it makes little difference under which plan employee payroll is assigned. Finally, a pension's unfunded liability is a debt of the government that legally has to be paid off, regardless of how many or few new employees enter a DB pension plan. Having new employees participate in a new DC pension makes no difference to what the old DB plan owes. Costrell shows that pension plans and their actuaries will acknowledge all this, although it is often hidden in the footnotes of their reports headlining massive "transition costs."

Even after a DC reform, governments may continue to amortize unfunded liabilities as they previously have. There is no legal, economic, or policy reason to do otherwise, and states that have adopted DC pensions have not had to deal with transition costs.

CONCLUSION

Around the country, Americans in many capacities are concerned about the funding of public employee retirement plans. In recent years, plans have suffered from poor investment returns and insufficient funding, even as the Baby Boom wave of public employees begins to retire. Moreover, economists and other policy analysts agree that the accounting rules that public pensions use significantly understate the funding shortfalls facing these plans. These rules, which differ significantly from those that private plans and public employee pensions in other countries use, inappropriately use the expected return on a risky portfolio of investments to value future benefit liabilities that the law guarantees. Using a risk-adjusted discount rate, which is consistent with both economic theory and the way in which private markets value liabilities, shows public employee pensions nationwide suffer from multi-trillion dollar funding shortfalls.

The story in Missouri is no different. The five Missouri plans examined here have varying states of funding health under current GASB accounting rules. Using accurate accounting for plan liabilities, their measured financing suffers significantly. On average, the Missouri plans are only 46 percent funded and face unfunded liabilities topping $50 billion. Some plans, such as Missouri teachers, are very poorly funded. Current pension accounting standards also encourage pensions to take excessive investment risk, risk that is not disclosed or valued as part of pension accounting reports.

Reforms to public pensions must begin with better accounting. Accurate accounting will show the extent of public plan underfunding. It also will show, however, that taking more investment risk — that is, assuming a higher rate of return on plan investments — will do nothing to make unfunded liabilities smaller. A better

Reforms to public pensions must begin with better accounting. Accurate accounting will show the extent of public plan underfunding. It also will show, however, that taking more investment risk — that is, assuming a higher rate of return on plan investments — will do nothing to make unfunded liabilities smaller.

understanding of how large pension funding problems are and what policies will — and will not — address these problems is more likely to lead to constructive policy solutions.

Changing plan structures, to either a defined contribution or cash balance approach, will not eliminate existing unfunded liabilities. But these alternate approaches may reduce or eliminate the accumulation of additional unfunded liabilities, giving state and local governments breathing room to determine how to fund shortfalls in existing DB plans. Moreover, DC and CB plans are likely superior to current DB pension structures in terms of attracting and retaining quality employees.

The appropriate reforms to enact may differ by plan and worker type. Missouri workers who have Social Security benefits may desire a different plan structure than Missouri teachers, who currently do not have Social Security coverage. In all cases, though, reforms can help make public employee plans more financially sustainable while eliminating large, contingent liabilities to the taxpayer.

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NOTES

[1] Munnell, Alicia H., Jean-Pierre Aubry, Josh Hurwitz, Madeline Medenica, and Laura Quinby. "The Funding Of State And Local Pensions: 2011-2015." Center for Retirement Research, Boston College. May 2012.

[2] Author's calculations from Public Plans Database.

[3] The database is available at: http://pubplans.bc.edu.

[4] Academic discussions of pension accounting include Novy-Marx, Robert, and Joshua Rauh, 2009. "The Liabilities and Risks of State-Sponsored Pension Plans." *Journal of Economic Perspectives* 23(4), 191-210; and Biggs, Andrew G. "An Options Pricing Method for Calculating the Market Price of Public Sector Pension Liabilities." *Public Budgeting and Finance*, Fall 2011.

[5] For individuals spending part of their careers in public employment not covered by Social Security and part under Social Security-covered employment, the Government Pension Offset and Windfall Elimination Provision may affect the Social Security benefits they or their spouses are eligible to receive.

[6] Actuarial fairness in claiming ages implies that individuals receive approximately the same total lifetime benefits regardless of the age at which they retire. Early retirees receive lower benefits but for a longer period, while later retirees receive higher benefits for fewer years. Social Security reduces benefits by almost 7 percent for each year of early claiming a rate that is close to actuarially fair. Most public plans, including MOSERS, reduce benefits by about 6 percent for each year the individual claims prior to the full retirement age. This implies that early retirees tend to receive higher lifetime benefits. As a result, employees may retire earlier under such rules.

[7] The average age of retirement in the Public Plans Database as of 2009 was 60, although only a small number of plans report ages of benefit claiming. The typical new retiree had almost 24 years of government service.

[8] Missouri State Employees Retirement System Annual Actuarial Valuation, June 30, 2012. Conducted by Gabriel, Roeder, Smith & Company, Actuarial Consultants.

[9] MOSERS's allocation to alternatives is high relative to other plans nationwide, where the average allocation reported in the Public Funds Survey is 11 percent. However, MOSERS has somewhat below-average allocations to stocks and above-average allocations to bonds, so the plan's overall risk cannot easily be compared to that of other programs. While historical risk can be compared using past returns, if asset allocations change, which is occurring throughout the pension world, historical risk may not represent risk going forward.

[10] These figures assume that the normal cost varies with the natural log of the discount rate, which in other instances has provided a good fit.

[11] See DuZebe, Robert S. "Study Reflecting Impact to the FRS of Changing the Investment Return Assumption to one of the following: 7.5 percent, 7.0 percent, 6.0 percent, 5.0 percent, 4.0 percent and 3.0 percent." Milliman. March 11, 2011. A similar analysis was conducted in Jones, Norman L., Brian B. Murphy, and Paul Zorn. "Actuarial Methods and Public Pension Funding Objectives: An Empirical Examination." Presented at Society of Actuaries Public Pension Finance Symposium. May 2009, and Office of the State Actuary. "Washington State 2009 Actuarial Valuation Report." October 2010; and Office of the State Actuary. "2010 Risk Assessment: Moving Beyond Expectations." August 31, 2010.

[12] This view derives from the Modigliani-Miller theorem of corporate finance, which holds that (under certain conditions) the value of an asset or liability is independent of how it is financed. See Modigliani, F.; Miller, M. (1958). "The Cost of Capital, Corporation Finance and the Theory of Investment." *American Economic Review*, 48 (3): 261–297.

[13] Brown and Wilcox discuss legal protections for accrued pension benefits in Brown, Jeffrey R., and David W. Wilcox. "Discounting State and Local Pension Liabilities," *American Economic Review*, vol. 99, May 2009.

[14] As of 2009, MOSERS's projected return assumed 1.4 percentage points of "alpha," meaning a return generated by active portfolio management that is in excess of that provided merely as compensation for the risk of the portfolio. In other words, the portfolio alone would have an expected return of 7.1 percent while active management would raise the return to 8.5 percent. However, there is little evidence that MOSERS or any other Missouri pensions have been capable of generating excess returns at this level. See Howe, John S. "A Comparison of Missouri Pension Plans." Show-Me Institute Policy Study No. 34, December 2012.

[15] The relevant case is Firemen's Retirement System v. City of St. Louis, 2006 WL 2403955 (Mo.App. E.D. Aug 22, 2006).

[16] Throughout the example, I calculate present values using continuous discounting. The present value equals the size of the future payment divided by the exponential of (r*n), where r is the annual discount rate and n is the number of years until the future payment will be made.

[17] The shaded blue area is stylized for illustrative purposes; in fact, outcomes either above or below the bounds of the blue shaded area are possible.

[18] The listed numbers contain a $1 discrepancy, reflecting rounding error.

[19] This result is based on a principal known as "put-call parity." See Stoll, H.R. 1969. "The Relationship Between Put and Call Option Prices." *The Journal of Finance* 24 (December): 801-824.

[20] Kohn, Donald L. "Statement at the National Conference on Public Employee Retirement Systems Annual Conference." New Orleans, La., May 20, 2008.

[21] Wilcox, David. Testimony before the Public Interest Committee Forum sponsored by the American Academy of Actuaries, September 4, 2008. Novy-Marx and Rauh present a similar argument; see Novy-Marx, Robert, and Joshua Rauh. "The Liabilities and Risks of State-Sponsored Pension Plans." *Journal of Economic Perspectives*, vol. 23, no. 4 (Fall 2009), pp. 191–210. In analyzing federal employee pensions, the CBO used a discount rate 1 percentage point above the Treasury rate. However, the CBO explicitly noted that this was because federal pensions lack the legal protections that state pension plans such as the WRS are entitled to.

[22] Reinsdorf, Marshall B., and David G. Lenze. "Defined Benefit Pensions and Household Income and Wealth." Bureau of Economic Analysis. *Research Spotlight*. August 2009. Also see Lenze, David G. "Accrual Measures of Pension-Related Compensation and Wealth of State and Local Government Workers." Bureau of Economic Analysis. April 2009.

[23] Reinsdorf, Marshall. "Actuarial Measures of Defined Benefit Pension Plans for the National Accounts." Presentation to BEA Advisory Committee Meeting, May 11, 2012.

[24] Congressional Budget Office. "The Underfunding of State and Local Pension Plans." May, 2011.

[25] For details, see: http://www.igmchicago.org/igm-economic-experts-panel/poll-results?SurveyID=SV_87dlrIXQvZkFB1r.

[26] Biggs, Andrew G. "Proposed GASB Rules Show Why Only Market Valuation Fully Captures Public Pension Liabilities." *Financial Analysts Journal*, March/April 2011, Vol. 67, No. 2: 18–22.

[27] "Report of the State Budget Crisis Task Force." July 2012. Available online at: http://www.statebudgetcrisis.org.

[28] View online at: http://missouri.municipalbonds.com/bonds/yield_curve/.

[29] Even this approach may result in too high a discount rate. State and local government debt carries a yield premium over federal debt, in part because of the higher perceived risk of default. Applying a discount rate that incorporates a default premium to a benefit that is intended to be riskless understates the cost of providing that riskless benefit.

[30] Brown, Jeffrey R., and David W. Wilcox. "Discounting State and Local Pension Liabilities," *American Economic Review* 99 (May 2009): 538-42.

[31] Even within Treasuries, however, disagreements loom. For instance, some economists point out that yields on U.S. Treasury securities — which are free from credit risk — are low in part because they are highly liquid and freely tradable, an attribute that pension liabilities neither share nor need. See Munnell, Alicia H., Richard W. Kopcke, Jean-Pierre Aubry, and Laura Quinby. 2010. "Valuing Liabilities in State and Local Plans." Issue in Brief SLP-11. Chestnut Hill, Mass.: Center for Retirement Research at Boston College. On the other hand, most public pension benefits are at least partially protected against inflation, which U.S. Treasury securities are not. Economists Joshua Rauh, of Northwestern University, and Robert Novy-Marx, of the University of Rochester, assume that these two effects are roughly offsetting and therefore use Treasury interest rates to value public pension liabilities. They discount pension liabilities at the yield on Treasury Inflation Protected Securities (TIPS) plus market expectations of inflation.

[32] Office of the State Actuary. "Washington State 2009 Actuarial Valuation Report." October 2010; and Office of the State Actuary. "2010 Risk Assessment: Moving Beyond Expectations." August 31, 2010.

[33] Congressional Budget Office, "Estimating the Value of Subsidies for Federal Loans and Loan Guarantees," August 2004.

[34] For instance, see California Legislative Analysts Office. "Summary of LAO Findings and Recommendations on the 2011-12 Budget." January 24, 2011. View online here: http://www.lao.ca.gov/laoapp/budgetlist/PublicSearch.aspx?Yr=2011&KeyCol=305.

[35] Vanguard Investment Counseling & Research. "Time Diversification and Horizon-Based Asset Allocations." 2008.

[36] For more detail on this argument, see Bodie, Zvi. "On the Risk of Stocks in the Long Run," *Financial Analysts Journal*, May-June 1995.

[37] Samuelson, Paul. "Dogma of the Day," *Bloomberg Personal Finance*, 1997.

[38] Andonov, Aleksandar, Rob Bauer, and Martijn Cremers. "Pension Fund Asset Allocation and Liability Discount Rates: Camouflage and Reckless Risk Taking by U.S. Public Plans?" (May 1, 2012).

[39] For background, see Reinsdorf, Marshall B., and David G. Lenze. "Defined Benefit Pensions and Household Income and Wealth." Bureau of Economic Analysis. Research Spotlight. August 2009. Also see Lenze, David G.. "Accrual Measures of Pension-Related Compensation and Wealth of State and Local Government Workers." Bureau of Economic Analysis. April 2009.

[40] Novy-Marx (2011): "Logical Implications of GASB's Methodology for Valuing Pension Liabilities," Working Paper, University of Rochester and NBER.

[41] Merton, Robert C. Introduction to Pension Finance, by M. Barton Waring. *Wiley Finance*. 2012.

[42] Biggs, Andrew G. "How Have Public Sector Pensions Responded to the Financial Crisis?" Pension Research Council. Working paper WP2011-18. 2011.

[43] Andonov, Aleksandar, Bauer, Rob, and Cremers, Martijn. "Pension Fund Asset Allocation and Liability Discount Rates: Camouflage and Reckless Risk Taking by U.S. Public Plans?" (May 1, 2012).

[44] Morrissey, Monique. "Discounting Public Pensions: Reports of trillions in shortfalls ignore expected returns on assets," Economic Policy Institute, April 14, 2011.

[45] Miller, Gerard. "Pension Puffery." *Governing Magazine*. January 5, 2012.

[46] Biggs, Andrew G. "Proposed GASB Rules Show Why Only Market Valuation Fully Captures Public Pension Liabilities." *Financial Analysts Journal*, March/April 2011.

[47] See Governmental Accounting Standards Board. "News Release: Adjustments to US State and Local Government Reported Pension Data." June 25, 2010.

[48] Biggs, Andrew G. "Proposed GASB Rules Show Why Only Market Valuation Fully Captures Public Pension Liabilities." *Financial Analysts Journal*, March/April 2011.

[49] Costrell, Robert M., and Michael Podgursky. 2009. "Peak, Cliffs, and Valleys: The Peculiar Incentives in Teacher Retirement Systems and Their Consequences for School Staffing." *Education Finance and Policy*. 4 (2): 175-211.

[50] State of Maine Unified Retirement Plan Task Force. 2010. Task Force Study and Report: Maine State Employee and Teacher Unified Retirement Plan. Augusta, Maine.

[51] Costrell, Robert M., and Joshua McGee. 2010. "Teacher Pension Incentives, Retirement Behavior, and Potential for Reform in Arkansas." *Education Finance and Policy*, Fall.

[52] Ongoing plans may amortize unfunded liabilities as a level percentage of employee payroll; because this tends to rise, initial amortization payments are lower. A closed plan, by contrast, has shrinking employee payroll. GASB reasons that amortizing as a level percentage of a shrinking payroll base would excessively backload amortization payments. Thus, closed pension plans should amortize unfunded liabilities more quickly, generally on a "level dollar" method that increases initial payments.

[53] Costrell, Robert M. "GASB Won't Let Me." Laura & John Arnold Foundation. May 2012.

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MISSOURI TRANSITION COSTS AND PUBLIC PENSION REFORM

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EXECUTIVE SUMMARY

Defined benefit (DB) pensions for public employees in recent years have generated high costs for state and local government budgets. In response, some elected officials have proposed shifting public employees to cash balance (CB) or defined contribution (DC) plans. One potential obstacle to such reforms are so-called "transition costs," which imply that shifting public employees from DB to alternate pension plans would increase costs, substantially and for an extended period, before any savings are realized. Claims of large transition costs have slowed reforms in a number of cities and states.

Public pension transition costs come in two types. First, accounting-based transition costs arise from perceived accounting requirements issued by the Government's Accounting Standards Board (GASB) that a closed defined benefit plan must accelerate the amortization of its unfunded liabilities that accumulated during prior years. This faster repayment of unfunded liabilities produces approximately a decade-long increase in pension costs.

However, this claim is weaker than it appears.

- GASB accounting standards are guidelines for disclosure; these guidelines are not intended to dictate funding policy. Recent reforms to GASB guidelines make clear that they are intended to measure pension liabilities, not determine how pension liabilities should be funded.
- It is very unlikely that ratings agencies or bond markets would punish a jurisdiction that enacted major pension reforms, even if it failed to make the higher "transition costs" amortization payments. Governments would not lower their amortization payments after a DB plan is closed; they would continue making the same payments as before.
- Plan sponsors that did choose to make more rapid amortization payments would reduce the accumulation of public debt, improving fiscal health and potentially lowering debt service costs.
- If a DC or CB plan were created as a new "tier" within the existing DB plan, even GASB standards would not imply higher amortization payments.
- There is no economic or policy reason to alter amortization schedules; government as a whole owes pension liabilities and neither government resources nor total employee payroll has changed.

Pension plans for state and local government employees have become increasingly underfunded in recent years, with total shortfalls nationwide ranging from approximately $1 trillion to more than $4 trillion…

The second claim for transition costs arises from the perceived need for a closed defined benefit plan to shift to more liquid, less risky assets as its participant population ages. The lower return on such assets would require higher average contributions.

However, this investment-based argument for transition costs ignores a number of key facts:

- There is no evidence that U.S. public plans currently target their investment portfolios to the age structure of their participant populations. In fact, most public plans have taken *more* risk as their participant populations have aged. Thus, the investment-based transition costs argument proposes an investment strategy that public employee systems do not themselves follow.
- Under a "fair market valuation" approach to pension accounting, which most economists and government agencies favor, the effect of a plan's closure on its liabilities would be very small. Under market valuation, public plans would value their liabilities using discount rates derived from low-risk investments such as government bonds, to match the low risk of DB pension benefits. Closing a DB plan would have only small effects on liabilities under this approach.
- A plan that chose to shift to safe investments would enjoy the benefit of lower risk and less volatility of contributions. Moving to a safer investment portfolio is not a "cost"; it is a trade between risk and return. Safer investments come with benefits, namely lower risk. Once the "cost of risk" is accounted for, shifting to a more conservative investment portfolio does not raise costs to the taxpayer.
- Increasing the liquidity of plan investments would have only small effects on expected returns. A closed plan's investments must be truly liquid only in the final years before true shutdown, which would be decades in the future. Moreover, illiquid alternative investments currently make up only a small portion of most plans' portfolios, meaning that portfolio changes to increase liquidity would be small. Moreover, research has found that public plans' investments in alternatives do not increase returns after adjusting for risk.
- If a closed DB plan and its sponsoring government wished to retain the plan's current high-risk investment portfolio, the government might offer a line of credit that the DB plan might call upon if needed. If investments in stocks are indeed low-risk over long time horizons, as many pension stakeholders appear to believe, such a line of credit would be low-risk to the sponsoring government.

Closing a DB plan to new participants does not erase the unfunded liabilities that the plan accumulated over the years, and these liabilities should be addressed through a responsible funding policy. But closing a DB plan also does not increase unfunded liabilities or require that they be repaid faster.

Most importantly, closing a DB plan does reduce or prevent the accumulation of *additional* unfunded liabilities. There are many reasons elected officials may favor or oppose shifting public employees out of traditional DB pensions into CB or DC plans. But concerns over so-called "transition costs" are largely mistaken and should not stand in the way of public employee pension reforms.

INTRODUCTION

Pension plans for state and local government employees have become increasingly underfunded in recent years, with total shortfalls nationwide ranging from approximately $1 trillion to more than $4 trillion, depending on how plan liabilities are measured. Annual required contributions have more than doubled over the past decade, and many plan sponsors were unable to make required contributions during the recession that began with the financial crisis of 2007 and the slow recovery that followed.

Many policymakers are exploring reforms to public plans, which range from incremental changes to contribution rates, retirement ages, or other plan parameters to more fundamental changes to the final earnings defined benefit approach, such as cash balance (CB) or defined contribution (DC) plans.

A cash balance plan is a form of a DB pension in which benefits are not based upon a final earnings formula. Instead, benefits are a function of contributions to a notional retirement account to which are credited interest earnings at some given rate. CB plans do not subject participants to market risk, as the interest formula is generally distinct from the returns on plan investments.[1] But CB plans allow for portability of benefits and a direct earnings-benefit link, which may be helpful in attracting and retaining quality public employees. A DC pension is similar to the 401(k) or 403(b) plans in which most private sector employees participate. Generally, both employers and employees contribute to a DC account. Employees allocate contributions between a range of investment options the employer chooses, and the employee is subject to any investment losses or gains. Unlike a DB plan, there is no guaranteed retirement benefit owed to workers at retirement, and there is no liability to plan sponsors beyond the initial employer contribution to the account. While a DC pension conversion will not eliminate current DB pension liabilities, DC plans will stem the accumulation of further unfunded liabilities.

There are many pros and cons to structural changes in public plans. However, one recent prominent objection to converting public DB plans to CB or DC structures are so-called "transition costs." These transition costs would temporarily raise the cost of supporting public plans, such that savings from reform would be delayed for a number of years. Higher costs in the interim may be seen as problematic, given that rising costs for current DB plans are a primary motivation for pension reforms.

However, it is important to clarify from the outset what is meant by transition costs in the public plans context. The phrase "transition costs" gained prominence in the debate about Social Security personal accounts, which would allow workers to divert a portion of their payroll taxes to defined contribution retirement accounts. Social Security is a "pay-as-you-go" program, meaning that current tax revenues are used to fund current benefit payments. As a result, the diversion of payroll taxes to personal accounts by current workers would deprive the program of a portion of its revenues, raising costs for the program until current workers with accounts began to retire. The higher costs during this period were often referred to as "transition costs."

At first glance, this issue should not arise with public sector pensions, which are – or are intended to be – fully funded. If a public plan is fully funded, that means

[Cash balance] plans allow for portability of benefits and a direct earnings-benefit link, which may be helpful in attracting and retaining quality public employees.

. . . arguments for public plan transition costs have intuitive appeal. But both are based on misunderstandings of public plan accounting and investment practices that, once resolved, show transition costs not to be an impediment to public plan reforms.

that it has sufficient assets on hand to pay for all accumulated obligations. If future contributions instead are directed to CB or DC pension plans, this would have no effect on the ability of the DB program to pay what it owes: neither its assets nor its liabilities have changed.

The issue of transition costs arises in the public sector for different reasons. First, some argue that accounting standards promulgated by the Government Accounting Standards Board (GASB) require that a closed DB plan more quickly pay off – or "amortize" – its unfunded liabilities. Under current practice, plans may amortize unfunded liabilities over a period of up to 30 years. Faster amortization would mean higher payments, thereby raising plan costs over a period of time.

Second, it is argued that a closed DB plan should invest in a safer, more liquid portfolio as its participant population ages. Because safety and liquidity are accompanied by lower expected returns and public plan contributions are based on the expected return on plan investments, this would increase the funding cost of the current DB plan until the last DB participant passed through the system.

Both arguments for public plan transition costs have intuitive appeal. But both are based on misunderstandings of public plan accounting and investment practices that, once resolved, show transition costs not to be an impediment to public plan reforms. Advocates for current DB plans might oppose such reforms for other reasons, but transition costs would not stand in the way of shifting public pension provisions toward CB or DC structures.

As Costrell (2012) shows, claims of "transition costs" have been successfully cited in a number of states as a reason not to enact comprehensive public pension reforms.[2] For instance, Minnesota's three statewide plans published a study claiming that pension reform could generate transition costs of $2.8 billion over 10 years. Laurie Hacking, executive director of the Minnesota Teachers Retirement Association, called transition costs the most important point with regard to pension reforms.[3] Similarly, the National Institute for Retirement Security – an organization representing many public plan stakeholders, such as public employee unions, actuarial firms, investment advisors, and the plans themselves – issued talking points to members stating that "closing a DB pension can incur unfunded liability growth and large transition costs."[4]

Thus, arguments regarding transition costs are not merely academic abstractions. Rather, they have had and continue to have a concrete effect on policy initiatives in states and cities around the country. For successful pension reforms to be enacted, policymakers must understand what transition costs do and do not mean for plan sponsors.

ACCOUNTING-BASED ARGUMENTS

The accounting-based argument is relatively straightforward. It claims that when a public DB pension plan is closed, accounting standards require that the plan sponsor more rapidly amortize the plan's unfunded liabilities. A more rapid amortization schedule, therefore, raises required contributions significantly over a "transition" period. Thus, transition costs.

It helps to begin with background on how most public plans' annual required contributions (ARCs) are calculated. GASB Statement No. 25 (GASB 25) requires that

a plan sponsor calculate an ARC, which consists of two parts: the first is designed to cover the cost of new benefits accruing to employees in that year. This portion is referred to as the "normal cost" of the plan. The second payment is used to pay off unfunded liabilities from prior years, which might arise if the plan failed to make scheduled payments, if investment returns fell short of projections, or if benefit costs were higher than expected.

Plans use many different formulas to pay off unfunded liabilities, which differ in terms of how quickly the liability is paid off and how payments vary from year to year. It is common, however, for plans to pay benefits on a "level dollar" basis, meaning that it repays the same amount each year, or on a "level percent of payroll" basis, which means that amortization payments start small and rise each year at the same rate as employee wages.

Importantly, however, the level percent of payroll option is available only for open plans where

> . . . the wage base continues to grow. Closed plans, where the participant population is shrinking, generally account for amortization costs on a level dollar basis. This shift does not increase the total cost of amortizing unfunded liabilities. Rather, it merely means that initial amortization payments would be higher, and later payments lower, than under the level percent of payroll basis. These higher initial payments are termed the "transition cost."

However, there are a number of objections to the accounting-based argument for transition costs.

Response 1. GASB standards are for disclosure only. GASB statements do not dictate funding requirements and GASB does not have (and makes no pretense to have) the power to enforce how governments choose to fund their plans. This fact should be obvious, given the large number of plan sponsors in recent years that have with impunity failed to make their supposedly "required" contributions, contributions which *include* the amortization costs that transition-cost scare tactics claim are mandatory.

More importantly, jurisdictions that have reformed their pensions, such as Alaska, have maintained their prior amortization schedules. They are free to make precisely the same amortization payments as under the prior benefit plan. As Costrell shows, plan officials and public plan actuaries acknowledged this fact, albeit many times seemingly reluctantly.

However, GASB's 2013 updates to pension accounting standards – termed Statements No. 67 and 68 – should make clear that the organization's standards are for disclosure only. For instance, in a document titled "GASB's New Pension Standards: Setting the Record Straight," GASB addresses the question "Do the new GASB Statements establish requirements for how governments should fund their pensions?" GASB answers:

> No. In the past, the accounting and financial reporting standards were closely associated with the approach that many governments take to funding their benefits—that is, toward contributing sufficient resources to a defined benefit pension plan to finance benefit payments when they come due. Consequently, many governments have established funding policies based on the GASB's standards. However, after reexamining

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> the prior standards for pensions, the GASB concluded that approaches to funding are not necessarily the best approach to accounting for and reporting pension benefits. Therefore, the new Statements mark a definitive separation of accounting and financial reporting from funding.[5]

GASB goes on to reiterate that

> . . . the new pension Statements relate only to accounting and financial reporting, or how pension costs and obligations are measured and reported in external financial reports. How much governments actually contribute each year to a pension plan is a policy issue. Governments will likely report pension expense more quickly than under the prior standards; however, how or whether this information is used in assessing the amounts that governments will contribute to their pension plans is a public policy decision made by government officials.

Simply put, despite claims that GASB "requires" higher amortization payments from closed DB plans, the opposite is the case: GASB standards do not make any funding requirements. Funding is a policy decision. Proponents of the accounting-based transition costs argument make no policy argument why amortization payments should increase.

Response 2. It is very unlikely that ratings agencies or bond markets would punish a jurisdiction that enacted major pension reforms, even if it failed to make higher amortization payments.

Let's assume that GASB standards do require higher amortization payments when a DB pension is closed. And let's assume that the sponsoring government chose not to make those payments, judging the "transition costs" to be unaffordable. If that happened, what would be the cost to the government or taxpayers?

The answer: probably nothing. Bond rating agencies and financial markets should punish governments that commit financially irresponsible acts. These include, as the rating agency Moody's recently pointed out, accumulating large unfunded pension liabilities. Indeed, Moody's declared that it will no longer accept GASB figures as part of its calculations of public plan liabilities, arguing that these figures understate the true value of public plan liabilities.

Most governments considering a shift to defined contribution or cash balance plans do so as a means to control annual costs and prevent the accumulation of unfunded pension liabilities. It is difficult to understand why either rating agencies or financial markets would look askance at governments that enacted such reforms, even if these reforms included a technical underpayment of a non-binding accounting disclosure. If a pension reform improves the sponsor's financial standing in terms of economic substance, governments enacting such reforms could reasonably be expected to be rewarded with higher bond ratings and lower interest rates on bond issues.

Response 3. More rapid amortization payments would reduce the accumulation of public debt, improving fiscal health and potentially lowering debt service costs. This result comes about through a difference in the interest rate used to calculate pension liabilities and the interest rate on municipal bonds.

Most governments considering a shift to defined contribution or cash balance plans do so as a means to control annual costs and prevent the accumulation of unfunded pension liabilities.

Public plans calculate their liabilities using the expected return on the plan's investments, which is usually about 8 percent. Amortization payments, whether on a level percent or level dollar basis, are calculated using those same interest rates. Almost all economists, along with a number of government agencies and the rating agency Moody's, think this practice is wrong and understates public plan liabilities. But this argument, while important in other contexts, does not make much difference here.

What does matter, however, is that the expected return on public plan assets is significantly higher than the interest rates paid on government bonds, which reflects the cost of capital to state and local governments. This difference means that faster amortization not only repays public plan debts more quickly, it lowers their overall cost. An example illustrates this point.

Imagine a plan that had $1 million in unfunded pension liabilities, as calculated using the plan's 8 percent expected return on investment and that it planned on amortizing them over a 30-year period. If we assume that plan payroll rises by 4 percent annually, on a level-payroll basis, the plan could begin with a payment of $55,606 in year 1, rising to $57,830 in year 2, and so on. If the plan instead amortized on a level-dollar basis, payments would begin in year 1 at $82,248 and remain at that level thereafter.

Now, let's assume that the government borrows all the money it needs to make these amortization payments and must pay 4 percent interest on its borrowing. At the end of 30 years, the plan would have built up about $5.4 million in total debt under the level percent of payroll amortization schedule. Using the level-dollar schedule, however, the government would amass only $4.8 million in debt over the full period, a reduction of about 11 percent.

In substance, it does not matter whether the government actually borrows or not. The interest rate on government bonds is simply a measure of the sponsor's cost of capital and of the opportunity cost of spending or saving at a given time. But this example shows that the so-called "transition costs" claimed by reform opponents would, in reality, significantly reduce total public pension outlays.

Response 4: If a DC or CB plan was created as a new tier within the existing DB plan, even GASB standards would not imply higher amortization payments.

The GASB guidelines that dictate whether plans can report amortization on a level-dollar or level-payroll basis make this distinction based upon the *number* and *wages* of employees enrolled in the plan, not based upon whether all plan members have identical contribution and benefit provisions. A reformed plan could be created as a new "tier" within the existing DB plan. This would keep the DB plan open, maintain the plan's total payroll base, and therefore not trigger GASB amortization standards.

Many existing DB plans have multiple tiers, in which newly hired employees pay higher contributions or receive less generous benefits than older employees in previous tiers. New tiers are ways to alter the terms of the benefit agreement for new employees without creating an entirely new plan. There appears to be no reason that a reformed pension plan could not form a tier under the existing public employee pension system.

This is particularly true for CB plans, which are legally and substantively another form

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of DB plans. The benefit formula for the new tier would simply state that benefits are based on accumulated contributions plus credited interest rather than being calculated as some percentage of final salary. But there is reason to believe that a DC plan could be created as a new tier as well. Utah now offers a Tier II that gives new hires the choice between a DC pension and a DB plan.

Similarly, Alaska shifted new hires to DC pensions but continues to calculate amortization payments based upon total employee payroll. The key requirement appears to be that employers participating in the new plan – meaning, government agencies or sub-divisions of government – would continue to pay their share of amortization costs based on *total* employee payroll, including new employees participating in the DC plan.

Response 5. There is no economic or policy reason to alter amortization schedules; the government as a whole owes pension liabilities and neither government resources nor total employee payroll has changed.

As noted earlier, unfunded pension liabilities are essentially a government debt, representing benefits owed to retirees from prior service. The government backs the debt and in almost all cases must be paid, regardless of how well funded the plan is or how current workers are earning new benefits for their current service. Converting current or newly hired employees to a different plan does not change the size of current benefit liabilities, nor the dates on which these benefits must be repaid. The government must decide for itself the best way in which to honor its benefit obligations, but the fact that new obligations are being earned in a different type of pension plan does not change those calculations.

Amortization payments are often calculated as a percentage of employee payroll, and as payroll shrinks, these payments would appear to rise. But this is an illusion: amortization payments are almost never charged to employees, so expressing them as a percentage of employee payroll is a matter of convenience. In nearly all cases, the plan sponsor — the government — makes all the payments for unfunded liabilities, and what matters to the sponsor is the dollar value of such payments.

If the sponsor had an appropriate amortization schedule pre-reform, that schedule is likely to remain good post-reform. Nothing of economic or policy substance has changed.

In summary, there is no pretense that there is an economic or policy reason for the sponsors of a closed DB plan to amortize unfunded liabilities more rapidly. Rather, accounting-based transition cost arguments are based merely upon technicalities of GASB accounting guidelines. But an accurate and up-to-date reading of GASB guidelines shows that even these technicalities do not actually apply. Thus, there is no accounting reason why reforms that close DB plans and enroll public employees in alternate pension structures should not be on the table.

INVESTMENT-BASED ARGUMENTS

There is a second and more recent claim regarding pension transition costs that has nothing to do with accounting rules or amortization of unfunded liabilities. Rather, the claim is based upon how a closed DB plan might change its investment strategy and how such changes would affect the cost of the plan.

The investment-based transition costs argument is that a closed plan with an older participant population must shift to a less risky and more liquid portfolio of investments to ensure that it has sufficient funds on hand to make benefit payments as they are due. An open-ended plan, it is argued, can rely on a more aggressive portfolio and thus reap the rewards of higher expected investment returns. Shifting to a lower-returning portfolio would increase the plan's liabilities, because, under GASB's (controversial) accounting standards, liabilities are calculated using the interest rate that is assumed for plan investments. Higher liabilities would increase the plan's unfunded liabilities and thereby raise the amortization payments needed to restore the plan's finances to balance.

Even as the accounting-based argument for transition costs has been discredited, this investment-based argument is becoming increasingly common. For instance, a study by the California Public Employee Retirement System (CalPERS) states that:

> As a closed DB plan ages, fewer contributions due to fewer active members, relative to retiree benefit payments, increases the need for more liquid assets. This creates a need to shift assets to investments that have a more predictable cash flow such as bonds. This generally has a negative impact on the fund and results in lower investment income. This lost investment income needs to be covered by additional contributions. These contributions may come from the employer, the employee or a combination of both.

Similarly, the actuarial firm Milliman argued that a closed plan should alter its investments and, based on GASB accounting rules, the discount rate it applies to its liabilities. In a letter to the Pennsylvania Public Employee Retirement Commission (PERC), the firm's actuaries said:

> [O]nce active membership in SERS and PSERS has significantly declined and retired members are the majority of each System's total membership, the Systems' should consider revising their investment policy. Each system may be inclined to invest assets in a more conservative manner resulting in a lower discount rate than current levels. This revision would result in a lower valuation interest rate, which would result in higher actuarial accrued liabilities.[6]

In a study regarding the Florida Retirement System, Milliman similarly argued with regard to reform proposals in Florida that:

> Over time, the State Board of Administration may lose the ability to invest with a long-term perspective as annual cash flow becomes more and more negative. Under a closed plan, as the active population shrinks and the retired population continues to grow, benefit payments will exceed the contributions made to the plan by continually increasing amounts. This will possibly necessitate future changes in asset allocation in order to provide sufficient sources of cash for benefit payments, which in turn could impact the rates of return earned by the Fund's assets...thereby putting upward pressure on costs.[7]

Likewise, the three Minnesota statewide retirement plans published a joint analysis of a potential conversion to DC plans. The authors state that:

. . . unfunded pension liabilities are essentially a government debt, representing benefits owed to retirees from prior service.

Once investment risk is accounted for – as it must be in any rational analysis of the economic costs of different policy approaches – the supposed costs of a lower-risk financing strategy disappear.

> Relative to an open ongoing DB plan, a closed DB requires higher cash outflow, meaning benefit payouts are high relative to contribution revenue. As a result, plan assets will be spent down and thus, must be invested in a lower risk investment allocation. The financial impact of these investment allocation changes would be significant and are not included in the cost estimates. Mercer estimates that if the investment earnings and interest assumption for the closed DB were lowered from 8.5 percent to 6 percent to reflect a more conservative asset allocation, the actuarial accrued liabilities would increase by approximately 30 to 40 percent and the unfunded actuarial accrued liabilities would more than double.[8]

Such calculations understandably make policymakers reticent to consider reforms that would close existing DB plans.

But these arguments come from a philosophical standpoint that holds that public pensions need not account for the risk of their investments. Once investment risk is accounted for – as it must be in any rational analysis of the economic costs of different policy approaches – the supposed costs of a lower-risk financing strategy disappear.

Response 1. There is no evidence that U.S. public plans currently target their investment portfolios to the age structure of their participant populations. Thus, the transition costs argument proposes a standard that public employee systems do not themselves follow.

Economists believe that a DB pension should tailor its investment portfolio to the characteristics of its employee population in order to "hedge" the risks that the plan faces in paying benefits. In this regard, active employees and retirees are somewhat different. Today's employees will earn benefits based upon their final earnings, meaning that the future value of these liabilities depends upon the growth rate of wages. If wages grow more quickly, for instance, future benefits will be higher. Over very long periods, stock returns tend to be correlated with the growth of wages. Thus, plans can hedge this risk in part by holding stocks in their investment portfolios.

Benefits owed to current retirees, however, have already been determined and do not vary with wage growth. These benefits are easily calculated and relatively stable over time, making them more "bond-like." Thus, a plan with a greater number of retirees could hedge these risks by holding more bonds.

None of this is to say any public plans should necessarily invest *heavily* in stocks. Both benefits for current workers and for current retirees are intended to be guaranteed, so a plan looking to "immunize" future taxpayers against unfunded liabilities would remain predominantly invested in safe assets such as bonds.[9] However, "younger" plans with greater numbers of active employees should hold more stocks than "older" plans.[10]

Research has shown that U.S. private sector pensions and public sector plans in Canada, the U.K., and the Netherlands follow these practices. As these plans mature, meaning that retirees make up a larger portion of their participants, they shift toward safer investments such as bonds. For instance, Andonov, Bauer, and Cremers (2013) show that for funds *other* than U.S. public plans, a 10 percent increase in the percentage of retired members is associated with a 1.2 percentage

point reduction in the plan's portfolio allocation to risky assets.[11]

However, there is no evidence that U.S. public plans follow the same approach. Rather, U.S. public plans have been taking *more* investment risk as they age, which is contrary to economic theory and good investment practice. For U.S. public pensions, a 10 percent increase in the percentage of retired members is associated with a 2.1 percentage point *increase* in the allocation to risky assets.

The difference, Andonov, Bauer, and Cremers (2013) suggest, derives from the unique accounting standards for U.S. public plans. In the U.S. private sector and for public employee plans in other countries, benefit liabilities must be valued (or "discounted") using a low interest rate to reflect the fact that these benefits are guaranteed. The discount rate used to value these liabilities usually is derived from government bonds or investment-grade corporate bonds. Importantly, the discount rate has nothing to do with the actual investment portfolio the plan holds: a private plan or overseas public plan does not alter how it values its liabilities when it changes its investments. Thus, these plans have the incentive to adopt the investment portfolio that best suits their needs, not a portfolio based on accounting rules.

However, as noted earlier, GASB standards allow U.S. public plans to discount liabilities using their assumed return on plan investments, usually about 8 percent. Using an 8 percent return rather than, say, a 4 percent yield from government bonds reduces measured plan liabilities by approximately half. The incentives for U.S. public plans to take excessive investment risk are obvious, and indeed the data show that U.S. public plans take substantially more investment risk than private pensions or public plans overseas.

Thus, while the investment-based, transitions-cost argument has merit, its practical effects are vastly exaggerated. The financial effects of closing a plan should be measured using an appropriate portfolio for a closed plan and an appropriate portfolio for an open plan. Comparing the expected returns on an *appropriate* portfolio for a closed plan with the *inappropriately* risky portfolios that open U.S. public plans currently choose is misleading.

Response 2. Under a "fair market valuation approach," the effect on liabilities of a plan's closure would be modest.

The so-called fair market valuation approach is favored by most professional economists and endorsed or adopted by government agencies such as the Congressional Budget Office,[12] the Bureau of Economic Analysis,[13] and the Federal Reserve.[14] Using it, public plans would value their liabilities using discount rates derived from low-risk investments such as government bonds.

The Fed's director of research and statistics, David W. Wilcox, summarized the case for market valuation:

> These [public pension benefits] happen to be really simple cash flows to value. They're free of credit risk. There's only one conceptually right answer to how you discount those cash flows. You use discount rates that are free of credit risk. This is one of those things where it just really is that simple.[15]

In 2013, the National Income and Product Accounts, which are the official ledger books of the United States economy, began measuring public pension liabilities using

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a market-based measure that captures the full economic cost of offering guaranteed pension benefits. These risk-adjusted figures now are published in the Federal Reserve's Flow of Funds Accounts, allowing the public a more accurate view of public pension funding adequacy.

But the market valuation approach also has importance for potential conversions of public employees from existing DB plans to CB or DC pensions.

For an open pension plan, the mid-point of the plan's liabilities usually lies around 15 years in the future, meaning that half of payments take place prior to 15 years and half after that time. Thus, we can approximate the discount rate for the pension's full series of benefit payments by looking at yields on safe investments with a duration of about 15 years. However, when a plan closes, the duration of the plan's liabilities would gradually shrink and thus a shorter-term discount rate would become appropriate. Because shorter-term investments generally have lower yields, this would lower the discount rate applied to a closed plan and thus raise the value of its liabilities.

However, these differences would be neither immediate nor dramatic, for three reasons. First, the difference in yields on appropriate investments are not that different over short and long durations. For instance, some economists value pension liabilities using the yield on Treasury Inflation Protect Securities (TIPS) to reflect the fact that most public plans offer inflation protection on their benefits.[16] The difference in yields between, say, five- and 20-year securities is only about 1.5 percentage points; between five- and 10-year TIPS, the yield difference is less than 1 percentage point.

Moreover, differences in the discount rate are most important for long-term liabilities, where a higher or lower discount rate compounds upon itself over many years. For instance, for a liability payable 30 years from now, shifting from a 4 percent to a 3 percent discount rate raises the liability's present value by about one-third. But for a liability payable 10 years in the future, a similar 1-percentage point reduction in the discount rate increases the present value by less than 10 percent. For a liability five years in the future, a similar reduction in discount rates raises the present value by less than 5 percent.

Third, discount rates would be lowered for a plan only gradually. If, for instance, a plan were closed to new entrants today, the duration of the plan's liabilities would shorten by a small amount each year and thus the appropriate discount rate would change only slowly. It would be incorrect to immediately assume a much lower discount rate for the plan in next year's valuation because very little about the plan's liabilities had changed.

In sum, under an economically rational valuation system, the difference in discount rates for a closed plan would be modest and the effect on the value of liabilities would be relatively small.

Response 3. Safer investments come with benefits, namely lower risk. Once the "cost of risk" is accounted for, shifting to a more conservative investment portfolio does not raise costs to the taxpayer.

The investment-based, transition-costs argument focuses on one disadvantage of a more conservative investment portfolio – lower returns – while ignoring the benefits of such a portfolio, namely lower risk. Risk has a cost, which is imposed on

plan sponsors (and sometimes employees) through fluctuating contribution rates. A lower-risk portfolio rewards plan sponsors with contribution stability that fully compensates them for any additional contributions they might make.

This can be shown in a straightforward way using financial products known as "options." Public plans offer participants guaranteed benefits, but these benefits are funded with risky assets such as stocks, private equity, and hedge funds. Thus, there is no guarantee that the investment made today will be sufficient to pay the benefit that has been promised. In fact, in most cases, there is a greater than 50 percent chance that even a "fully funded" plan will fall short of being able to pay promised benefits.[17] In these cases, the taxpayer will be called upon to increase contributions to the plan.

Economists sometimes describe such a taxpayer guarantee as an "implicit put option." A put option is a financial product that acts as insurance against low returns on some other investment. For instance, the public plan might purchase a put option that would make up any difference between the actual earnings on its investment and the amount it needs to pay full promised benefits. The purchase of such a put option would make the plan "truly fully funded," meaning that it could guarantee the benefits owed to public employees without any recourse to the taxpayer for additional funds. As it is, the costs of these "contingent liabilities" are shifted to taxpayers, though they are nowhere revealed in accounting disclosures.[18]

Here is the important point: the cost of a put option depends, among other things, upon the risk of the investment it is insuring. It costs a lot more to insure a risky investment than a safe one. So while it might appear that a pension plan could lower its cost by taking more investment risk, the higher expected returns on a risky portfolio are offset by the higher costs of the implicit put option that future taxpayers are unwittingly forced to provide.

Similarly, a plan that takes less investment is not made worse off. A safer portfolio has lower expected returns, but those returns are also much less risky. As a result, there will be less volatility in the pension contribution rates that governments and taxpayers must pay. Contribution volatility is important: because stock prices are correlated with the state of the economy, pension contribution rates will tend to rise at exactly the wrong time, when the economy is weak, tax revenues are low, and taxpayers' incomes have fallen.

Thus, while a closed plan might choose to hold safe, lower-returning assets, the cost of the implicit put option imposed on future taxpayers falls significantly. In fact, financial theory says that the value of these contingent pension liabilities falls by enough to fully compensate taxpayers for the lower expected return on the pension's investments.[19]

This highlights a broader point regarding the debate about public pension liabilities: the true, full cost of a pension plan is a function of the benefits the plan offers – how generous they are and how safe they are. The true costs of a plan have nothing to do with how the plan sponsor chooses to finance it. Whether a plan sponsor funds its liabilities with smaller contributions in risky, high-returning assets or larger contributions in safer, lower-returning assets is a financing *strategy*, not something that fundamentally alters the cost of the plan. Safe investments

Once the "cost of risk" is accounted for, shifting to a more conservative investment portfolio does not raise costs to the taxpayer.

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have lower expected returns, but also present a smaller risk that taxpayers will be called upon to bail out the plan in the future. Changes to the financing strategy can alter the current contribution to the plan, but only by shifting offsetting costs onto future generations.

Response 3. Part of the investment-based, transition-costs argument is that a closed plan must hold more liquid investments, meaning investments that can easily be sold when needed to in order to pay benefits. Liquidity requirements would limit plans' holdings in "alternative investments" such as hedge funds and private equity, which often have restrictions on quick redemption. This, it is argued, would lower the returns plan investments might earn and thereby increase required contributions.

But liquidity concerns are easily overblown. First, a closed plan's investments must be truly liquid only in the final years before true shutdown, which for many plans could be decades in the future. Moreover, alternatives currently make up only a small portion of most plans' portfolios, and not all alternatives held by public plans are illiquid. Of those that are, plans could easily plan staged withdrawals, given the predictability of benefit payments over time.

Finally, even to the degree that plans did shift out of alternative investments, it is not clear that doing so would reduce the risk-adjusted returns to their investments. A study from economists at the Office of the Comptroller of the Currency, a federal bank regulator, found that alternative investments did not increase the returns that public employee plans earned after adjusting for risk.[20] Plans that held more alternatives had slightly higher average investment returns, with the difference due to high returns on alternatives over a single four-year period. However, these higher average returns were merely compensation for greater volatility of returns year-to-year. The authors state:

> We find that pension plans that invested in alternative assets, regardless of the size of the allocation, had significantly higher standard deviations in their returns over a five-year period relative to other pension plans. Measuring risk-adjusted returns with the Sharpe Ratio, we find no significant differences between pension plans that invested in alternative assets and those that did not.

Public plans' portfolios did not become more "efficient" by holding alternatives, they merely traded higher risk for higher expected returns. Reducing pension investment risk, therefore, would not impose true economic costs on plan sponsors.

Response 4. If stock investments are truly low-risk over the long term, as many public plan stakeholders appear to believe, the sponsoring government could grant a closed plan a line of credit to ensure payment of benefits when needed. The closed plan could retain an equity-heavy portfolio, which would repay the plan sponsor over time.

Many public pension stakeholders argue that, over the long term, plans' holdings in stocks and other high-returning investments carry little risk. To be clear, this belief is due to a misunderstanding of how equity risk evolves over time. The standard deviation of annual returns is a common measure of investment risk, and the standard deviation does decline as the holding period is extended. However, this lower standard deviation of annual

returns is trumped by the effects of being compounded over a larger number of years.

For instance, assume a pension investment portfolio with a mean return of 8 percent and standard deviation of 12 percent. Over a one-year period, an investor who received a return one standard deviation below the mean (that is, 8% - 12% = -4%) would end with assets worth 11 percent less than an investor who received the mean return. Over 10 years, the standard deviation of that portfolio falls to 3.8 percent, seemingly making the investments appear low-risk. But an investor who received 10-year returns one standard deviation below the mean would receive 41 percent end wealth than an average-return investor. Put another way, while the standard deviation of annual returns falls over long holding periods, the standard deviation of actual asset values increases. And it is the actual value of the plan's assets, not its annualized returns, which are used to pay benefits.

Nevertheless, many plan stakeholders appear wedded to the notion that investment risks eventually disappear for infinitely lived government institutions. If so, however, this presents an obvious "solution" to so-called investment-based transition costs. The closed plan would continue to hold its current equity-heavy portfolio, which would fluctuate in value over time. If the portfolio proved insufficient to pay benefits or fell below some specified level, the plan sponsor (the government) would supplement the fund as needed. Assuming the fund earned its projected return, it could eventually repay this line of credit with interest. While this repayment period might extend beyond the life of plan participants, if long-term stock investments are as low-risk as many plan stakeholders appear to believe, then repayment is practically assured.

Some might protest that such a line of credit inappropriately mixes the finances of the pension plan and its sponsor, which in certain respects are legally distinct. But the principal legal issue is that pension assets constitute a trust which may be used only for the benefit of plan participants, not siphoned off for other purposes. However, there is nothing prohibiting a line of credit from a plan sponsor to a closed plan. Moreover, such a line of credit does nothing more than formalize legal obligations that already exist. While plan assets may only be used to pay benefits or fund other plan purposes, the sponsor's obligation to pay benefits exists regardless of whether the fund itself is solvent. Governments nationwide already are making supplementary contributions to underfunded public plans. This line of credit approach would simply formalize a legal and practical structure that is already in place.

OTHER CONCERNS

Some argue that converting public employees to DC plans does not reduce unfunded liabilities. Combined with transition costs, this could permanently worsen pension liabilities. For instance, Gary Findlay, the executive director of the Missouri State Employee Retirement System (MOSERS), has written:

> It is well documented that participants in [DC] plans have nowhere near the amount that will be needed to provide anything close to a subsistence level of retirement income. The difference between what participants accumulate and what they need to survive is an unfunded liability that is going to fall on someone. Assuming the employers he mentioned have not determined a method for completely avoiding taxation, they will ultimately be on the hook for the financing of entitlement

Reducing pension investment risk . . . would not impose true economic costs on plan sponsors.

In Missouri, for instance, an average full-career state government employee retiring today would receive almost $24,000 annually in pension benefits, based upon the Missouri State Employee Retirement System's annual report, plus another $13,000 or so in Social Security benefits.

> programs needed to fill the gap. By any reasonable assessment, that is an unfunded liability.[21]

To begin, it is worth noting that academic research is mixed with regard to whether Americans face a crisis in saving for retirement. Some studies, such as the Retirement Risk Index published by the Center for Retirement Research at Boston College, find that a significant percentage of Americans are under saving by a significant amount. But other research finds a smaller and more manageable problem. For instance, Bruce Meyer, of the University of Chicago, and James Sullivan, of Notre Dame, use Consumer Expenditure Survey to show that as few as 4 percent of current seniors consume goods and services worth less than the government poverty threshold.[22] Likewise, John Karl Scholz, of the University of Wisconsin, and his co-authors find that about three-quarters of near-retirees have adequate savings to maintain their lifestyle in retirement and that savings shortfalls, where they occur, are not dramatic.[23] They conclude that "we see little… that leads us to think that households are making large, systematic errors in their financial preparation for preparation."

More importantly, however, is that Findlay mis-uses the word "liability." The *Oxford English Dictionary* defines "liability" as "the state of being responsible for something, especially by law," a definition that matches common usage of the word. For instance, a public pension plan is *liable* for the benefits it owes and must pay those benefits regardless of the level of assets it has on hand. By contrast, Social Security does *not* have liabilities. Under law, when the Social Security trust fund becomes exhausted, the plan will cut benefits to the level payable using current tax revenues. Thus, Social Security's actuaries and trustees refer to the program's "obligations," but specifically and deliberately do not refer to these as liabilities.

If the amounts that Social Security has promised are not liabilities, it is difficult to interpret personal savings shortfalls – in which a given person has under-saved for his or her own retirement needs – as a liability. This under saving is not a liability for the person involved, as she cannot be compelled to do or pay anything in response to it, nor is it a liability for any other party.

One might argue that if public pensions were reduced, the lower incomes of retired public employees would cause them to rely on public assistance, thereby transferring costs to the government. These payments would not be, of course, liabilities, but more important is that these payments are unlikely to be significant in any case. Full-career public employees in most states retire with benefits far exceeding any level at which public assistance would be payable. In Missouri, for instance, an average full-career state government employee retiring today would receive almost $24,000 annually in pension benefits, based upon the Missouri State Employee Retirement System's annual report, plus another $13,000 or so in Social Security benefits. Based upon U.S. Census data, such a public employee would have a retirement income greater than about 83 percent of new retirees in Missouri.

CONCLUSIONS

Public employee pensions in many cities and states require reform, both to maintain financing health and to better serve both

the employers who sponsor them and the employees and retirees who participate in them. While incremental reforms have taken place, policymakers in a number of states and localities have considered structural reforms that would shift public employees to cash balance or defined contribution pension plans.

However, concerns about so-called "transition costs" have held back reforms. These transition costs can derive from accounting standards, in particular, a perceived requirement that closed DB plans amortize unfunded liabilities more rapidly, or due to a closed plan choosing a safer and more liquid investment portfolio with lower expected rates of return. Both types of transition costs would potentially increase the costs of a reformed plan, undermining the goal of pension reform to reduce costs.

However, claims of transition costs are, at some times, overstated and, at other times, entirely mistaken. A closed DB plan most likely would choose a lower-risk investment portfolio, but differences between an appropriate portfolio for a closed plan and that for an ongoing system are exaggerated by the excessive risk-taking of most public DB plans. Using appropriate portfolios for each – or, alternately, relying upon so-called fair market valuation in which guaranteed public pension liabilities are valued using discount rates from low-risk investments – the effects of plan closure would be only modest and gradual.

Similarly, the claim that GASB accounting rules "require" closed plans to more quickly amortize unfunded liabilities is mistaken. GASB rules never imposed funding requirements on public plans, a fact that GASB made very explicit as part of a 2013 revision to its pension accounting standards. Plan sponsors are free to choose their own amortization schedules, and there is no economic or policy reason that a sponsor should alter its amortization schedule for a closed plan.

There are both pros and cons to structural reforms of public plans, and any cash balance or defined contribution plans proposed for public employees should be carefully designed to provide adequate protections in a cost-efficient manner. But concerns about so-called transition costs are almost entirely mistaken and should not stand in the way of public employee pension reform.

ABOUT THE AUTHOR

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Public employee pensions in many cities and states require reform, both to maintain financing health and to better serve both the employers who sponsor them and the employees and retirees who participate in them.

NOTES

[1] With the exception of unusually high investment returns, for which a bonus interest payment sometimes is credited to CB accounts.

[2] Costrell, Robert M. "'GASB Won't Let Me': A False Objection to Public Pension Reform." Policy Perspective, Laura and John Arnold Foundation, May 2012.

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